Usability Evaluation of an Integrated Electronic Dental Record System

Sara Engler
Mentored by Amit Acharya, B.D.S, M.S, Ph.D.

Mahnke A, Moritz R, Acharya, A. Biomedical Informatics Research Center, Marshfield Clinic Research Foundation, Marshfield, WI.

Background: Currently, only 1.8% of the dental practices in the United States have adopted Electronic Dental Records (EDR) in their practice. Poor usability is one of the key barriers that prevent adoption. The purpose of this study was to analyze the usability of Marshfield Clinic's Integrated EDR system (CattailsDental) and identify areas for improvement in usability.

Methods: We conducted a task-based usability study with the EDR system. The study participants were composed of two groups; an expert group with Marshfield Clinic dental staff who use the application, and a novice group with staff external to the Marshfield Clinic who had never been exposed to CattailsDental EDR. The user tasks were divided for the hygienist's role in the office and the dentist's role. Each task was assigned a complexity grade and an optimum path by which to complete the task. Participants were also asked to grade the complexity of each task after performing them. Task outcomes were coded by completion status. Participants also completed a System Usability Scale (SUS) survey, net promoter score and product desirability.

Preliminary Results: We identified 22 usability problems. The most frequent usability problems included difficulty finding a specific procedure, identifying when a certain task was complete, and not being able to indicate graphically on the tooth chart exactly what is found in the mouth. Fifty seven percent of the tasks were successfully completed, 7 percent were unsuccessfully completed, 22 percent were successfully completed with assistance, 3 percent were unsuccessfully completed with assistance, and 8 percent were successfully completed through a workaround. The SUS results in the novice group scored their current EDR 67.5 and scored CattailsDental EDR 52.5 out of 100. The expert group scored CattailsDental EDR 73.3. A "usable" score is considered 75 or higher. The net promoter score for CattailsDental EDR across both groups was 33.4 indicating the participants have a low loyalty to the product and are not likely to recommend it to others.

Conclusion: CattailsDental EDR has significant usability problems, especially for novice users. There seems to be a relatively steep learning that often requires workarounds, which decreases the usability of the application.