INSIDE EDGE

EHR Usability: In the Eyes of the Beholder

Introduction

Healthcare pundits may have dubbed this as the post-EHR era, but tell that to the increasing number of EHR users across health systems. Usability of the EHR has become a major issue as organizations try to optimize those systems to drive value from the millions of dollars invested during the Meaningful Use era, ensure safety and quality care and extend those systems as a platform for population health. Usability can make or break an EHR platform because it literally shapes the user experience and ultimately determines whether they use it or not.

What exactly is usability? We talked to a CIO at Texas Health Resources, a CTO/CMIO at Mosaic Life Care and experts at the Office of the National Coordinator (ONC). What we found is that when it comes to usability, it depends on your perspective.

First don't impede

"The usability of an EHR is in the eyes of the beholder," says Joey Sudomir, CIO at Arlington, Texas-based Texas Health Resources (THR). Clearly a consensus builder, he shared the question of how to define usability with his CMIO, CNIO, VP of technology and CHIO and got different definitions from each one.

"Of the five people," Sudomir notes, "I'm probably the most removed from having hands-on experience with the EHR tool. That said, usability to me is our ability to insert the EHR into care-delivery workflows to make clinicians feel we are enhancing the ability to deliver care rather than impede it."

THR's chief nursing information officer had a similar take, emphasizing integration of the EHR into the workflow. The CMIO stressed the need for intuitive navigation and, on a change-management level, the need to minimize the number of changes made to the EHR at any given time so users don't feel like they're working with a new system every three-to-six months.

However, the pressure for upgrades is constant. "Fair or unfair, we're now in an app-driven world, so we're going to be compared to a higher standard from the mobile consumer world," says Sudomir. "It's difficult to stay true to the healthcare's regulatory and best-practices requirements. Everybody tries to push out care-delivery enhancements faster than policy can get passed. There's a fine balance between speed and google-like functionality with consistent experience for clinicians."

Shaping perception

Like other health systems, THR's clinicians are normal consumers outside of work. "Think of our own experience. We routinely use and toss apps because we have three to 10 different apps to do a task. Most people have developed the perception that it should be easy to use, so usability is critical because it shapes a person's perception of a tool. It's right below data security as an IT priority," he says.

THR does not employ software "overlays" to make an EHR more usable, but prefers to design usability from the inside out. "The number one tool to increase usability is one from the dawn of time—open dialogue and communication. We have a variety of advisory councils centered around functions like inpatient and ambulatory settings, as well as domain-specific groups, such as nursing and physicians advisory councils, with very high participation and clinician engagement. We take feedback seriously. So, if there's anything that drives us it's involvement with clinicians," says Sudomir.

THR also designs workflows at the system level through a process engrained in feedback from physician leadership. "We have a captured audience, but usability still shapes their experience of the tool—

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Joey Sudomir, CIO, THR

it shapes the emotional experience of physicians in the caregiving process. Usability is a holistic experience that is not easily measured, unlike app developers who can measure the number of people installing or uninstalling an app," he says.

Perhaps, says Sudomir, the best measure is at the macro level. In that sense, THR scores highly, having won the HIMSS Davies Award of Excellence, which recognizes organizations who have utilized health information technology to substantially improve patient outcomes while achieving return on investment. "It's very tough to win the Davies Award if usability is not part of your strategy."

Who is driving?

"Defining usability depends on specific use cases," says Joe Boyce, MD, CTO and CMIO at St. Joseph, Mo.-based Mosaic Life Care.

For example, a provider managing a very complex patient with 20-to-30 variables would likely define usability as making an EHR display as simple as possible yet complex enough to be effective. "It takes a lot of time to be simple," he says, noting that it's about having the right information on the screen, and allowing common actions to be fast and easy.

Aviation, with its complex interplay of data displayed on a cockpit dashboard, is often used for comparison with usability of an EHR. "In medicine we have so many variables and unknowns," says Boyce, "it's difficult to make it as consistent as aviation, especially as independent as providers can be. Commercial aviation has two pilots land at familiar airports in the same model with lots of support and even full automation, but in medicine every patient has many more considerations and handoffs. Also, the plane's complexity is addressed by hundreds of hours of training and simulations—a luxury rarely available in medicine. It's more often: 'This doc is starting next week, get 'em trained.' Google, Facebook, Airbnb, Uber and other app designs do a great job but with limited use cases compared to medicine."

Existing EHRs have not been designed with usability in mind. "What we need is to design it from the ground up, making it web-based and platform independent, with lessons learned to date. You need to have providers working with software engineers who are also experts in design. It gets very difficult to satisfy everyone, especially with the regulatory burden," he says, noting that some EHR vendors are trying to address the usability gap. Cerner's Mpage component allows users to customize much of the layout and presentation layer at Mosaic—but not critical alerts. Those are locked down to avoid "over filtering."

"Good usability makes context easily apparent to the user," Boyce says. "The inherent problem for EHRs is the 80-20 rule: the kidney patient in the ICU on a ventilator for a nephrologist is not the same design as a family med doc looking at the usual outpatient

URI. Those complex edge use cases drive the whole lot of EHR design," says Boyce. He cites the value of websites like www.toomanyclicks.com that tackle the need for intuitive, easy-to-understand-and-navigate EHRs.

Posted by blogger Jeff Belden, MD, a practicing family physician and project leader for "Inspired EHRs: Designing for Clinicians," at the University of Missouri, the website discusses how "discrete data kills a story" about a patient on most EHRs.

Awful result

He uses the example of a typical faxed note from a physician's office that is used in an EHR, "created by clicking on word choices from a list. The lists are designed with an eye toward being able to bill for the actual work done during the visit. The result is awful…I think we physicians need to tell patients' stories, not just collect bullet points for billing. A well-crafted, readable narrative will contain the data to justify the billing," Belden says.

