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The Data Model for Social Welfare in Finland

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Abstract. A client data model for social welfare was gradually developed in the National Project of IT in Social Services in Finland. The client data model describes the nationally uniformed data structures and relationships between the data elements needed in production of social services. It contains the structures of social care client records, unique core components and distinct classifications. The modeling method guaranteed the coverage, integrity, flexibility and device independency of the model. The model is maintained and developed by the National Institute for Health and Welfare (THL) together with the social workers and other experts of social welfare. It forms the basis of the electronic information management of the social services. Implementation of the data model in information systems enables the availability of the client data where and when ever a client has to be helped.

Keywords. Data model, client data, client record, social welfare

Introduction

A client of social services may use different human services in various agencies. Every agency records the client data of its own. Often the identical data is saved in several local repositories. The stored data of the client, his needs and the services should be available where and when ever he's been helped. In order to share client data between the agencies interoperability of information systems is needed. [1, 2]

In the last decade political initiatives in promoting interoperability among public administrations has been taken in Europe [3]. In Finland the interoperability between the systems used in the public services is patterned after an overall enterprise architecture concept [4]. Information architecture is one of the four fields of the enterprise architecture framework. It contains standardization of terminologies and data structures etc.

There are no international or widely recognized standards focused on social welfare informatics. In order to achieve the interoperability standardization of the contents of the client data used in social welfare is required. Thus a client data model supporting social services processes is at the core of the social services information architecture.

This article presents a modeling process of the client data model and the data model developed for the needs of the social services in Finland. The analysis focuses particularly on the quality properties of the data modeling instead of analysing the actual data model. Traditionally, when the quality assessment has been limited to an existing data model, the errors can be found and fixed afterwards. When the quality has

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been controlled already on the modeling process stage, many errors will be avoided and prevented in advance. [5]

In this article main steps in constructing the client data model and some characteristics of the model are described. Thereafter a structure of the data model is presented and the quality properties of the model are examined considering the appropriate literature. Finally a few outlooks of using the data model are discussed.

1. Methods

The client data model was developed step by step in the National Project of IT in Social Services during 2008-2011 [6, 7]. Data requirements were defined in dialogical teamwork in which both social welfare specialists and information technology experts were involved [8]. As far as is known a similar data model to this extent has never been created in social welfare in Finland nor in other countries. Main stages of the development process of the client data model are presented in Figure 1.

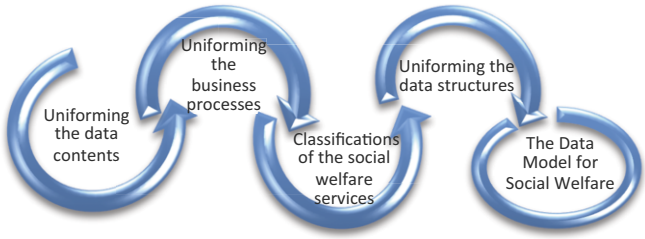

Figure 1. Main stages in developing the client data model for social welfare services.

In Finland, the organizing and delivery of social services are strongly legislated. Despite the regulatory control the ways local governments are organizing and producing various social services differ from each other. The essential characteristics of social welfare, the scope of field and diversity of customer needs brought their own challenges to the development of data model. Due to these challenges generic solutions were sought concerning data specifications. The data contents were defined in such a way that they were usable in as many social services as possible.

Method and guiding principles of modeling evolved when specifications proceeded. When a content of a single specification was developed, the means of description were improving meanwhile. In practice, several specifications became iteratively and incrementally more precise.

Several social services are produced alongside health care services. For example substance abuse services, child and family counseling and disability services employ professionals with social care and health care expertise. Where possible, the national data structures used in health care has been utilized when creating the social welfare client data model. Similarly, other useful recommendations and suitable principles used in public administration are appropriately applied.

The data definitions were based on reports of social services information requirements carried out by the THL in 2006 - 2011. The information needed in the production of every particular social service was described. The examinations were carried out in cooperation with experts and professionals from each field of social

services. The information needs collected could later be used to form the structures of client records and technical specifications. [7, 8]

In order to create a high-quality data model, business processes of the social services have to be understood and described, too [9]. In 2008-2011 target states of social welfare key business processes were described as part of modeling of the national business architecture for social welfare. Particular attention was paid to mechanisms in which the data and structured client records are generated during the client processes. Also the client data transfer between those involved in the process was studied. Cooperation between the process modeling and the data modeling was found to be mutually beneficial, and it improved the quality of all specifications.

Nationally unified and terminologically harmonious classifications describing social welfare functions and social care services were created in 2009-2010 From an information management point of view, the classifications serve as a nationally unified structure for client records, metadata, data retrieval and compilation of statistics.

