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Clinical Quality Hearing

Health IT Policy Committee and Health IT Standards Committee

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Distinguished Members of the Committee, my name is Art Swanson, and I am the Director of User Experience at Allscripts Healthcare Solutions. Allscripts is the largest provider of Electronic Health Record and revenue cycle management software, and 180,000 physicians, 1,500 hospitals and many thousands of other healthcare providers in clinics, post-acute care facilities, and homecare agencies utilize Allscripts solutions to automate their daily activities and connect their clinical and business operations. As an experience in the software user experience process, I look forward to sharing with you today my perspectives on usability improvement opportunities associated with Electronic Health Record adoption, along with possible solutions for the related challenges.

The delivery of healthcare in this country is evolving rapidly and in a phase where providers and software developers alike must be incorporating new processes and information into our systems and workflows –we must remain flexible in order to encourage innovation while also being mindful of the responsibilities that come with the increasing reliance on the technology. One area in which this is noticeably true is in the general area of user experience or usability. In recent years, we've collectively experienced many improvements in usability, but there is also a struggle inherent to our efforts to continue to make those improvements in the midst of the ever expanding prescriptive approach to our product development stemming from the Meaningful Use program. Accordingly, I'm pleased to share my perspectives on how the health information technology user experience can continue to evolve positively in the coming years.

The Policy Committee asked, to start, what I see as the major usability issues to be resolved. The obvious answer is that the primary usability dimension in Health IT is currently related to patient safety. However, as the ONC has indicated in their Patient Safety Surveillance Plan, there are many elements to patient safety other than usability, and the process needs to include collaboration from all of the relevant stakeholders.

Other than patient safety, from the vendor perspective, the largest issues in usability revolve around two key concerns: Configuration/Personalization and workflow. One of the core components of any thorough usability evaluation is the concept of measuring a representative sample that would produce "generalizable results." This means that the testing needs to be representative of how the product would *actually* function in a realistic environment and represent enough scenarios to cover the range of usage.

Because EHRs are functioning as a form of enterprise productivity software, ensuring that our customers can effectively modify and configure the software to meet their changing needs is important to stay competitive in the market. However, this flexibility is often at odds with standard approaches to usability and usability evaluation for obvious reasons. Additionally, to design and evaluate the usability of a product or service, one needs to understand the users, the workflow, and the context of use. Because these elements are so dynamic in the healthcare domain, it poses significant challenges to design for optimal usability. For example, to test the usability of a prescribing system as would actually be experienced by our customers, we would need to evaluate the usability using all the permutations of configuration that any client would use. Do they have an in-house pharmacy? Are they a resident or an attending physician? Are they a pediatric practice prescribing medications to children? What class of medication are they trying to prescribe? What other medications is the patient taking? What sensitivity level is the DUR screen set to and who controls that setting? Is the prescription sent electronically or printed? And it goes on…

I was also asked what the timelines are for usability improvements, such as development and release of products based on user-centered design and re-engineering. We are already leveraging the User Centered Design process in our development organization and have a robust model that includes user research, iterative design, and long-term usage tracking as core components. All of our core products are leveraging UCD processes in their current releases and have been measured to prove usability improvements over previous releases. However, these processes are evolutionary and will not address all of the usability issues immediately – this is a process that will never be done, in fact. As indicated previously, the complexity of addressing usability issues in a highly customized environment with numerous user profiles, workflows and configuration options is significant.

In addressing some of these challenges, Allscripts' UCD process includes a step called MPG – Measurable Performance Goals – that need to be documented before design begins. These performance goals include usability goals like task completion rate, time to complete a task, and/or user satisfaction scores. We then use many tools during the design process to evaluate our performance against those goals, including formative testing, performance modeling tools (like CogTool), and formal, Human Factors-oriented Risk Assessments.

We also, of course, since it is core to User Centered Design, collect input from our clients at every step of the design process. This includes:

1. generative and ethnographic research to understand client issues more comprehensively, outside of the domain of any one product.
2. define and refine customer requirements with a "goals and needs" hierarchy that is validated with on-site ethnographic research as well as targeted client interviews.
3. convene a group of clients that participate in the iterative design process, offering feedback and direction to define the initial design direction
4. perform usability testing to validate functionality prior to code complete.
5. track usage metrics to understand how the products are being used in the real world when we conceive of new products or subsequent versions of the current products.

