

# **A Common Conceptual Model and Data Warehouse for Higher Educational Institutes in Finland**

CSC – IT Center for Science Ltd.

# CSC-IT Center for Science



- Founded in 1971
- Connected Finland to the Internet in 1988, provides Internet connections to educational institutes
- Owned by the Ministry of Education
- Operates on a non-profit principle
- Facilities in Espoo, close to Helsinki and Otaniemi campuses
- Operates Cray XT4/XT5 supercomputer
- Provides consulting services and scientific applications
- Staff 180



# RAKETTI-project

## RAKETTI- steering group

**RAKETTI-KOKOA**  
Enterprise  
Architecture

**RAKETTI-OPI**

Student information  
system

Steering group

**RAKETTI-TUTKI**

Research data  
administration

Steering group

**RAKETTI-XDW**

Conceptual model &  
Data warehouse

Steering group

Enterprise  
architecture pilot

Univ. of Helsinki:  
Enterprise  
architecture  
manual

IT  
Benchmarking

OPI-Technology  
expert group

Publications registry

HEI's and Ministry of  
Education:  
conceptual model

OPI-Data  
expert group

Publications  
registry: Citation index

Build of data  
warehouse

OPI-Mobility  
expert group

Publications registry:  
Fields of Science

Data warehouse  
service

OPI-Rules of  
principles expert  
group

Publications registry:  
Content

Publications registry:  
Technology



Started



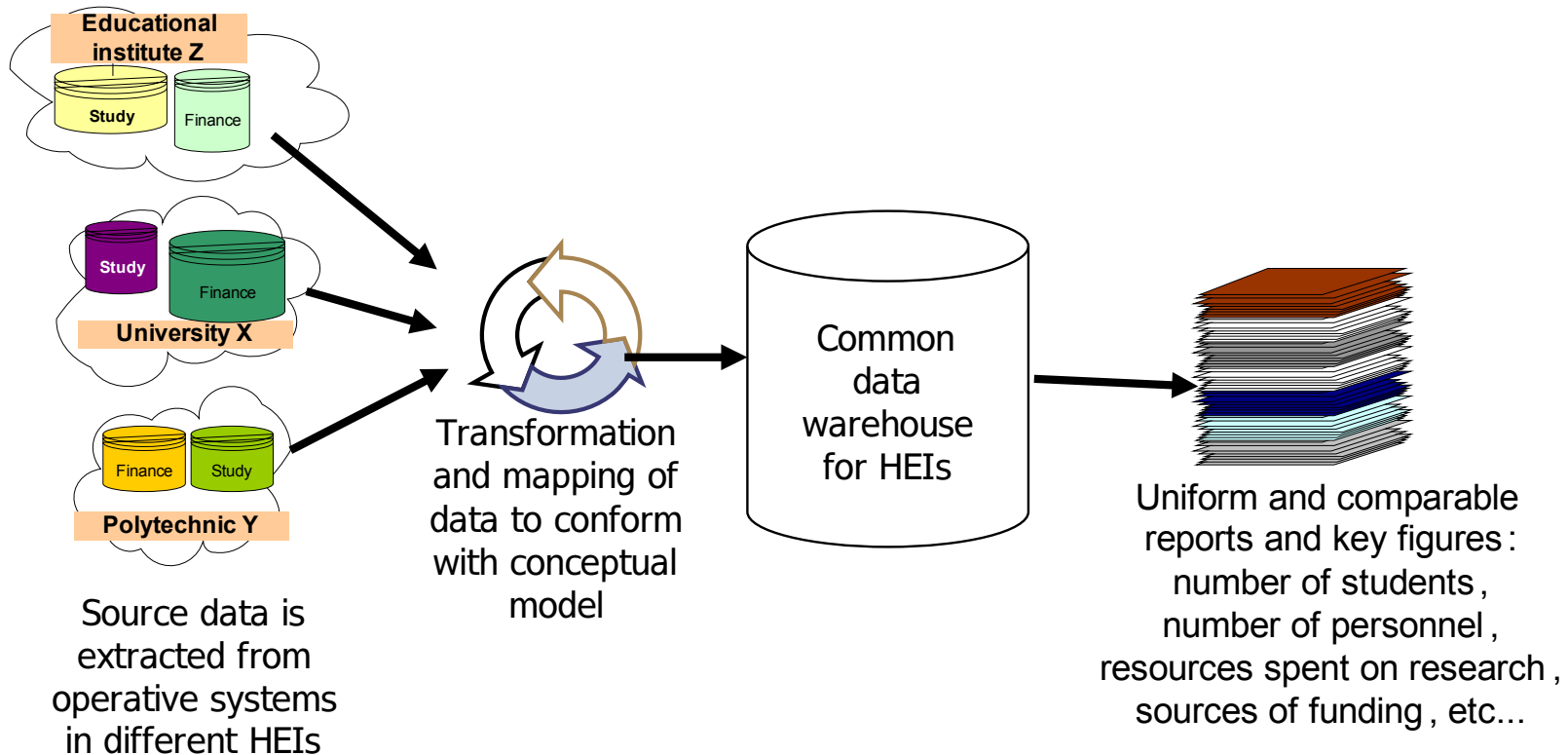
Prepared

# Abstract



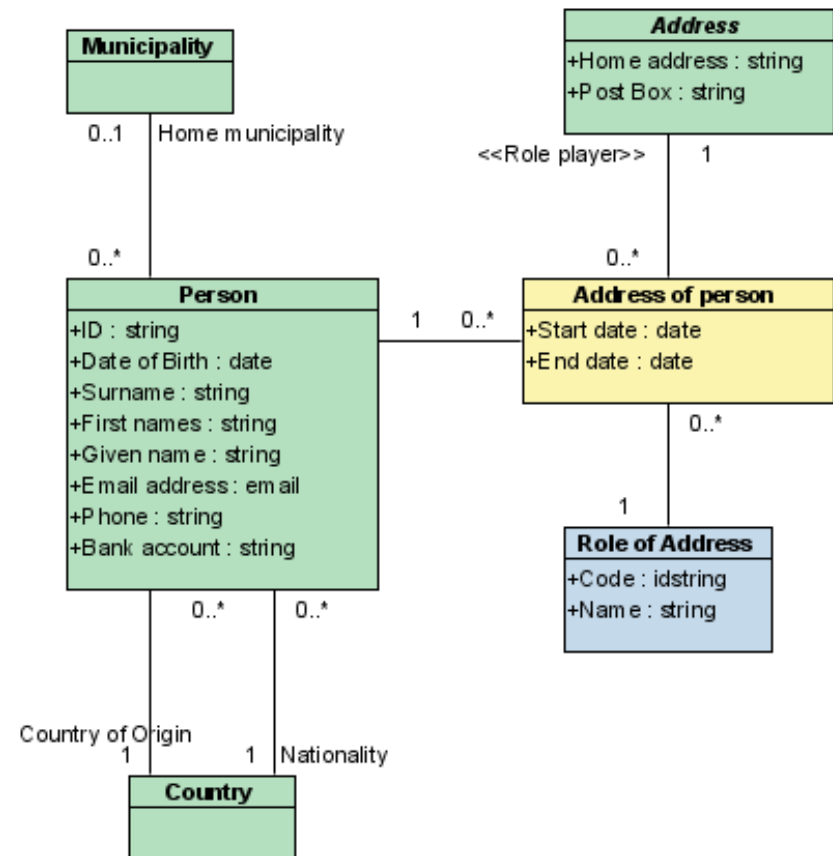
- In order to harmonize the performance data of Finland's over 40 universities and polytechnics, CSC has coordinated the development of a common conceptual model.
- Version 1.0 of the conceptual model, released in February 2010, covers the majority of reporting needs of the HEIs and the Ministry of Education.
