Wanted: User-friendly System: Usability Testing Evaluates Software through the Eyes of the User

by Kathy Giannangelo, RHIA, CCS

When it comes to human interaction with computer applications, there is a belief that if the system gets the job done, even when the user struggles, then the application works. Susan Dray, PhD, a pioneer in human-computer interaction, begs to differ: "If the user can't use it, it doesn't work."[1]

When healthcare professionals find an application or interface unduly frustrating, they likely will find ways to circumvent the process or revert back to the old way of doing things. If the applications are part of an electronic health record system or involve customized interfaces with other clinical or financial management software, this can mean implementation disasters that can cause system failures.

One remedy to avoid usability problems is usability testing, which is critical to implementation success.

Usability Testing

Usability testing measures the quality of a user's experience. It is achieved by observing the user's behavior as he or she works with an application or interface. Information is gathered on how efficiently, effectively, and satisfactorily the user can perform the intended tasks, such as entering, searching, or submitting data. Usability testing also records user reactions to the software or interface. Testing often addresses questions such as:

- Was the application easy to learn?
- Was the application satisfying or frustrating to use?
- Does the application contain the functionality that the user desires?

The Department of Health and Human Services, for example, considers memorability--whether a healthcare professional who has used a system before remembers enough to use it effectively--as an important usability factor.[2]

Keys to Successful Usability Testing

Usability testing takes place before, during, and after system development, and it is progressive. Results from one round of testing are used to make changes to better meet the users' needs. Testing and redesign are performed multiple times until an acceptable level of usability is identified.

To attain a high level of usability, end users need to be involved in testing. Testing end users on a working application or interface provides system developers with information on how to design the application or interface so that it includes the functionality that the end user needs. Site visits are also key. Site visits provide valuable information about how an end user actually interacts with the system during day-to-day operations. During site visits, the critical features of a user-friendly system, such as the design of user interfaces, queries, and output screens, can be evaluated.

Deterrents to Usability Testing

Usability testing can be expensive, involving specially equipped labs, carefully chosen groups, and experts to do the analysis. Because of the expense and difficulty of this type of testing process, usability tests may not be performed thoroughly or at all.

To promote incorporation of usability as a part of the software procurement process, the National Institute of Standards and Technology was involved in the creation of the Common Industry Format. ANSI/INCITS 354-2001 Common Industry Format

for Usability Test Reports was approved by the American National Standards Institute in 2001 as a standard method for reporting usability test findings. The standard provides a report framework and defines a consistent method for carrying out usability tests.

The standard addresses both "formative" and "summative" usability tests.[3] Formative tests are performed during product development to shape or improve the product, while summative tests are done when development is completed to measure or validate the usability of the application or interface. Formative testing is conducted with the test administrator present. Summative testing is carried out in a usability lab with the participant working alone.

There are informal and therefore more economic ways to ensure system usability. For example, Jakob Nielsen, a Web site design expert, suggests a three-tiered approach that includes scenarios, simplified thinking, and heuristic evaluations as less expensive methods. One of Nielsen's heuristics, or rules, is the need for a match between the system and the real world: "the system should speak the user's language, with words, phrases, and concepts familiar to the user, rather than system-oriented terms," Nielsen writes. Systems should also "follow real-world conventions, making information appear in a natural and logical order."[4]

Check for Usability Testing

An important part of purchasing software applications is determining whether usability testing has been conducted. Healthcare providers should inquire what type of usability testing has been performed and request documentation. Another important question to consider is the degree to which the system can be modified to overcome usability problems and the costs of doing so.

In the end, since it is not possible to know if the application or interface will work until users are actually using it, healthcare professionals who will use the application or interface need to assess the level of usability before deciding on adoption. Usability testing is all about seeing the design through the eyes of the end user. Observing how healthcare professionals use the application in their day-to-day work provides far more valuable information than asking them if they like it or not.

Notes

1. Optimal Usability. "Usability Quotes." Available online at www.optimalusability.com/ quotes.php.
2. Department of Health and Human Services. "Usability Basics." Available online at http://usability.gov/basics/index.html.
3. User Focus. "Standards Update: Usability Test Reporting." Available online at www.userfocus.co.uk/articles/cif.html.
4. Nielsen, Jakob. "Ten Usability Heuristics." Available online at www.useit.com/papers/ heuristic/heuristic_list.html.

References

National Institute of Standards and Technology. "Industry Usability Reporting." July 2005. Available online at http://zing.ncsl.nist.gov/iusr.

Nielsen, Jakob. "Guerrilla HCI: Using Discount Usability Engineering to Penetrate the Intimidation Barrier." 1994. Available online at www.useit.com/papers/guerrilla_hci.html.

University of Maryland. "Testing Methods and Tools." January 12, 1999. Available online at www.otal.umd.edu/guse/testing.html.

Usability First. "Introduction to Usability." Available online at www.usabilityfirst.com/intro/index.txl.

Spool, Jared M. "Seven Common Usability Mistakes." User Interface Engineering. February 15, 2005. Available online at www.uie.com/articles/usability_testing_mistakes.

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