In evaluating the usability and safety of our products, we go thorough research, define measurable performance goals, measure our success against those goals early in the design process with tools and user testing, and refine the design based on that feedback. By the time we get to the final summative usability test, it should just be confirmation of the previous results.

However, there will be always some safety issues that are not accounted for in the UCD process. Issues that are identified as potential patient safety issues – either as reported by clients or raised by Allscripts staff – go through a rigorous process in which we identify the root cause of the issue, map its resolution, notify clients if necessary, and measure the solution to ensure that the issue has been

effectively resolved. We have several dedicated clinical usability staff that are focused on monitoring and managing patient safety issues, including those tied to usability.

This process continues after the products are deployed, too, as we routinely capture usability feedback from our customers once they are using the systems in their real world environments. We have four key channels for this customer feedback:

1. We have a robust early-adopter and testing process in which we are on-site as customers are testing new solutions and/or features. The feedback from this process influences the final product released to the market.
2. When the product is available, we collect usability feedback from clients directly on our client community site. We have an active community joined by tens of thousands of our clients, and one of the topics on which we gather feedback is usability – both challenges and potential solutions. The clients also support each other on workflow and configuration optimization.
3. We also gather quite a bit of feedback from our sales and client executive staff. They are frequently on-site with clients and will solicit feedback and deliver that back to the development organization to help improve the products.
4. Finally, we are starting to instrument all of our applications so that we can monitor usage statistics, which will allow us to understand and even predict usability issues before they happen.

The challenge of developing products for mobile platforms from a usability perspective is an interesting one. The opportunities for mobile development are unbounded in the healthcare space largely because it is one of the few business domains that is truly mobile, and delivering effective mobile solutions is critical to the strategy of all Health IT vendors.

Allscripts has been a leader in mobile application development from the early days of smart phones. We have had several iPhone and iPad apps, as well as Android apps, to date, and we were one of the pioneers in the industry in allowing edit and entry capability on smart phone platforms. From the beginning, we have leveraged a robust UCD process, including ethnographic research, to drive our mobile application development. However, the usability challenges posed by mobile application development *are* many and include:

1. functional issues (difficult data entry, small screen size, limited application size, difficult to integrate peripheral devices)
2. procedural issues (bring-your-own-device, security, updates, maintenance)
3. environmental issues (glare, smudges, lighting, sanitation, ergonomics)

Meaningful Use and other regulatory requirements, as noted above, are also creating real usability challenges for Allscripts and other vendors to grapple with. These requirements are moving the industry in some very positive ways when it comes to interoperability, quality standards, wide-spread EHR deployment, etc. However, these initiatives and their associated software requirements have simultaneously diverted significant development resources away from other product enhancement and innovation efforts. It is also clear that there are things we have had to incorporate into our products that were entirely driven by the regulations – not by market value or demand by our clients, but simply to achieve certification. The pace of the required changes, in conjunction with the narrow timeframes between availability of all the information needed for software developers following final rule publication and attestation, creates a large burden on the vendor community that adds to our usability challenges more than helping to address them. This is something noted by provider organizations on many occasions.

The usability process does not end during development at Allscripts but continues during implementation. We provide training and guidance on best practices during the implementation process to ensure to the best of our ability that our customers are successful with our products. Additionally, Allscripts offers optimization services where clinical consultants will work with clients to optimize their process, workflows, and product configuration to ensure successful outcomes. As an example, we suggest “certified clinical workflows” in our Enterprise EHR product that clearly define the optimal clinical workflows for common tasks in the product. These have been learned through the hundreds of implementations and trainings we have done with organizations across the country, and we do our best to spread this knowledge – both as it relates to general usability and patient safety applications – to our new clients, as well.

The last thing I will mention is that I spent some time thinking about the ways that ONC and CMS could help us improve the usability of our products. Ultimately, it boils down to something fairly simple – ensuring that the regulatory environment supports the vendor's ability to innovate and drive these products forward. This may sound like a simple answer, but it's the truth. With the healthcare system and Health IT evolving as rapidly as it is, our concern is that layers of prescriptive regulatory compliance are in fact hampering our ability to adapt to the changing landscape. Defining the compliance structure in terms of shared goals and outcomes rather than the prescriptive guidelines that have been rolled out to date could allow the innovative market leaders to maintain their agility, while also being nimble enough to encourage new companies to enter the space and innovate, as well. It's been said before, but it's worth restating – the software development industry wants the goals and the measures but not to be told how to do it. We can determine the How if you tell us the What.

Thank you for the opportunity to share my thoughts today. I look forward to answering any questions you may have.