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“Improve usability…but don’t change anything!”
Users may not realize the physical, mental and safety “costs” of sticking to what is most familiar.

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Rethinking how we approach EHR design
Why do EHRs continue to fall short? I think it’s because our industry spends effort on trying to make EHRs usable, instead of making them helpful. It’s why Allscripts is shifting its focus to a Helper Philosophy of user-centered design. Your EHR should be a trusted assistant—a helper.

We need to ask the right questions

Here’s an example of how a Helper Philosophy can change the way we solve problems: Let’s say users are dissatisfied with a complex calendar feature. They ask their vendor for something simpler that quickly identifies openings on the schedule. If designers focus on making the EHR more usable, they might optimize color schemes and reduce the number of clicks needed to schedule an appointment. That’s great but are clinicians happier at the end of the day? Maybe. But probably not.

If designers approach this request with a Helper Philosophy, they might instead ask: What would an assistant do for this person? Can we enable the system to identify open appointments and initiate scheduling with patients? It might mean removing the task entirely from the user or doing most of the work and letting the user make the final choice. These kinds of questions spark innovations that get to the heart of user satisfaction.

Usability is necessary, but it’s not sufficient

The demands of an increasingly complex healthcare environment and elevated requirements related to health IT use are affecting them every day. Studies show that physicians are burning out, which is why the industry has recently been increasingly focused on the clinician experience.

For a long time, the industry has been calling for better EHRs. A recent article in Harvard Business Review points out many of the flaws of today’s EHRs and suggests “…[Artificial Intelligence], vastly improved data visualization, and modern interface design to improve usability.” Usability has been and will continue to be an important part of this conversation, but it’s not sufficient. Neither is applying technology to the problem. We’ve already seen what happens when we just apply technology to healthcare.

To succeed, we need a new philosophy. One where technology, usability and a systems approach focus on how the EHR acts as a helper to the user. Helpfulness should be our new measure of success.

Re-imagining our ideal EHR

A Helper Philosophy covers all design aspects from colors and fonts, to voice recognition, to information visualization and everything in between. A Helper Philosophy rises above these individual tactics and gets to the heart of what our users desire most.

Now picture your ideal EHR as a person. Are they a helpful assistant? One that guides, predicts, warns, plans, remembers and orients you to what you most need to know? Our vision is to go beyond usability and deliver helpful EHRs.
How our HELPER PHILOSOPHY guided the creation of Sunrise Compass

Sunrise™ Compass is a guide, enabling users to quickly orientate to what tasks need to be done now, and what needs to be done later in the context of what they are doing currently. Providers can be more efficient and work with more confidence without relying on memory. Compass is there when users need it, giving the right information at the right time and providing only what is necessary.
But it wasn’t always this way. Previously, the solution had many tools in many locations, giving users too many options and forcing them to poke around the application to find out what they needed to do for all of their patients. And the places they went to in the user interface (UI) did not think of tasks in a consistent way, they were called different things, appeared in different ways, and often tied to a feature or module.

The Allscripts User Experience (UX) team analyzed this situation from many viewpoints and evaluated big-picture questions such as:

- How do users do their work?
- What do users expect?
- How is the current solution supporting those needs?
- What decisions can simplify the user interface?
- What would be the most helpful to the user?

By focusing on the big picture, a few clear action steps emerged:

1) Support users’ ideas of what tasks are
   Messages that travel through the application are always tasks. We removed technical or artificial boxes that these messages were put into, such as having an “email module” and then having “tasks” or “messages” for other items.

2) Bring the tasks to the user
   These tasks have a priority. We consolidated all messages into one area, sorted by priority, and gave users the ability to filter the list. Also, information associated with a task is presented in-line with the message, rather than launching windows and dialogs. This provides a quick view of the tasks that let users see what needs to be done quickly with the right information to prioritize. The other is the inline ability to complete the task with all of the details available. Both contribute to the right information at the right time and can help the users do their jobs more efficiently.

3) Support the provider work model
   It is one thing to put everything in one bucket, but we also needed to support what was going in and when based on how providers do work. Providers are either working on a specific patient, or, are working their tasks for everyone between visits. There is a global module with all tasks, and, a patient-only perspective of the same information presented in the context of the open patient. Shortcuts or Filters allow a provider to work a specific group of tasks (prescriptions) or easily find the priority items across groups.

Analysis indicates that some of these functional changes have removed a week or more of “click time”—time spent clicking, moving the mouse and waiting for info—every year. Providers can spend this time doing other things.

Less time fumbling with tools, more time with patients. Each time we get this right, it is a step toward reducing clinician burden.
IN DEFENSE OF NECESSARY CLICKS

The science behind usability
If there's one thing we know about EHRs, users hate clicks. And for good reason. Clicking and scrolling have historically represented extra time, effort and evidence of not understanding an efficient workflow. Click reduction is often cited as the best way to improve electronic health record (EHR) usability. Our gut instinct tells us that we should do everything we can to reduce clicks.