Options of technical standard and principles of constructing the client documents were examined and evaluated since 2007. Finally, in 2010, the technical specifications were started based on the inventories of social services information requirements. Henceforth generic and shared data requirements and uniform data structures replaced the particular data needs of a specific service as a focus of modeling. Alternative modeling frameworks were studied and finally CCTS model (Core Component Technical Specification) was chosen to ensure the harmonized formation of the components [10].

The client records play a key role when documenting the client information in social welfare. There are for example administrative decisions drawn up by the social welfare authority and documents describing the services provided for a client. In 2010-2012 structures of social welfare electronic client records were modeled for different service tasks, such as social assistance and child protection, as well as for a number of services to support social care processes. The service-specific data descriptions were the key sources of document structures, which were composed of the data components [7, 11].

The first compilation of the social welfare client data model was completed and released in 2011. The client data model is maintained and developed by the THL in close co-operation with the social workers and other experts of social welfare.

2. Results

The literature [12-14] describes a variety of quality-related features of data models, such as the coverage, simplicity and flexibility of the model. In evaluating the coverage of the data model you can study how well the model corresponds to the needs described by the users. When evaluating the simplicity of the data model you focus on how many entities and the relationships between the entities data model includes. The flexibility refers to how well the data model takes into account the needs for change.

The client data model of Finnish social welfare describes the nationally uniformed data structures and relationships between the elements of the data needed when providing social services. It contains structures of over 250 different social care client records, over 150 unique core components and about 100 distinct classifications. [7] An example of the structure of data model is presented in Figure 2.

The client data model can be considered as a logical data model because it captures the requirements of social welfare, but does not take a stand on technical solutions. The model is limited only to describe the data structures of social service user. Thus it does not describe for example data structures used in human resource management or financial management, even if occasionally those have connections with the client data. Thus far no mapping between the data elements of the data model and other data models, such as the UMLS, has been done.

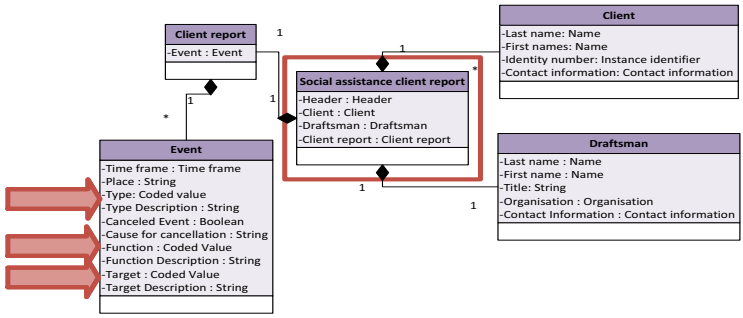

Figure 2. An UML-diagram of a client report as an example of the data model for social welfare.

The coverage of the client data model is almost one hundred percent, but it does not yet cover every field of social services, such as services of employment of persons with disabilities. The data model represents not only the information needs the social workers recognize today but it also tries to capture the information needs of the future.

The selected modeling method of the data components and the records enables the description of a data field name, a data representation, a definition, a note related to the definition, an example, repeatability and mandatority. Diversity of the needs and variety of the circumstances of the social welfare service users make demands on flexibility of the data model. The flexibility can be acquired for example by defining data structures optional and repeatable.

Data modeling gives a formal process to learn how a specific field operates. Also the client data model structures social welfare and helps the communication between different stakeholders. Understandability is defined as the ease with which the data model can be understood. Different stakeholders, such as developers of applications, must be able to understand the model in order to verify if it meets their requirements and to implement it correctly. [14] Understandability of the client data model was increased by means of the terminological work.

3. Discussion

Flexibility is one of the most important quality factors of the data model. It describes how the data model can cope with changes, for instance changes in the legislation. [5] The client data specifications will remain feasible, usable, consistent and up to date by way of a management model. In the model sources of needs to change individual client data specifications have been identified and the client data model management process has been planned. The management model has been gradually introduced.

Before an implementation the quality of the client data model is reviewed by the social workers. The goal of the reviews is to remove unnecessary client document

structures, add missing structures and clarify inaccurately defined structures in the data model. With the help of the reviews it is possible to prevent rework and added cost after the implementation. Also the users will probably be more satisfied. [7]

The implementation of the data model to the operational systems will be taking gradually place when the Finnish social welfare organizations are preparing to use a National Client Data Repository for Social Services [15]. The implementation will need strong support and co-operation of the various stakeholders. Eventually the high-quality data model enables the availability of the client data and lays out the foundation for the information management of the social services [16]. The basis affords also an opportunity to discuss the integration of social and health care delivery [17].

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