How to Avoid Common Pitfalls of Health IT Implementation

Christina Pagel, PhD, David W. Bates, MD, MSc, Donald Goldmann, MD

The stories in this guide were based on case studies about a specific intensive care IT system that integrates information from bedside monitors into a single intuitive display to provide better real-time information for clinicians.

Why Did We Develop This Guide?

The potential benefits of health information technology (HIT) for delivering better health care are so obvious[1-3] that the pressure to develop and implement HIT and clinical decision support (CDS) systems continues to build, even though the anticipated benefits are rarely fully realized, at least early on.[4-13] Implementing new information systems within hospitals is almost always harder than anticipated by decision makers, clinical teams, and software companies.[14-17]

Many of the barriers to success occur at the final stages of implementation,[15,17-19] in the nitty-gritty of *how* a system is implemented, *whose* work and goodwill are required to make it happen, and *how* a system is incorporated into existing workflows. Much research exists on the barriers to implementation and how these barriers can be overcome.[4,17,20-23] However, it is much less clear how this valuable information should reach busy frontline clinician leaders or senior hospital executives who often oversee the purchase and implementation of new HIT systems, particularly in the case of smaller, more bespoke systems for individual specialities or wards.

We hope that these cartoons and accompanying tips can help bridge that gap.

The Evidence This Guide Is Based On

The stories in this guide were based on case studies about a specific intensive care IT system that integrates information from bedside monitors into a single intuitive display to provide better real-time information for clinicians.

We conducted face-to-face interviews with 20 people (six ICU physicians, five nurses, three nurse practitioners, and six IT specialists) at four hospitals across the U.S. who had recently implemented this IT system, and another three IT specialists at the vendor company. Interviews took place between October 2016 and July 2017.

We explored the implementation process by asking about the following topics:

- *When* did people find out about the new system and *what* information were they given?

- *How* was the implementation process negotiated?

- *Who* did they work most closely with during implementation?

- Were there roles whose importance was *not* anticipated?

- Were there specific potentially *avoidable* delays or challenges?

- How have different teams *responded* to the system once live?

- What, if anything, would people have done *differently* with hindsight?

We then carefully analyzed transcriptions of each interview to identify common themes and developed storyboards that showcased the barriers. We contracted a cartoonist and worked closely with them to develop characters and cartoon strips to illustrate the storyboards. In parallel, we selected key quotes from the different roles to accompany each cartoon with real examples and summarized the learning in short "Top Tips" sections.

We shared the first cartoon drafts with all interviewees for feedback. Feedback was very positive, and we incorporated suggestions into these final versions.

Common Pitfalls of IT Implementation and How to Avoid Them

About to Buy a Cool New I.T. System for Your Hospital?
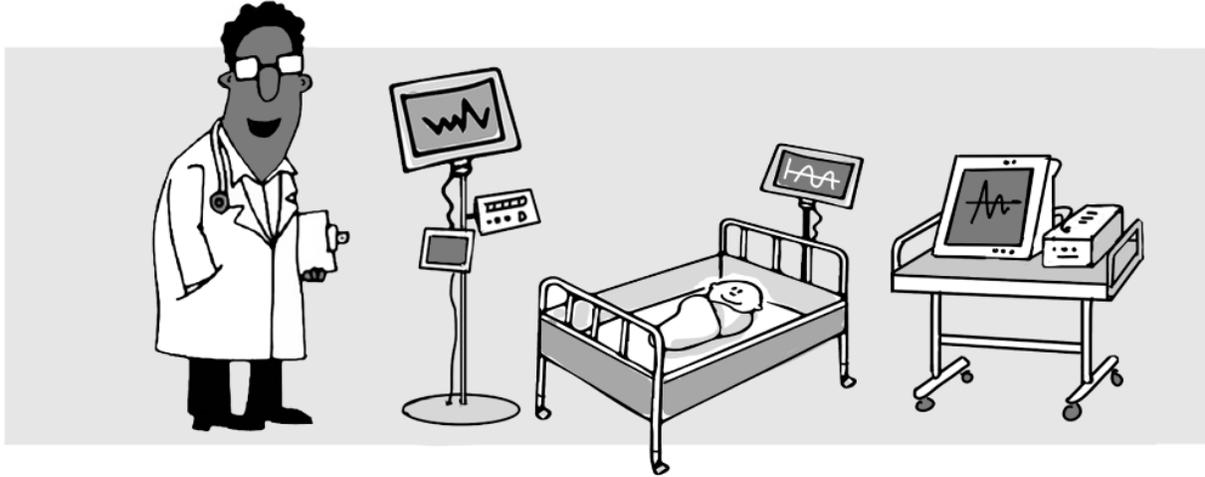
Source: The author

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STOP and read this first!

