

Erika Orrick  
User-Centered Design Engineer  
GE Healthcare Integrated IT Solutions, Centricity Practice Solutions

#### Position Paper for the CHI 2006 Workshop on End-User Software Engineering

With the recent federal government push towards pay for performance and other initiatives that lend themselves to eHealthcare, physician interest in electronic medical record (EMR) systems is growing. Currently, less than 20% of ambulatory physician clinics use any type of EMR system. One of the biggest obstacles to adoption is clinician resistance to an interruption in their normal routine. For example, many of the physicians currently practicing were taught to document a patient visit using a “SOAP” (Subjective, Objective, Assessment, Plan) note. Physicians expect to document these observations in longhand, and, more importantly, want to be able to read them back in longhand. Many feel a computer will not be able to accommodate this. In an attempt to address this, MedicalLogic (now part of GE Healthcare) developed a markup/programming language, Medical Expression Language (MEL) that allows users to develop clinical content forms that gather input using standard form elements and generate output in a number of formats including bulleted lists and longhand.

GE Healthcare provides a number of clinical content forms to customers when they purchase the Centricity Physician Office EMR product. The specific forms provided is currently undergoing some revision, but, in general, all customers are provided a generic set of forms that will be used in most practices. These forms include those for recording vital signs, patient histories, etc. Additionally, we produce in-house and resell specialty and condition-specific forms including dermatology and diabetes management as two examples. Each of these forms provides a combination of point-and-click, free text entry, and voice-activated entry for clinicians to document a patient’s condition. The information from these clinical content forms is stored in a database, where it can be referenced more easily than a traditional paper chart, both on an individual patient basis and in aggregate.

Although we sell many forms for customer use, many clinics choose to build and/or customize their own. To accommodate this, we have built an Encounter Form Editor that allows the user to place form elements and write custom MEL functions to gather input and generate output in exactly the way their practice prefers. Unfortunately, our tool has not been substantially updated in several revisions. It lacks the ability for the user to visualize the form they are working on without having to load it into the actual EMR system. Placing and editing individual form elements is an unnecessarily complex process that does not allow the user to see all properties of the element at once. We also do not provide any guidance with common MEL queries that we find many clinicians’ offices use, even though we have easy access to this information on a well-used mailing list. Debugging a MEL function often requires switching between the Editor and the EMR program multiple times. If selected for this workshop, I will be able to bring our Encounter Form Editor as well as several clinical content forms to demonstrate some of these issues.

Information overload and usability on the clinical content forms is a key priority for GE Healthcare this year both for our in-house forms and for those that are developed by our customers and VARs. I think there is a lot to be examined in the tools and processes we provide to them to determine how much of the poor usability of these forms is the end-user programming tools we provide and how much is lack of usability knowledge on the part of the user. There is a great deal to be gained in patient safety and clinician efficiency with the use of EMR systems, but not if we cannot reliably enter the data.