

**Implementation/Usability Hearing
HIT Policy Committee and HIT Standards Committee**

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From: David (Scout) Addis, Director of User Experience, Practice Fusion, Inc.

To: Members of the Health IT Policy Committee and HIT Standards Committee

Date: July 23, 2013

Re: Usability Panel

This testimony to the HITPC & HITSC Implementation/Usability Public Hearing addresses both the usability challenges faced by electronic health record (EHR) vendors, and the current design and development processes that are in place at Practice Fusion. Practice Fusion's mission is to improve patient outcomes by providing free, web-based electronic health records to physicians and their practices. We believe in the urgent need for health care technologies that reduce costs, improve the quality of care, and save lives.

What do you see as the major usability issues to be resolved?

A major usability issue that needs to be addressed across the EHR industry for ambulatory care is educating health care providers on the benefits of software systems and electronic health records as a means to help them deliver higher quality care to their patients. Some physicians ask, "Do electronic health records actually help me to deliver better care?" and many still don't believe this to be true. In the past, EHR systems were primarily focused around data and regulatory needs that mirrored the paper models previously employed in practices. That made those systems unintuitive, difficult to use, and required that providers follow rigid workflows that were contrary to the ones they were accustomed to using. Today, EHR vendors are addressing these issues through improvements in design and usability.

Based on feedback and commentary from health care providers, their trade organizations, and from Practice Fusion users, practices desire systems that are as quick and easy to use as paper, combined with the advantages of structured data to help make better decisions and improve outcomes. Providers need dynamic tools that are predictive enough to adjust to their specific circumstances based on their specialty, preferences, current workflow, and patient history. They want software that behaves like a well-trained assistant that learns their workflows and is then able to accurately predict what actions they might take next.

Aside from the overall desirability of an EHR that enables quicker documentation and provides value with insightful, actionable feedback, there are other specific details of current systems that should be addressed. There is an ongoing effort to improve patient safety through the reduction of safety-related usability errors. This type of mitigation can be facilitated through many usability enhancements, including the use of unambiguous and clearly presented alerts, techniques to minimize notification fatigue, providing contextual information to assist in decision making, and safeguarding against charting on the wrong patient. These fundamental safety issues should be core to the conversation regarding improving overall usability.

What are your timelines for usability improvements, such as development and release of products based on user-centered design and re-engineering?

The Practice Fusion product development process is based on a *Design First* strategy. Instead of traditional requirements-based development, we leverage a user centered design process, rapidly iterating to an ideal state which is then used to anchor requirements and development discussions. We start from a vision of the ideal user experience and evolve the design as we factor in any constraints. We spend more time in the design phase because it is more efficient to validate and then make these changes in pixels than it is to rework them in code.

Practice Fusion also utilizes an agile development process, which results in new improvements to our products being released to our customers every two weeks. Unlike many other EHRs that may require lengthy and complicated implementations and configuration processes with only periodic updates, we can respond extremely rapidly when we identify opportunities to improve the user experience.

User-centered design is core to the Practice Fusion business. We use a goal-directed methodology for bringing new products and features to market that is broken down into specialized phases:

- Research – We utilize ethnographic and quantitative research methods to understand our users, their behaviors, and the needs of their practices.
- Model – Using the results of our research, coupled with proven design patterns and principles, we develop personas and ideal experience scenarios as the cornerstones of our designs.
- Frame – By building a flexible, robust design framework we can support the existing needs of our customers and accommodate new situations and technological updates in a seamless manner.
- Refine – Practice Fusion’s design team works closely with our developers and program managers as they scope and prepare for development. As part of this process, we provide the development team with detailed visual designs including all states for each component.
- Test – Testing occurs throughout the design and development process, as well as after a piece of functionality is released. The testing process also involves actively seeking feedback and guidance from users and subject matter experts to help improve what is built. Practice Fusion instruments all of our interactions so we can monitor and evaluate the performance of our product.
- Feedback – We are always listening and responding to our users. One mechanism for gathering feedback is through our user forums. As topics are posted, which may represent future product designs or features, in addition to current features, users can up-vote the things that they agree with or vote down things they think are idiosyncratic or not useful. We evaluate this feedback on a regular basis and it is a core contributor to our feature prioritization strategy.