This short booklet brings together the IT experiences of doctors, nurses, and IT staff at different hospitals sharing the things they'd wished someone had told them.

These tips are mainly for **smaller, specialized IT systems** instead of big centrally run implementations such as electronic medical records.

There are four main themes: each theme has one page of common pitfalls and tips and one page of helpful quotes from interviewed hospital staff.

We hope that you find these tips useful.

Getting to ink on contracts — you probably haven't even met most of the people you need to yet!
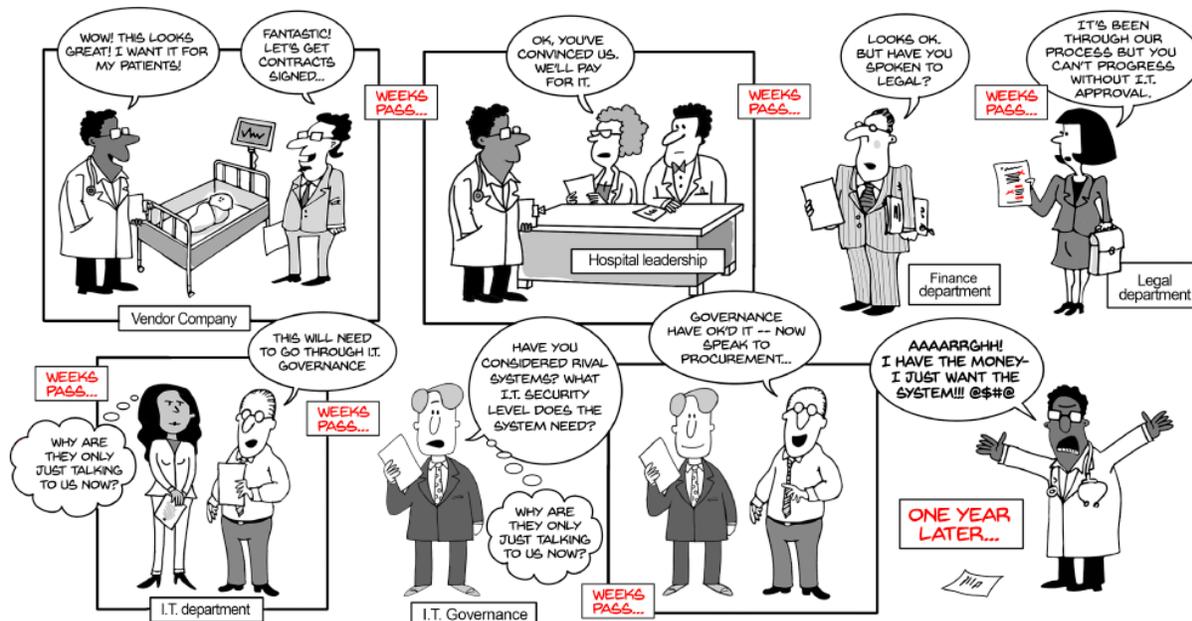
Source: The author
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Be proactive! Delays are the default:

· **Who you know**: Make a list of all the departments / leadership you think you need to involve. **This will not be everyone you need**.

· **Who they know**: Talk to those people**now** and ask them who**they** think should be involved. Then ask**those** people . . . keep going until there are no new names.

· **Talk**: Get people together to talk and understand processes. You will need to jump through hoops you never knew existed — held by people you have never met. Hospitals often require approvals from many different places.**Be patient!**

Because it involved I.T., even though the CMO had signed it off and we had his blessing and the promised resources and the contract, then we had to go through what we call the I.T. governance committee. Which is not a quick process, so we had to then formally present this…and that took another 6 months.

It was just a request from [the lead clinician] who said, "Oh, we have this application. We're about to sign the contract and now we need to implement"…

The next thing is a vendor calling us, asking us when the servers are going to be ready… And there's a whole confusion.

It was unexpected, I honestly didn't expect that this would be even an issue, you know. So from the get-go had I known I needed to do all these things…

I mean the project itself was never formally approved by any group or team or any process… Even though it's going to be in a clinical space, it was considered research. So I don't think the administrators ever were involved...

The reason I actually [got involved] — somebody emailed me about the project and then I got an email from the CMIO saying that this is important and then I get an email from the former CMIO that now is our CIO saying, "Yeah I support this" — I mean that's all I need. I mean the CIO wants it done. So it is a comedy... but it's typical right.

