ISIT312 – Big Data Management

Conceptual Warehouse Design

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Data warehouse - Conceptual Schema

An objective of this task is to create a conceptual schema of a sample data warehouse domain described below. Read and analyse the following specification of a data warehouse domain.

A group of hospitals would like to create a data warehouse to store information about the medical examinations performed on the patients and later on to analyse the contents of a data warehouse. It is expected that the planned data warehouse will contain historical information collected over a long period of time.

Data warehouse - Conceptual Schema

A data warehouse supposed to contain information about the medical examinations, patients, medical staff conducting medical examinations and including nurses and

doctors, hospitals, cities and countries the patients come from and hospitals are located at, and locations of medical examinations.

The patients are described by a medical insurance number, first name, last name, data of birth and address. A medical insurance number identifies each patient. An address

consists of building number, street name, city, and country.

Data warehouse - Conceptual Schema

The medical examinations are performed in the hospitals. A hospital is identified by its unique name, and described by city and country it is located at. A medical examination is performed in a medical examination room. A room number, building level, and building number describe a medical examination room.

A medical staff member is described be an employee number, first name, last name, and data of birth. A medical staff member belongs to one of the hospitals. A medical staff member is either a nurse or a doctor. Nurses are additionally described by qualifications and doctors are described by a specialization.

Data warehouse - Conceptual Schema

A medical examination may involve an external medical expert whose role is to provide an independent opinion. An external medical expert is described by a title, first name, last name and a name of organization he/she belongs to.

A medical examination is described by date and time when performed and the measurement of the parameters like weight, blood pressure, cholesterol levels, and the

others (please insert at least two other measurements of your choice).

Data warehouse - Conceptual Schema

A data warehouse must be designed such it would be possible to easily implement the following classes of applications.

1) *Find the total number of medical examinations performed per year, per month and per day, per patient, per nurse, per doctor, per external expert who participated in the examinations, per hospital, per city, per country, etc. For example, it should be to find the total number of medical examinations performed in each month of 2017 in each hospital.*

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2) *Find the aggregations of the measures obtained from the medical examinations per year, per month and per day, per patient, per nurse, per doctor, per external expert who participated in the examinations, per hospital, per city, per country, etc. For example, it should be possible to find an average blood pressure of all patients older than 70 per last 12 months.*

Data warehouse - Conceptual Schema

To create a conceptual schema of a sample data warehouse domain follow the steps listed below.

Step 1: Find a fact entity, find the measures describing a fact entity.

Step 2: Find the dimensions.

Step 3: Find the hierarchies over the dimensions.

Step 4: Find the descriptions (attributes) of all entity types.

Step 5: Draw a conceptual schema.

Data warehouse - Conceptual Schema

To draw a conceptual schema, use a graphical notation explained to you in a presentation 11 Conceptual Data Warehouse Design. To draw your diagram, you must use UMLet diagram drawing tool and apply a "Conceptual modelling" notation, Selection of a drawing notation is available in the right upper corner of the main menu of UMLet diagram drawing tool.