Our design team strives to always be 2-3 sprints (approximately 4-6 weeks) ahead of our development teams in order to have sufficient time to thoroughly review and validate designs both internally and with our users.

Describe your efforts to develop products for mobile platforms, and usability challenges and opportunities created by mobile platforms.

The Practice Fusion HTML framework allows us to design and build responsive versions of all Practice Fusion products so that they are both touch and keyboard friendly.

There are many usability challenges (and opportunities) that have resulted from migrating EHRs from the desktop to smaller mobile platforms. EHRs are by nature complex, usually sovereign systems that are not ideally suited to smaller screens. Small screen sizes make it difficult to make decisions within context and to see all of the relevant data that is needed to inform those decisions. While it is certainly possible to cram an entire EHR into an iPhone, that will likely result in poor user experience and could adversely affect patient safety.

The EHR experience for mobile devices such as tablets and phones should be optimized to accommodate those activities that can be accomplished well in a small form factor. Practice Fusion is currently working to refine designs for these activities so that users on the go have access to the areas of their EHR that will benefit them most in non-traditional care delivery settings. Some examples of highly desirable mobile features include access to schedules, messaging and task management, prescription renewals, and emergency access to patient records. By allowing providers access to core EHR functionality optimized for mobility, they can handle many aspects of delivering care conveniently, and efficiently outside of the office.

What requirements of Meaningful Use, or other regulatory requirements, create usability challenges?

The previous pace and overall volume of new and emerging Meaningful Use regulations, in addition to their often prescriptive nature, makes it difficult for EHR vendors to dedicate the time and resources needed to address many of the clinical workflow and usability needs of their customers. While the specific ONC certification components that address user-centered design are limited to the Safety-Enhanced Design requirements, usability is impacted by every regulatory requirement that specifies certain functionality and/or requires that the EHR support specific code sets, workflows, actions, and options.

The design team at Practice Fusion has had to take the time to become well versed in the myriad details of Meaningful Use requirements. These requirements are complex and far reaching, and as a result, the designers are limited in the time they have to design, test, and plan for the other features and functionality that come directly from our customers and stakeholders. In addition, EHR vendors are subject to not only the product, development, and data requirements that fall under Meaningful Use, but we must also ensure that our organizations and products are in line with many other regulations and requirements that impact product development in the healthcare industry, including the Health Insurance Portability and Accountability Act (HIPAA), quality reporting programs, and ICD-10 implementation.

Understanding and solving usability issues involves shared responsibility amongst health care providers, trade organizations, and EHR vendors. We must acclimate users to the changes that come along with new regulations and build technology that is efficient, usable, and meets these criteria. However, when it comes to Meaningful Use, government agencies such as ONC and

CMS also must take on some of that shared responsibility. They must help providers understand the benefits of the prescriptive Meaningful Use requirements and communicate to providers why EHR vendors may not be able to change certain features because they are regulated under the ONC certification program.

In what ways can ONC and CMS help you improve the usability of your products?

As mentioned above, ONC and CMS can help to improve the usability of EHR products by allowing vendors the flexibility to focus on design, innovation, and the specific requirements of our customers, while also delivering products that meet regulatory objectives for Meaningful Use. This can be accomplished through a variety of means, including slowing down the pace of setting new Meaningful Use requirements for both EHR vendors and health care providers. In addition, ONC and CMS can increase their efforts to educate providers on the benefits of Meaningful Use while also educating providers on the value of specific workflow requirements and EHR features.

The nature of the Safety-Enhanced Design (SED) certification requirements under the 2014 ONC certification program is one that should continue in a similar fashion for future stages of the program, regardless of timing. Specifically, the Stage 2 SED requirements are not overly prescriptive, but rather follow a “goals-based” approach by identifying a baseline for applying user-centered design processes but not specifying what standard EHR vendors must apply or how they must apply it.

In conjunction with focusing on the “what” and not the “how”, it would be beneficial to vendors if ONC acknowledged a wider range of development styles and processes. We encourage that they permit greater flexibility in implementing user-centered design, so long as patient safety and basic quality standards are not compromised. Practice Fusion fully supports the ONC in its initiative to send liaisons to EHR vendor sites. In particular, we believe that the site visit allowed for a more in-depth knowledge sharing about its interest in specific user-centered design best practices. We suggest that ONC continues to engage in these types of discussions with vendors.