We had a very long implementation… mostly because our side was being challenging about the contract. I think there was a lot of other stuff going on at the time and so [this system] never was falling to the top of the list of things to get done and contracts are really long and can take a long time.

Technical installation — expect the unexpected
Top tips from your peers:

Technical Installation – Expect the Unexpected

1. There is always more than one I.T. department – identify who you need early.

2. There will be obscure technical issues that come up, unique to your hospital.
   Plan a generous timeline.

3. Don't skimp on the details of logistics – a great system that is inconvenient risks being a
   wasted system.

Source: The author

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Voices of Experience:

Determine who everyone is...identify your key people and key sources of data for your application...where are all the places we're going to need to get data from? We need to get vitals. Well, where do we get those? We need to get lab data — well, who actually has that? Who are our contacts for it? So, identifying those and talking to those people early and getting them kind of bought in in the initial stages.

They already had the carts for our electronic medical record... So the idea was we would just get another mount and put it on back of that and it would be up high and that's great. Well, the cart vendor says, "You know, that's not safe," and "No you can' do that." Then can we get a different kind of cart? "Well, we don't really have the floor space to put another one in there"... So now we're looking and putting it on the [booms above beds] but the vendors said no, that's too unstable.

Because we didn't have the interface with laboratory and with the [admissions] system. That interface, that is a requirement [of the new system], we struggled quite a bit to actually get it established. the struggle was basically with our IT safety...that was a new process, which required creation of an entire project team...

We set the dates for implementation, but there were 1,800 delays because of I.T. barriers and whatnot...There were a lot of questions — just about servers, data capture between the technology they we were using, a frequency of data capture and whatnot, so I remember those being the main barriers to delay.

Our rooms are kind of small — they're small from the standpoint of where we could locate the monitors — they're not in a good spot to be able to utilize them on rounds. So I don't think that they're utilized as much as they could be. ALSO I would say that that's part of the frustration is the location of some of the monitors is not the best place...that's one of the things that I wish we could change because I don't think that it's beneficial for implementation.

Nursing and other frontline staff — involve them from the start and then at every stage

Nursing and Other Frontline Staff – Involve Them From the Start and Then at Every Stage
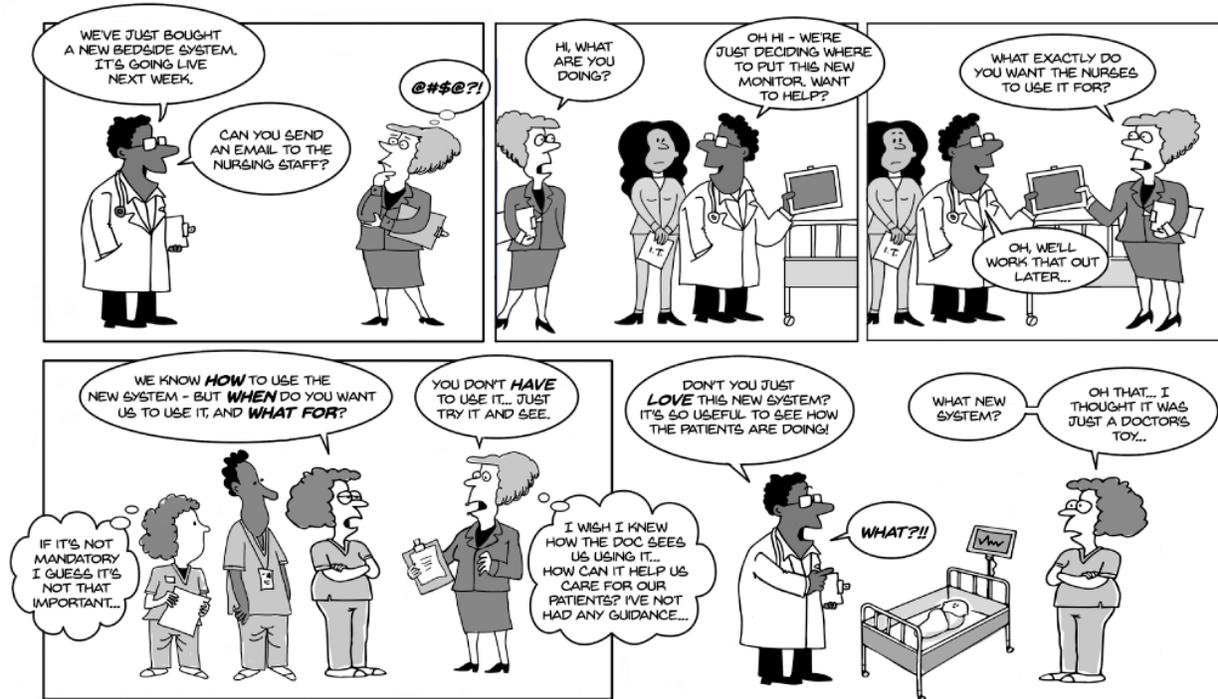
Source: The author

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Don't forget the front line:

· **Involve nursing and frontline staff from the start**: If you're buying a system that you want frontline staff to use, check that nursing leadership agrees that the new system will improve care. Then get them on board as nursing champions.

