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# Implementation of an Archetype Data Set to Reuse Electronic Health Record Data in Clinical Decision Support Systems

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## Abstract

The efficiency and acceptance of clinical decision support systems (CDSS) can increase if they reuse medical data captured during health care delivery. High heterogeneity of the existing legacy data formats has become the main barrier for the reuse of data.

## Keywords:

Decision Support Systems, Clinical; Telemedicine; Electronic Health Records.

## Introduction

Medical insurance companies perform quality assessment of medical treatment in Russia. The results of the quality control influence the payment that a clinic will get for the certain case of treatment. The quality assessment process is a wellformalized process performed by medical experts based on clinical standards and personal experience. However, different interpretation of clinical standards especially in regards of optional medical procedures add bias to the process. To avoid bias and to make the process transparent and independent the task of quality assessment can be delegated to a decision support system [1-6]. However, most of CDSSs still are standalone systems that require import-export routine with HISes. The goal of this paper is to present the development of an archetype based dataset for a CDSS–HIS data exchange.

### Methods

Our study is based on the approach proposed by Marcos et al [7] where archetypes are used as a standardized mechanism for the interaction of a CDSS with an EHR. We used LinkEHR archetype editor to design archetypes. In our project, clinical data in EHR systems was stored in proprietary formats. All the HISes participating in the project provide routines that can import/export XML data with known XML schema. We have transformed this data into the openEHR standard format following the constraints defined in archetypes. To perform this transformation we used LinkEHR studio. Using LinkEHR studio we have defined mapping rules between an EHR data schema and CDSS archetypes. After the mapping has been generated to transform the source data instance into an XML document compliant with the target archetypes.

## Results

We have used archives of treatment cases from 10 clinics in Tomsk, Russia, participating in the pilot project. Each HIS database stores a complete electronic health record for each patient. On the first step, we have reviewed the openEHR archetype repository (Clinical Knowledge Manager (CKM) for the architypes that could be reused in our project. Although, the found archetypes had many of the necessary fields, there still was a need to design new archetypes and to add some of the fields useful for payment information and CDSS purposes like nonconformity, transfer summary and inference coefficients.

## Conclusions

We have defined a set of archetypes to represent concepts for exchanging and analyzing interaction with insurance companies.

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