Frustrated with existing EHR graphical displays, Belden designed a more intuitive patient medication timeline inspired by "the beautiful and elegant visual design used by the flight search engine, Hipmunk" (www.hipmunk.com).

Boyce asserts that one way to improve usability is to allow patients via a portal or other means to document their condition to contribute to the EHR highlights of their main problem and issues like medications to avoid duplication. "Many of the narrative usability issues would go away," if patients were allowed to provide their story, he says. "I see many benefits in having a patient as a member of their treatment team in projects like OurNotes, but the bill and habit are hard to overcome."

Joe Boyce, MD, CTO & CMIO, Mosaic Life Care

Incremental changes can go a long way toward improving usability. For example, breaking down medication and problem lists into specialist categories like cardiology and neurology. "Click one button to see all the neurology problems and meds without having to dive down three or four screens. We can do that now, and it's very popular," says Boyce. EHRs are a compromise that tries to cover everything for

everyone and sacrifices usability for some in the process, he says, acknowledging it's easier to quickly make changes at a health system like Mosaic than at an academic medical center and that "there are some dumb designs out there that just need to evolve."

Generally, however, doctors are much more amenable to the EHR. "I've spent more than 20 years working with physicians who were fighting the EHR. In the last three years they now ask, 'Hey, can you do this for me on our EHR?' Our doctors are happy with the EHR overall compared to paper."

Usability from the top

The Office of the National Coordinator for Health Information Technology (ONC) considers EHR usability a formal discipline of study—not necessarily defined the same way by an end-user.

"We talk about two aspects of usability: user-centered design and safety-enhanced design," says Andy Gettinger, MD, CMIO and executive director, Office of Clinical Quality & Safety at ONC. The "cognitive overhead" or display is made up of at least three elements: One, can you see all the relevant information on the screen without scrolling? Two, can you understand the path? Three, is the necessary information there?

Andy Gettinger, MD, CMIO, ONC

"People sometimes conflate usability with other EHR issues," he says. "This isn't about too many clicks. Many of those kinds of issues are not necessarily about usability, but reflect decisions made by the organization, such as every patient we see has to have their blood pressure, weight, pulse, pulse oximeter and height checked on every visit. In some medical settings that is good practice, in others many would argue that it is unnecessary and doesn't improve quality or safety—especially if the patient is being seen daily."

Another factor that's influenced the perception of EHR usability is the industry's tsunami of EHR implementation in the past decade.

"Meaningful Use ushered in a brave new world for everyone," says Rebecca Freeman, PhD, RN, PMP, who serves as CNO at ONC. Meaningful Use drove EHR adoption to 90 percent from only 15 percent

in just a few years. "We had such a quick EHR adoption rate that most implementations defaulted to merely replicating paper records. So, when people talk 'usability,' it's more about poorly defined workflows and documentation. They've replicated a process that doesn't fit well in the automated sphere."

Usability favors youth

Gettinger says there's also the issue of user age. "The first digital divide is based on people's chronological age and experience with technology. Younger users are far more facile with EHRs, even the ones that have not been optimized. That's about the times rather than the design."

> **"One key to a well-designed, highly usable EHR system is a really seasoned informatics staff. Informaticists with knowledge of evidence-based medicine and clinical workflow serve as important translators between the clinical staff and IT-system builders."**

Usability critiques may reflect a larger angst about change. "Medicine as a discipline doesn't change easily or rapidly," he says. "The conversion to EHRs has been very dramatic and it's difficult for people to get used to a new norm. Oh, by the way, I can now easily look across my entire patient population at A1c levels and identify the outliers who need referral to a diabetes coach. So, there are things the EHR brings to the table that are not yet perceived as the benefit they truly are. What am I getting out of the system is almost an afterthought," he says.

Depending on the milieu, poor EHR usability can become a fatal flaw. Gettinger cites a Journal of Pediatrics study on EHR impact in two EDs: one had an increase in mortality; the other did not. The study found the ED with increased mortality had embedded a hard stop in its EHR that required the patient's name before the user could proceed. It disrupted the flow and ultimately impeded care. "That's not how the ED works. That's an example of a well-meaning decision they imposed on the clinical environment. That was defined as usability."

Training is another issue that affects usability. "Nurses get two to three days of EHR training, doctors one day," says Freeman. "You can't learn to use an incredibly complex system in that short a time period. And it's very rare to get follow-up training," which can impair usability of a system. As IT leaders, many Scottsdale Institute member organizations in recent years have invested heavily in training upfront, ongoing and at the elbow. However, poor or inadequate training is still a barrier to usability and optimization.

The Office of the National Coordinator for Health Information Technology

Rebecca Freeman, PhD, RN, CNO, ONC

Two thoughtful discussions on usability on the ONC website can be found at https://www.healthit.gov/buzz-blog/electronic-health-and-medical-records/usability-ehrs-remains-priority-onc/ and https://www.healthit.gov/buzz-blog/uncategorized/usability-success-2/

Conclusion

While EHR usability has been an issue for decades, the huge wave of EHR adoption by health systems in the past five years with the advent of Meaningful Use has brought usability front-and-center as a key factor in ensuring the safety and quality of patient care and the ability to derive value from an EHR investment. A conundrum of usability is how to define it, with definitions varying based on the user's—or even an academic—perspective.

With EHR usability, as in so many other aspects of healthcare IT, people trump technology. "One key to a well-designed, highly usable EHR system," says Freeman, "is a really seasoned informatics staff. Informaticists with knowledge of evidence-based medicine and clinical workflow serve as important translators between the clinical staff and IT-system builders." If usability is, in fact, in the eye of the beholder, then a well-trained clinical and technical translator is just what the doctor ordered.

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