· **Involve nursing and frontline staff at every stage**: Don't make logistical decisions without front line involvement — a frontline system that is inconvenient to use won't be used.

· **Involve nursing and frontline staff in designing use cases**: Frontline staff won't use a system if they can't see how it helps their patient. Be clear on how the new system will improve care.

Voices of Experience:

We had a nursing contact but really we didn't work with them very much….[nurses] weren't involved and we were starting to look at the education pieces, like it was like "hey we're going live on this."

I think it's primarily a physician / practitioner tool. The bedside nurses… It's going to be there and so they're going to learn how to use it. But…at the beginning now…we don't have any expectations for the nurses.

I would have built a stronger nursing presence into the beginning of it to try to get more buy-in from people and figure out a better way to make sure that the nurses feel actively involved in the process, too, and not just that "This is for the doctors and we have to know what it is and what it does but that's all we really have to know about it."

Often it's like "ta-da, we got this new thing" and it's like "oh that's [MD's] toy…versus "okay, we're going to implement this, we're all going to own it, it's going to meaningful to everyone so what do you think about it?" You know, kind of getting people in before the system is in place but we didn't really do that. So I don't really even think... Most of our nurses don'' use [the system].

So when it went live, [MD] made me aware of it, he gave me access to it, but the nurses aren't necessarily...the nurses don't have access to it…[during rounds] the fellow is in the middle and everybody's kind of like around them so they can see the monitor. The nurses in general are not seeing the new monitoring during rounds unless they ask to see it.

I would say we had almost no role in implementing it. I first heard about IT when it came here, really. I mean, [MD] was like, "We're getting a new thing and it's gonna be great."

Why, how, and when should people use it? Plan out the workflow!
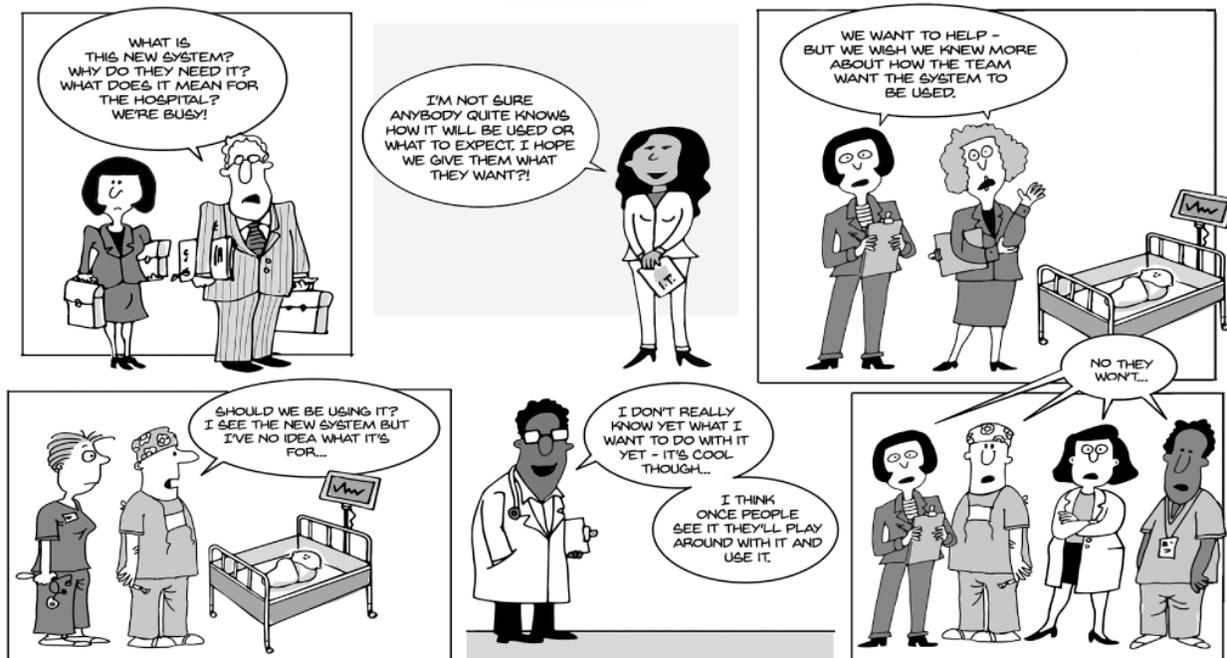
Source: The author
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Plan and communicate:

- **Set goals:** Be clear about what you are trying to accomplish with the system.

