The Shoes of the End User Are a Developer's Most Important Tool

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Two-thirds of health IT executives in the U.S. believe the use of mobile technology will substantially or dramatically impact the delivery of healthcare in the future. But how will the form and function of this technology be defined? How can the designers of technology ensure the best fit with the needs of the healthcare professionals who will make use of it? The answer is to take a long walk, perhaps several long walks, in the shoes of these intended end users.

What Have We Learned Already?

Let's take a closer look at that survey, from the Healthcare Information and Management Systems Society (HIMSS) [1]. It found that, between 2011 and 2012:

- The use of mobile devices to capture visual representations of patient data increased to 27 percent from 13 percent.
- The number of healthcare providers allowing patients to access medical information on a mobile device rose to 36 percent from 32 percent.
- One quarter of respondents in 2012 said all data captured by mobile devices is integrated directly into their organization's electronic health records.
- Three-quarters of the organizations surveyed in 2012 said they will use more mobile devices in the future, especially tablet computers.

Now consider these findings, from Spyglass Consulting's 2012 Point of Care Computing for Nursing report [2]. At 69 percent of the hospitals included in the survey, nursing staff were using their personal smartphones while on the job for personal and clinical communications due to "critical communication gaps with existing technologies provided by hospital IT." This has raised obvious concerns with hospital IT departments about security and support.

The report found that respondents at 96 percent of the hospitals included in the survey believed first-generation tablets were not the right device to support bedside nursing due to issues with durability, infection control, limited data entry, and lack of native applications.

Bringing mobile technology to the bedside requires a far more substantial investment than just creating purpose-built apps for consumer-grade devices. It requires a wholesale investigation of the workflows, disruptions and crises that nurses, clinicians and doctors must manage every day as part of their routines to provide top-notch patient care. Only with this kind of intelligence can developers and designers create truly useful devices and applications that will be embraced by the intended users.

Know What's Important to the End User

An excellent example is eMAR (electronic medication administration record), a medication-administration system that has helped many hospitals and clinics decrease medication error rates, increase patient safety, and improve workflow.

eMAR should not be considered a successful example of a mobile technology implementation in the healthcare setting because it allowed nurses to do their jobs faster. If that's the measuring stick for success, the point has been completely missed, and what a nurse would say is her or his most important consideration has been ignored.

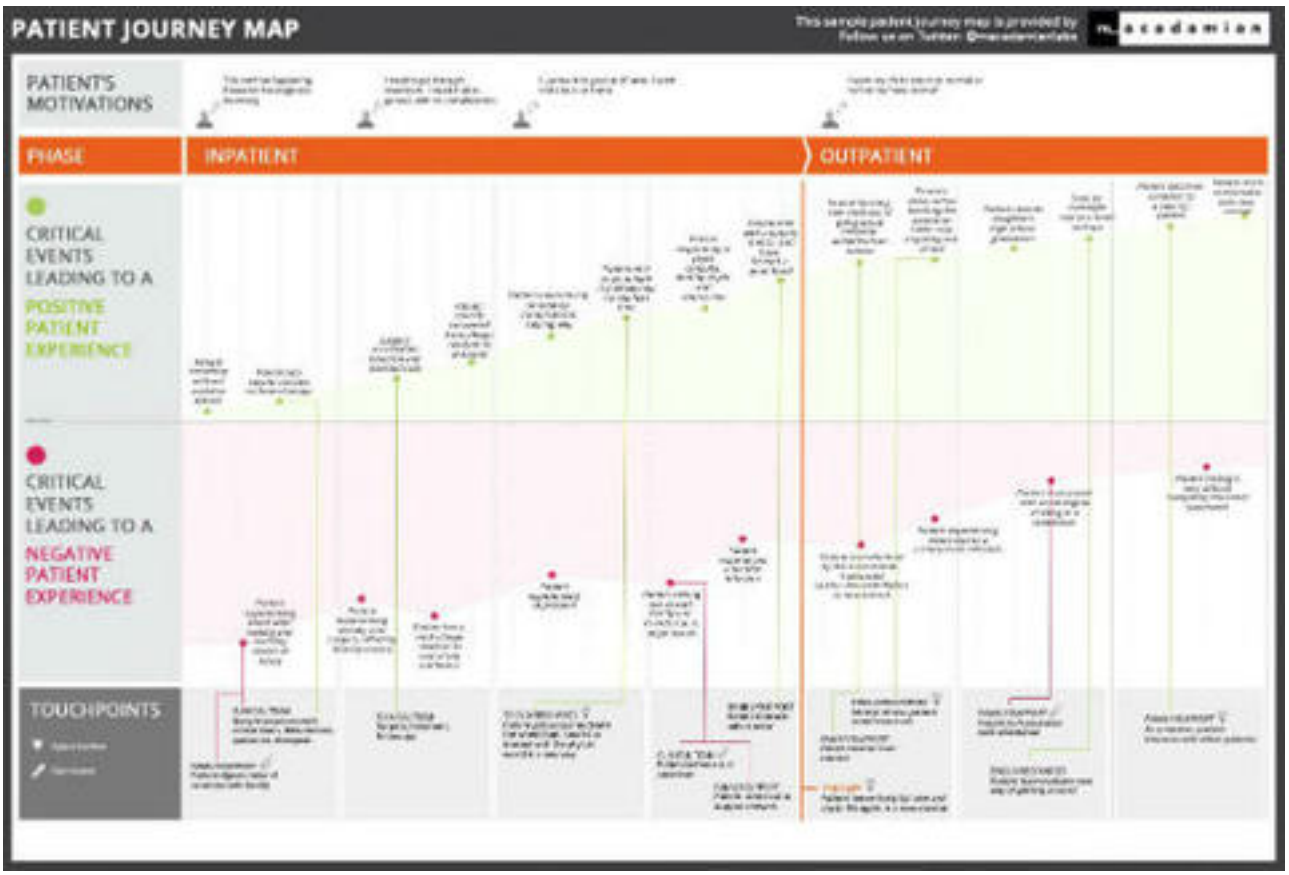
Look at a nurse's day in the hospital ward. Nurses have dozens of patients under their care, each with unique and specialized needs. Interruptions and distractions challenge their focus constantly. This left traditional medication administration, even if it was digitally managed, prone to error, because it relied on human data entry and peer-to-peer verification.

