

Rapid Deployment of Physician Order Entry using Web-Based, Disease-Specific Order Sets.

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Abstract

Computerized physician order entry (POE) is a disruptive technology that holds great promise to reduce medical errors and improve workflow. However, Studies have reported significant physician resistance. We embarked on a two-pronged strategy to build broad support for POE: To build a secure, open source, browser-based platform to support POE and create a large number of disease-specific order-sets for immediate use. This presentation will demonstrate the conceptual framework and implementation requirements for such an endeavor.

Introduction

Computerized physician order entry (POE) is a key strategy to reduce medical errors [1]. Structured order sets offer the benefits of reduced errors of omission and improved documentation [2]. They can, however, be wasteful of physician time and a source of discord if not done properly [3]. Reviews of implementation strategies have noted that involvement of clinicians in the development of structured order sets may be the most important contributor to POE success however, implementation may take years [4,5]. The strategic problem then, is how to recruit the clinical care community to develop POE content if the implementation is years away.

Technologic Considerations

We chose to develop our project using open source solutions. Red Hat Linux version 7.2 was selected as our operating system. Zope was chosen as the application server (www.zope.org). The Zope toolbox provides an environment that supports simplified design, development and testing. It is programmable through a standard web-browser. It utilizes the Python programming language; supports object-oriented programming and has its own mark-up language, data-text mark-up language (dtml) and template authoring language (TAL). Complex document printing is performed through LaTeX scripting. MySQL was chosen as the database engine. MySQL is an ODBC compliant SQL database that is open source, has proven stability and has been used in multiple large medical database applications and can connect to decision-support tools such as Stanford's Protégé.

Project Design

A core team established the framework and detailed design for structured order sets that are secure and routable to members of the health care team. The datasets are constructed in a hybrid database (both object-oriented and relational) using LOINC[®] and SNOMED[®] vocabulary. They can be both viewed and edited through a standard browser interface. Health care professionals from various disciplines are then recruited into the project to build content. Initial acceptance and participation has been excellent. By utilizing this approach we have been able to develop and implement a robust set of web-based orders for use by departments within several weeks yet also anticipate the requirements for end-to-end POE platforms developed in the future.

Conclusions

Computerized physician order entry is a disruptive technology requiring extensive participation and buy-in from the clinical community. Our physician community was unwilling to commit significant time and energy into a project that had no tangible benefits until 2006. The web-based POE project allowed us to avoid problems with legacy systems and utilize user-interface designs based on standard browser technology and to have the flexibility of using any number of input devices.

References

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