Using Business Intelligence and Reporting Tools for Supporting Nursing Leaders in Management of the Nursing Process

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Abstract. The introduction of electronic nursing documentation systems brings the advantage that documented nursing data can, after suitable preparation, be used not only for patient care but also for management purposes. The aim of this project was to develop a reporting and knowledge discovery framework, based on open source tools, which can be used by nursing leaders or hospital managers to monitor nursing documentation, nursing process quality, and explore the knowledge hidden in nursing data. The developed system is tailored to the Tyrolean Federal Hospitals, but the concept should be easily transferrable to other settings. Due to a modular design concept with many reusable components an extension of the system is easy.

Keywords. Nursing Process, Nursing Documentation, Quality Management, Nursing Data Marts, Business Intelligence, Reporting, OLAP

1. Introduction

Nurses are important cost and quality factors in hospitals. For nursing leaders or hospital managers data stored within nursing documentation systems could constitute a rich fund to retrieve information for quality issues and management decisions, but many documentation systems do not provide sufficient possibilities to access this information. Data warehouse approaches can provide a way out of this dilemma [1]. Querying these warehouses directly is difficult as it requires a deep understanding of the underlying data models and structures. Therefore the aim of this work was to develop a reporting and knowledge discovery framework, which can be used to easily access and explore the knowledge hidden in routine nursing data.

2. Methods

The Tyrolean Federal Hospitals Holding (TILAK), where the nursing reporting and knowledge discovery framework was prototyped, runs several hospitals with 2200 beds.

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Nursing documentation and other relevant data is extracted periodically from the documentation systems. After cleaning and quality control steps the data is transformed and loaded to a nursing data mart [2], a small departmental data warehouse for the nursing management board [3]. After requirements and market analyses the BIRT Project, an open source business intelligence and reporting system for web applications based on Java and Java EE, was chosen to build the application system.

3. Results

A web based nursing reporting and knowledge discovery system provides different report types addressing questions concerning documentation quality and quality of the nursing process, e.g.: Does the documentation follow nursing guidelines? Which NANDA-I nursing diagnoses are used in which clinical departments? Which diagnoses are used for which patients? Do the diagnoses reflect the specified problems, risks and resources of the patients? Which nursing interventions are planned for which goals? Which interventions are efficient under which conditions? Filters, e.g., period of admission or documentation entries, organizational units, patient age, gender, diagnoses, pre-existing diseases, living conditions, can be used to display results to specified subgroups. It is possible to stratify results according to various subgroups. The results can further be examined using implemented drill down and drill through functionalities.

4. Discussion

Our aim was to develop an intuitively and easily usable toolkit, supporting nursing leaders and managers in finding relevant and reliable information for management decisions. At the moment the application is used and tested by the TILAK nursing management board. The first emphasis is verifying and checking the documentation quality and compliance with nursing guidelines. The developed system uses only open source tools and is easily extensible. The implementation of additional reports is easy as many components, like basic queries, filters, can be reused following a modular design. Although the framework is tailored to the situation of the Tyrolean Federal Hospitals, the concept should be transferrable to other settings.

References


2 www.eclipse.org/birt