EHR vendors with in-house designers are less in need of ONC guidance because they are already actively engaged in solving the most challenging safety related usability problems because their users have requested them. Vendors without designers and usability experts on staff have the greatest need for guidance in order to enhance the quality and safety of their products. For those organizations, ONC and CMS could assist in improving product usability by identifying good design patterns and principles of usability without prescribing requirements. Because there is a wide spectrum of usability implementation expertise and application across the EHR industry, it could be potentially disruptive to vendors who are already in the more advanced stages of applying their designs if they were required to change or alter their processes to account for the needs of lesser-developed organization. The goal should be to elevate the work of vendors who most need usability guidance, not force design-centric vendors into less innovative solutions. As a vendor who identifies design and usability as one of our highest priorities, Practice Fusion fully supports cross-industry collaboration and education on usability, as well as the research being done by non-vendor organizations with regard to EHR design and clinical workflow usability.

What type of guidance is provided during implementation?

Practice Fusion is a web-based EHR platform. Our users can register online and gain immediate access to our system. Users can begin charting the same day that they sign up.

For direct guidance and education of users we provide a host of tools to learn how to utilize our EHR and become proficient in its operation. For example, our standard configuration is augmented by a set of specialty based workflow templates, which help practices create workflows that are tailored to their needs. Providers can also create custom templates for their practice, which allows for even greater customization. In addition, our trademarked “Phenomenal Support” is based at our headquarters in San Francisco, California, and provides support via all communication channels; including phone, live chat, email, and help forums.

Once a user has registered for the product, the Practice Fusion in-product Configurator provides a structured guide for new users that helps their practice get up and running quickly with the most common functionality that they will need to begin using the EHR successfully. We also provide a comprehensive video training library with easy to understand step-by-step instructions on how to utilize the features in the Practice Fusion EHR. These videos are supplemented by weekly webinars where users can have their product questions answered directly by our training staff. If needed, on-site training can be arranged anywhere in the United States through a network of Practice Fusion verified trainers. For providers willing to travel to our offices, PF Academy is our, in-person training session where users can spend time learning about our EHR directly from our most experienced support specialists.

How do you incorporate usability objectives and criteria in the design process?

Usability and user-centered design principles are fundamental to every product decision that we make at Practice Fusion. As such, design is an integral part of the development process within our organization, from planning through launch. When we are presented with specific usability objectives and criteria from sources such as regulations, we immediately determine how these new requirements impact our existing frameworks and can be accommodated into the rest of our designs. As the design teams work through this new functionality, we constantly engage with our personas, solicit direct user feedback, and consult with our own domain experts to determine the best solutions.

The success of features and functionality in any software system can be measured in a variety of ways, so Practice Fusion identifies the most appropriate criteria for the project in each particular situation. These criteria can include things such as:

- Peer review of designs: Are other designers in alignment with the design choices and do they match our existing frameworks?
- User feedback in our forums: Are users happy or critical of the new features?
- Usage metrics: Do the metrics meet our intended goals?
- A/B or multivariate testing: Which option has performed best?

- Marketplace: Do other vendors or companies with similar problems utilize similar solutions?

How do you prospectively (during the design process) incorporate input from your customer users?

The design and development process at Practice Fusion is always evolving and does not end after a feature has been released. We are constantly and actively soliciting and responding to feedback from our user community through all phases of product design, development, and implementation. However, during the initial design and development process, user input is gathered in different ways and is evaluated against a potentially different set of criteria than user input that is gathered after a feature is launched. For example, safety-related issues are evaluated extremely rigorously in the development process prior to release in the product. Practice Fusion requests specific user feedback on the safety and clinical efficiency and usefulness of those features and incorporates that feedback prior to engaging with the full user community regarding that feature. There are several specific types of input that Practice Fusion seeks out from our user community to inform our initial design and development processes:

- We conduct ethnographic research to model personas and identify core scenarios through the system.
- We provide digital prototypes and walkthroughs of new features in forum posts for review and commentary by users.
- We conduct interviews with providers and their staff to enhance the knowledge of our design and development teams.
- We engage with subject matter experts to provide specialized feedback for complex interactions and regulatory issues.
- We evaluate other health technology products to identify potential standards and where those standards can be improved upon.