Yes, unnecessary steps are annoying and should be removed. But we have to be careful that we don’t actually increase cognitive load, hinder decision making and reduce overall efficiency and satisfaction in our zeal to reduce clicks and scrolling. There is a great deal of research available that should guide the design, implementation and customization of EHR interfaces.

In the evidence-based practice of medicine, scientific evidence should also guide Health IT usability decisions. Some of these known facts that come from a solid foundation of research results include:

**Processing fluency**—When users encounter cognitive hurdles caused by poor EHR design, they are more likely to judge the task as more difficult and task performance suffers. So it is important to remove anything that interrupts processing fluency. For example, the date format “10/5/16” requires the user to translate the number 10 into October, whereas “Oct. 5, 2016” is faster for the user to process and is more globally understandable. Removing these processing interruptions will increase overall satisfaction and performance.

**Readability**—The more “readable” text is, the better your comprehension rates will be. Studies have shown that sentence length, contrast, font size and color all play a role in how easily a reader will be able to understand information. Follow best practices, and the user is less likely to experience eye strain, miss important information or waste valuable time.

**Fear of emptiness**—Also known as Horror Vaccui, it’s the idea that people have a natural urge to fill blank spaces. Ironically, the more we fill blank spaces with objects or information, the perceived value decreases.

**Cognitive tax**—When two or more perceptual or cognitive processes are in conflict, it requires additional processing to resolve the conflict, and the additional time and effort have a negative impact on performance. Decision-making research shows us that not only can more information be more cognitively taxing, but it can also lead to suboptimal decisions.

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**Data vs. Instinct—Which will win out in usability decisions?**

The industry recognizes we need to improve EHR usability. Decisions about design and usability should not be based on instincts or “gut feel.” Designers should follow specific guidelines that they all too often ignore in favor of other considerations. For example, using brand colors for text and background on a webpage might fit visual branding standards, but it could create a readability issue if the colors don’t have a good contrast ratio.

There are three main things we should do as an industry that will help advance usability:

1) **Believe the science.** We rely on scientific evidence to guide clinical decisions, we should adhere to the same standards for usability. Rely on data to understand the tradeoffs with every decision. For example, we can get more information on a screen to remove clicks and scrolling but reducing the font size to do it will make reading slower, more difficult and more error-prone.

2) **Participate with and hold vendors accountable.** EHR vendors need honest, consistent input. Work with them and point out trouble spots. Let them know when readability is compromised. Point out unnecessary clicks but recognize that a narrow focus on clicks can mean exchanging one source of pain with another that could be worse for safety and satisfaction.

3) **Be open minded.** Some new interactions may not feel right or familiar at first, but if it’s based on good data it will help improve efficiency, effectiveness and satisfaction. When they’re based on research and best practices for user-centered design, you will likely find that they improve your overall experience with related tasks.

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By embracing these principles, we can steer usability away from “gut feel” and make data-driven, evidence-based design decisions.
In health IT, changes to interaction models, layouts and workflows can mean retraining, which costs money and takes time away from work. There are also concerns that users will be less efficient using something different, or that it will reduce satisfaction.

Many times what we are familiar with is not what is best for us, even though we have adapted to it. Users may not realize the physical, mental and safety “costs” of sticking to what is most familiar.

While familiarity associated with software is often related to steps in a workflow, it can also be familiarity to icons, colors and layouts. Users may not see how a change in color can improve their experience with a product, but color can have a big impact on readability, distraction and cognitive load.

As an example of how familiarity can get in the way of usability, one of our products used bright colors to highlight status on a display board. We found through analysis that a change in colors would have improved the readability and reduced the “cognitive tax” that users pay each time they interact with the display, but the consistent message from clients was, “We’re familiar with it. Don’t change it.”

Balancing usability with familiarity is an important aspect of any design effort. Familiarity is important, but it can’t get in the way of usability and improved performance. Our goal is to create products that support our clients’ needs for safety, efficiency and effectiveness. For solid improvements in these areas, the effort to change is worth it.

Organizations and users in the health IT world desire products with better usability and efficiency, but they hesitate to embrace changes to familiar interfaces and interactions. Humans don’t like change for many reasons.

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Balancing usability with familiarity

How we deal with these competing interests is important. At Allscripts, we try to address this familiarity-usability issue in a number of ways:

• Make sure that change is necessary. All changes should benefit our clients in some way.

• Follow a best-practice user-centered design (UCD) process. We base our designs on understanding the goals of our users and measuring the product with users during development to make sure that the product continues to meet these goals.

• Don’t dismiss familiarity. Understanding our users and their experiences is an important part of our process. The design process benefits from knowing what tools, workflows and interaction models that are familiar to our users (inside and outside of a clinical environment).