- The conceptual model is the foundation of a common data warehousing system of the Finnish HEIs that was launched for pilot users in 2009.

# How it works



# The Conceptual Model

- Contains 350 concepts, their definitions, synonyms, code value examples and code sources, translations, and references to laws.
- Divided into 50 UML class diagrams covering the subject areas of financial management, general management, personnel management, research activities, and study administration.
- Each concept holds a number of attributes that specify properties of the concept.
- Relations between concepts are presented using associations.



# The Data Warehouse



- Specification and design: 2007–2009
- Implementing, testing and operation started late 2009.
- The DW's relational database is automatically generated from the conceptual model using a program built at CSC.
  - Conceptual model uses UML notation and database uses SQL
- Data is extracted from the source systems of the HEIs, then transformed to fit the conceptual model, and finally loaded into the common DW, where it resides in harmonized and comparable format.
- The extraction and transformation phases are source system vendor-specific. In practice, the source systems come from a handful of vendors.
- Extraction and transformation code (SQL, SSIS and other), and other practices used with one HEI and vendor can be utilized with the next HEI who runs a system from the same vendor.
- This dramatically cuts costs and saves time when connecting the next system to the centralized DW in comparison to a situation where every HEI would build their own DW

# More info

- RAKETTI-XDW website (2010). *RAKETTI-XDW-käsitemalli 1.0 (RAKETTI-XDW conceptual model 1.0)*. Retrieved February 10, 2010, from: <https://rakettiwiki.csc.fi/wiki/XDW/WebHome>.
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