With eMAR, each patient is identified with a wristband barcode. The nurse scans it and this brings up the medication record. Each individual medication is scanned and the system reconciles the two readings. The risk of error has been substantially reduced.

Has this saved time? Not necessarily. In fact, it may have added time. But what's important from the perspective of the nurse, and for the hospital in terms of its liability and regulatory compliance, is that risk has been minimized. This is what's important.

And Know What Isn't

Now, consider again the circumstances under which nurses may be using a given technology: Is it at night time, when lighting is poor? Is it when they may not have full use of both hands? Are you frustrating them with having to take too many steps to complete a task? In a code-blue emergency, for example, a nurse wants to alert the whole response team with the push of a button, not a flurry of text messages and pages.



[3]As technology becomes more powerful and compact, it's easy for the designer or developer to be caught up by the wow factor of what can be done, and lose sight of what is truly practical and useful. Bells and whistles intended to make the end user's life easier with added features and functionality can end up creating noise and confusion that is counterproductive.

Lacing Up and Taking That Walk

There are two ways to carry out thorough design research to gain an understanding of how the user works in real-world conditions (including pain points, workflows, processes and interactions between other people and products).

The first is the journey, or experience, map, which provides a holistic and graphical overview of the various touch points users have with the technology in the course of their day (Figure 1). The great thing about the journey map is that it is a highly actionable document that pin points where there could be a problem that degrades the user experience or imperils reliability and security. We can also be quite specific in identifying the factors at each touch point that will lead to a positive experience or a negative one.

[4]The second is the storyboard, which focuses on the workflow of the day, rather than the interaction with the technology (Figure 2). We can easily visualize the points in a day, or in a patient engagement, where a nurse or doctor may be distracted. This makes it easy for the design team to see where technology could help healthcare professionals become more interruption-tolerant, and appreciate how distractions impact a person's ability to absorb information from different screens.

There Is Still Much Work to Do

In most cases, less is more. End users will only embrace a piece of technology if they are not frustrated by a learning curve and have trust in its reliability. In fact, as eMAR demonstrates, reliability and risk mitigation, rather than speed and efficiency, are often the most important considerations for technology intended for healthcare professionals. Speed and efficiency is still important but on a secondary level.

Despite the fact that we have highly effective tools such as journey maps and storyboards at our disposal, our industry still needs to improve. Ensuring that the

end-user perspective is a driver of the design and development process is still not as mainstream as usability testing, which focuses on efficiency and efficacy.

But a design process governed by these end-user considerations has the best chance of producing a piece of technology that will be embraced by its target audience and used to its full potential.

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