• Clearly explain the ROI of making the change. We communicate the measurable benefits of learning a new process, retraining or a short-term loss of efficiency for the more important long-term gains of output, safety and satisfaction.
Many times what we are familiar with is not what is best for us, even though we have adapted to it.
Adherence to user-centered design (UCD) best practices is key to improving electronic health record (EHR) usability. Unfortunately, many EHR vendors skip a crucial step in UCD: formative testing. In this phase, software designers test early versions of the technology with actual users. They’re not testing completed code or solutions ready for market, but rather prototypes, wireframes or even early sketches.

Good formative testing is iterative, meaning designers must gather and address feedback from users several times before finalizing the software. To illustrate how the formative testing process works at Allscripts, here’s a recent example from our Sunrise™ Ambulatory Care solution.

Example: Formative testing for a new task module

The Sunrise team conducted formative usability tests on a newly designed task module with six clinicians. The User Experience team held one-on-one, remote sessions with each participant lasting 60 minutes each. These sessions helped test a set of 10 specific measurable usability goals, such as “100% of users can view and acknowledge results.”

During each session, the moderator asked the participant to complete a series of tasks on a prototype. For example, one task was to find prescription refill requests for a patient and another was to view tasks assigned to the user.

The moderator observed how well participants were able to complete the task, recording reactions and recommendations for improvement. In this case, participants suggested using a different icon for the workflow manager that was more familiar and intuitive. The moderator then summarized the number of tasks completed and qualitative comments and calculated a System Usability Score (SUS) from subjective user data.

Results: Users rate interface as more enjoyable and intuitive

Overall feedback on this prototype was positive. All physicians said they would like to use the new functionality, and they felt the workflow was better than the current functionality.

Key measurable usability goals met or exceeded expectations. On average, users rated the interface 49% more enjoyable, 40% more intuitive, 36% better at giving the right information at the right time, and 70% “newer” and “ fresher” looking than the current application. Users also averaged a 97% task completion rate and rated the application as very usable with a System Usability Score (SUS) of 87.

What’s next?

Learning that we didn’t meet one of the usability goals lets us go back and address the issue before the product launches. There are minor adjustments we can make to the Sunrise task module to make it even better. Allscripts will refine the design based on these findings and continue testing with Sunrise users.

The best way to keep users at the center of EHR design is to involve them early and often in the process. Involving them in a meaningful way will continue to improve usability.

Whitepaper: Improving EHR Usability with User-Centered Design

How well-designed solutions improve patient safety, clinician efficiency and satisfaction.
design shortcuts that can stunt EHR usability

End users must be involved early and often throughout the design process. Some EHR vendors take shortcuts, which leads to poor design that negatively affects usability. These vendors call it user-centered design (UCD), but they make these common mistakes:

1) Counting demos as feedback sessions
Let’s say an EHR vendor is presenting a new product concept in front of an audience to collect design input and asks at the end of the session, “Any feedback?” This request for input doesn’t go deep enough to provide meaningful input to the solution.
Fix: Preview the solution in one-on-one sessions with actual users performing relevant tasks.

2) Asking too late
When an EHR vendor only collects user input for a new feature or solution just prior to launch, it’s too late for the clinician to give feedback that can affect product design. The product is about to release, and it would be too costly to change it.
Fix: Involve clinicians earlier in the process with formative testing using sketches, wireframes and prototypes.

3) Giving unrelated tasks
Using testing tasks that do not directly relate to patient safety and the specific end-to-end goals of the user do not adequately evaluate the product. Test results aren’t as valuable.
Fix: Rigorously assess tasks before testing them with users. Involve clinicians in designing the tasks to make sure they are clinically relevant.

4) Listening to (only) the squeaky wheel
EHRs should not be designed by the loudest user. Don’t over-generalize one person’s experience or feedback when designing solutions.
Fix: Consider each user’s feedback as a single data point in context with other testing results. Use data to explain to clients why product direction highlights efficiency, reduction of cognitive load and patient safety, particularly when you make a design decision that is not what they suggested.

5) Testing with the right users
All of these other items assume that the feedback is coming from people who are the actual end users of the solution. Too often, designers only collect feedback from the purchaser, who may not have the same background and goals as your intended users.
Fix: Collect usability data from the people that will be using the product for its intended purpose. It’s okay to collect feedback from others (e.g., purchasing, trainers, IT), too, but let user input guide and have the most influence.

Rigorous UCD processes improve EHR usability. Aligning with best practices is the right thing to do for many reasons, the most important for EHRs is patient safety. It also serves as the most effective and efficient way for clinicians to have an impact on the design of a product.

As Health IT catches up with other industries on the application of UCD, clinicians will be appropriately involved and users of Health IT will feel like the products were designed by someone like them.

Podcast: How Important is Usability?: Creating Platforms that Really Work for Clinicians
Ross Teague and Gareth Thomas (CIO, Salford Royal) discuss key user design principles in healthcare IT, and how these build truly smarter electronic health records that help, not tax, clinicians.
End users must be involved early and often throughout the design process.