How do you evaluate the usability and safety of your products?

Patient safety and data security are the two highest usability priorities at Practice Fusion. Every piece of functionality is examined through these lenses during the design and development process. We rigorously assess the various scenarios that could potentially compromise either, and develop solutions that prevent adverse effects or any regulatory violations. We constantly review new research and literature on safety-related issues that affect health IT, and have adopted additional usability reviews for features that are seen as having the most significant safety-related ramifications, such as e-prescribing, allergies, computerized provider ordering, and medication reconciliation.

General usability and safety are treated somewhat differently when we are designing new functionality. Typically, we haven't invented our own safety mechanisms, but rather we base ours on existing regulatory standards and best practices identified through independent research studies. By using existing standards and norms, we leverage the existing mental models of users instead of introducing something new that is unique to our system. As an example, the

transportation industry could design a better stoplight, but that would require replacing every stoplight, or everyone would need to recognize two models of stoplights, which introduces a greater cognitive load on drivers.

We always strive to conform to accepted practices, but this does not mean that our designers are complacent. Practice Fusion is always looking for ways to build more safety conscious workflows and improve the standards for safety signaling without disrupting them. Every user of our system needs to immediately and intuitively understand when something is critical and then how to respond.

How do you capture usability feedback from your customers on your products once they are in the field?

As mentioned above, Practice Fusion actively solicits and responds to feedback from our user community throughout all phases of product design, development, and implementation. We utilize many of the same feedback processes both during our initial design and after features have been released to our full customer base, although there are specific mechanisms that provide more specific information after a feature is live. Since the Practice Fusion EHR is web-based the most current version of the application is deployed to all customers simultaneously, and product updates, including new features, are available to all users as soon as they log in to their accounts. This cloud-based model allows for a more fluid development process that is supplemented by ongoing user interaction and usability evaluations.

Practice Fusion utilizes the majority of the usability methods referenced in the ISO 9241- 210 standard for gathering feedback from our user community and evaluating the usability of our product. Below is an outline of some of these methods and how they are implemented.

- **Observation of users for discrete functionality and new features.** When Practice Fusion makes a substantial upgrade to existing functionality or are rolling out a large new component, we make sure that we preview it to users when it is still in the design phase, prior to any code being written. Users are able to explore particular use cases using these wireframes and prototypes. This provide us with invaluable feedback that helps to further refine the design and clarifies whether it meets the goals and needs of users.
- **Performance related measurements and Critical Incident Analysis.** Data driven design is an ever-expanding discipline for helping to improve usability. Software like Kissmetrics, Optimizely, and our own internal tools help us to identify trends and patterns so that we can identify where users are experiencing issues. Metrics allow us to perform tests on our design hypotheses quickly and efficiently.
- **Questionnaires.** Practice Fusion utilizes surveys, forum posts, telephone calls with providers, and in-person usability testing sessions. Feature requests and usability issues that come in via our support channels are triaged and brought to the attention of the design team in weekly meetings. We monitor this feedback to spot trends and identify areas for product improvement.
- **Interviews.** We conduct ethnographic research of users, domain experts, and stakeholders to clearly understand the designs for new features and functionality as well as to identify areas in the platform that could use improvement. We have selected a

experienced group of Practice Fusion providers and office support staff who we can quickly contact to assist with design and usability questions as needed.

- **Collaborative design and evaluation.** Our user centered/goal directed design process is critical to the development of our EHR. It is constantly used in a collaborative environment amongst internal Practice Fusion teams in addition to making use of our large and diverse user community.
- **Creativity Methods.** Practice Fusion employs many techniques to get to usability solutions quickly and efficiently. These include group brainstorming, collaborative whiteboard sessions, and paired design problem solving techniques. This is combined with a continual stream of news, articles, research, and reviews of the most current thinking on design and healthcare IT.
- **Expert Evaluation.** The design team is composed of experts in interaction design, visual design, human factors, usability, research, design communication, information architecture, and rapid prototyping. We work in cross-functional teams to evaluate and improve each other's designs.