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CMSI 4071

Assignment 1

1)

We chose to read the article, “Why Doctors Hate Their Computers”, by Atul Gawande of the New Yorker. It’s a sweeping exploration into the effects of medical software systems on clinical care. The writer, Atul Gawande, is a surgeon himself, and provides personal anecdotes as well as those from fellow medical colleagues. These anecdotes, along with several surveys and studies he provides, paints a clear picture about the current state of software systems in the medical field: the introduction of new medical software is creating a new area of stress for physicians when it should be streamlining their tools of care.

Aside from the big learning curve that a workflow revamp like this would have, there are time management issues arising for physicians. Gawande cites a 2016 study that found that physicians spent about two more hours doing computer work for every hour spent face to face with a patient. This has led to increased work hours for doctors who are adjusting and learning these tools, but it’s not simplifying their day to day tasks. Rather, it seems to obstruct their natural work patterns and add even more to their plate.

Another issue doctors have with the digitization of hospital systems are design choices within the software itself. Administrative staff and doctors have differing views about what should be included in various medical forms. As a result, simple forms become complicated and patient histories grow in size with less relevant information. This creates more time spent on computer work for doctors during actual appointments, which adds up for doctors that see over 20 patients a day.

These issues are contributing to a bigger problem for medical care: higher levels of burnout. The connecting link was found in a study by the Mayo Clinic, which observed that one of the strongest predictors of burnout was how much time an individual spent tied up doing computer documentation, which new medical systems are adding to. This produces a cascading effect across different fields of care. Doctors suffer, which means that patients suffer as well. Several patient anecdotes reveal how patients notice the amount of time doctors spend on the computer during their appointments, leading to feelings of disconnect and not feeling heard.

An interesting perspective that Gawande provides is that of Gregg Meyer, a chief clinical officer that supervised software upgrades at some hospitals. In the divide between doctors and administrators, he seems to represent the reasoning of the latter. Meyer understands the qualms that physicians have with the software, but is committed to a long-term transition that he is confident will improve over time. Furthermore, he cites the benefits it brings patients, believing that it helps them find their lab results easier, get prescription refills faster, and view important information about their appointments better.

Another portion of the article is spent discussing the system of medical scribes to combat the inefficiencies that new software systems are creating. The primary concern is that doctors have too much on their hands during appointments between examining their patients and entering information into the system, so they bring along a medical scribe that handles the computer-related tasks. A move that seems to move backwards, but serves doctors well as an easy fix. Another layer to this is the existence of virtual scribes, where medical professionals from across the globe in countries like India watch recorded patient visits and fill out documentation and submit it.

That isn't the only way doctors are adapting to these new systems. Some are directly trying to tinker with the systems themselves to create a better experience for the doctors that use it. A neurosurgeon from the University of Pennsylvania fended off complaints from administrators and

software providers to work with the IT department to reimagine features with the input of other doctors in his department. This approach, while being the one that feels most straightforward, carries some risk in creating more bugs and performance issues for these behemoth systems and is unlikely to become the norm as software providers would fight back against this more “open-source” approach that would potentially hurt their revenue.

Gawande suggests an API, where doctors and staff could pick apps according to their needs. This approach feels reasonable, because it recognizes that different departments have different needs for their software. Rather than coupling everything tightly together, separating different features and tools into their distinctive apps could improve performance and user-experience, maybe even reducing the steep learning curve that current systems have. In fact, this approach is key in modern front-end software engineering where key UI elements and features are separated into individual components to achieve separation of concerns.

2)

One valuable takeaway we had from reading Gawande’s article stems from the theme that current medical software is a pain point for doctors and patients alike. This article does cover some of the benefits this new software has brought, but if the doctor and patient experience still decreases as a whole, then the product did not successfully fulfill all its goals. There is a valuable lesson here that is applicable to software engineering - nailing down the little details produces a big effect. This is even more important in a field like medicine and healthcare, where precision and efficiency makes every difference when it comes to saving a life.

Furthermore, these issues bring into focus the clear disconnect between the software developers (Epic, for example) and the clients, in the case of the doctors. Creating a system that

pleases everyone, especially in a highly demanding and technical field, is no easy task for any developer. However, we were surprised to read about how many issues doctors in this article had with basic tools and forms in the software. There's no doubt that Epic consulted doctors for feedback on their systems at some point during development, but this story does raise concerns of whether they conducted enough testing to ensure the quality of key features.

A third takeaway we had is that this should actually further encourage revamping outdated medical systems. A common reaction to a story like this would be to encourage moving back to a paper-based system, since that is what doctors have comfortably been using for centuries. But if anything, this story highlights the need for a modernized digital system. Even with this system's warts and all, a study noted that thirty-day death rates following hospital computerization dropped 0.21 percent a year starting from the first year onwards. This is a significant bit of data, because if a system as convoluted and inefficient as the current one is leading to better macro-level health and care, then imagine what a dynamic, fully-fleshed out system could provide for the general public.