- **Why** should busy front line staff care about it?**How** can you excite them about the new system?

- **How** will the system achieve the goals you have set?**Open the black box.**

Voices of Experience:

Now that it's working, now that I've got it in all the rooms, now I can figure out how to utilize it. Once I figure out how to utilize it, where are the strengths and weaknesses, then I can champion it to everyone else.

Once we got it installed, then we started figuring out, trying to devise a plan for how we would roll it out.

I think helping people to understand why it's so important, like why it's so significant, but also being prepared to talk about "okay so it's not replacing you and it's not replacing your judgement and it's not this or that. Here's what it is and here's how it could help." I think crafting that carefully as a group before engaging even the first group of people and then taking it to a broader audience is preferable, it's just time-consuming.

So once we decided [to buy], then when we thought about implementation, putting it in plain-spoken English we said, "Well, we don't want this just to sit and not use it, like we better figure out before it comes here — how we are going to make this useful."

I kept pressing for something that I could give the nurses to say these are the guidelines for using this…. [The docs] didn't have a whole lot of input as to what they expected the bedside nurses to use it for. And it's not that we want to ignore it, because we don't want to ignore it, but we also want to know how is it useful to us. Because I see the many ways that they feel that it is going to be useful to them. But I think we want to be able to use it for what it can be used for to help us give better care to the patients.

On the nursing side of the fence, we were aware the technology was coming. We didn't really have a clear role in its use and therefore we didn't really train anyone on it.

FINALLY: Things that really worked, and other tips:

Voices of Experience:

Basically, we're partners running that unit. She's a nursing director, I'm the medical director. So between the two of us, we've sort of walked the unit and came up with that and we were part of the ones that came up with that initial idea on top of the one and that failed. So we're working together because it's not just a physician unit. We have to make sure the nurses can utilize it and it's not interfering with other care.

I mean we were just really involved in the install and around making sure everything looked good. We're really hands-on kind of people when it comes to implementations. And I think that that worked out well, we didn't ever have to worry that something wasn't on the screen correct, because we saw it for ourselves in the room.

[Have a launch] celebration...You know, more like little snacks or something, and have a room where, we're implementing it today and we're all here in this room for any help, and going out and making it more about really kind of special event and not just relying only on e-mail communication.

A physician champion [was crucial]. I mean, there's no way we could have or should have done this without a physician champion.

[For a new I.T. system to be successful] the business has to be asking for it, so whatever the clinical group is, they have to try it out and they have to say, "We need this, we absolutely want this, we need it, we're willing to invest the time and energy and we're going to use it," and those are the protocols that we'll put in. If you absent that, [it's] just sort of thrusting a system upon a group and saying, "Here, use this is." No one uses it.

Simple Checklist!

- Have you identified all the departments you will need?
e.g., Finance, Procurement, Contracts, Compliance, IT hardware, IT security, IT software, Logistics, Facilities, Administrators, Clinical teams that will use the system

- Have you identified champions from senior clinicians, senior nurses, junior clinicians, and frontline nurses? Do you need to involve other bedside staff?

- Is there a clear implementation timeline with clear roles and responsibilities outlined within the project team?

- Have you included extra time for unforeseen delays?
  If not, you should!

- Is there a clear plan of how the system will be used — and how it will improve care?

- Have you considered piloting the system first to test plans and identify problems?

- How are you and the project team going to advertise the new system and communicate the plan for its use?

Development of This Guide

This booklet (included in the Appendix) was developed in 2017 by Christina Pagel with colleagues in academia, hospitals, and IT companies. Christina is a mathematician and health services researcher at University College London, UK. From 2016–2017, she spent a year in the USA on a Harkness Fellowship in Health Policy and Practice, funded by the Commonwealth Fund.

During this year, she interviewed doctors, nurses, and IT staff at four US hospitals to learn about their experiences of implementation of a clinical IT system over the previous 2 years. She also observed how the IT system was currently being used on the wards.

The cartoons in this guide illustrate themes and situations that arose directly from her analysis of the hospital visits. The quotes come directly from interviews with hospital staff. The guide was shared with interviewees and other experts and feedback incorporated into the final version.

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