# Perils of Customization

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*by Gina Rollins*

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*Increasingly, providers are resisting the temptation to customize software. Many have learned the hard way that unique modifications lead to unique costs and unique complications.*

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We all like to think we're special. But when it comes to implementing software, providers are usually better off going with the flow. Special software modifications that seem helpful at the outset can add significant costs and complications down the road.

Traditionally, most healthcare organizations that bought and implemented IT systems requested special modifications to meet their workflow, reporting, and other requirements—sometimes in small ways and sometimes more extensively. For early adopters, especially, this was necessary given the initial state of the technology.

However, over time both vendors and healthcare organizations have recognized that the customization that fulfills an immediate need often leads to long-term complications and expense. As a result, providers have taken a hard look at what they really need from the information systems they implement, with the goal of avoiding major changes. Meanwhile, vendors have made steady improvements in the standard capabilities of software. As a result, providers now aren't as special as they used to be when it comes to implementing health IT. But in all cases, it still requires planning and vigilance to avoid overly customizing software.

## The Burden of Maintenance

The vendor community characterizes software modifications in two broad categories. Minor changes that don't affect the underlying source code or logic of the software are considered tailoring or configuring—for example, changing a screen in an electronic health record (EHR) to show an organization's most common diagnoses and procedures. This type of change involves retrieving information from a database that is already associated with the screen, and the modification can interface with new releases or updates of the underlying software without special programming or testing.

Customization is a more extensive modification that requires changes to the source code or logic of the software. For example, an organization may request that fields from a research database link to the patient encounter screen of an EHR for a particular group of physicians. The research information resides in one of the existing software databases, but for other customers it is not associated with the encounter page. The vendor must provide special programming to fulfill the request. Modifications must be tested to ensure they function properly and are compatible with each new release of the underlying software.

Once relatively prevalent, customization has fallen out of favor over time. "People have learned lessons the hard way. We've all been burned by customization," says Asif Ahmad, vice president of diagnostic services and chief information officer at Duke University Health System in Durham, NC, and a board member of the National Alliance for Health Information Technology. Customization's main difficulty is the burden that it puts on the healthcare organization to maintain the long-term functionality of the modification.

"As soon as you customize, that software is taken out of the routine cycle of the vendor, and every time they change something you have to make a change [to the customization]," explains Ron Paulus, MD, chief health information technology venture officer and special assistant to the CEO at Geisinger Medical Center in Danville, PA.

Customized modifications don't automatically interface with the product updates and new releases that vendors regularly issue. Links to databases or certain screens may break or cease to work properly, for example. Updating the necessary interface

requires additional programming and testing, often with much of that responsibility falling to the customer. In extreme examples, this process can take on a life of its own.

"Every time we'd get ready to do an upgrade, we'd have to test the functionality of the vanilla upgrade and test each modification to retrofit [it to the upgrade]," explains Ann Ogorzalek, director of information systems at Central DuPage Health in Winfield, IL. The process would take months. Over time, Central DuPage's software became heavily modified, and no one was combing through the new releases to see if they addressed the issues that had led to the original modifications. "It was like a stone that gathered more moss going down hill," Ogorzalek says. That stone got its first push when Central DuPage installed a health information system in 1990. Over time the organization implemented approximately 2,700 modifications.

Aside from making extra work for both vendor and customer, incompatibilities between the customization and new releases can have serious consequences. "If the vendor's core product breaks the customization piece, and [the vendor] assumes things in its implementation that you didn't, then it could pose operational problems or true risk to patients," notes Paulus, who also serves on the interoperability work group of the Certification Commission for Healthcare Information Technology.

The chance of this type of conflict is greater when the vendor is unaware of a modification made by the client. Eva Karp, vice president of providing care operations at Cerner Corporation in Kansas City, MO, offers an example. "We have a custom field in registration that is specific for Canadian requirements," she says. "A US client was using it for another purpose that we had not intended. We enhanced the code to do something else, and it impacted the US client."

## A Costly Matter

The time and resources required to correct those types of glitches have much to do with the movement away from customization. Immediate and long-term costs add up quickly. Up-front costs include time both the customer and vendor must spend understanding the requested change, time spent writing new code or programs to accomplish the customization, and subsequent testing of the modification. Depending on the nature of the customization, training materials and procedures may also require alteration.

However, those costs typically pale in comparison to the ongoing maintenance and testing that must take place after each new release of the overall software package, activities for which the customer often has primary responsibility.

Keeping the customization current with new software releases may require considerable attention from IT staff, diverting them from other priorities. "It's a never-ending problem. You can't use a standard patch and the hospital becomes an IT vendor with a client of one—itself," says Ahmad. More and more organizations have concluded that the process is too costly. "From a financial standpoint, it's not feasible. Why pay millions of dollars for an expensive information product and annual support fees that run between 18 and 22 percent of the original cost and then pay more for the customization?" he asks.

## More Robust Systems, Less Need

Another reason customization is less popular today is that there is less need for it—health information systems are more robust and offer standard features that meet the needs of most organizations, contends Jeff Jasica, senior vice president of implementation services for McKesson Provider Technologies in Louisville, CO.

Hospitals with extensive modifications like Central DuPage were "not atypical of clients" that implemented early EHR systems, he says. "At that time, a high percentage had some customization because it was the only way they could get reports. There was [considerable] customization because the systems didn't have better tools." Jasica estimates that today no more than 5 percent of McKesson's clinical software clients and approximately 10 percent of revenue cycle product installations have customizations that required some type of special programming. A decade ago those numbers may have been as high as 50 percent.

Many vendors have taken pains to beef up their EHR systems by making standard content and tools usable by most organizations and by providing strong report-writing capabilities. They also have improved mechanisms to evaluate change requests from clients to identify common themes. Requests that have broad applicability and meet the vendor's strategic goals are more likely to be included in future software releases that will benefit all customers. "We may not [perform] all requests,

and those we do may be included in one or two releases down the road. Requests with regulatory, financial, patient safety, and quality implications we'll do earlier versus later," explains Cerner's Karp.

Vendors also have invested more in collaborating with clients prior to installing any software, working to understand their needs and educate them about the promise and limits of the technology. "We educate them about optimal workflows and how the software helps optimize workflows. In the paper world, clinicians create work-arounds for things that are not working the way they'd like. If you automate that, you're automating a bad practice," Karp notes.

As more sophisticated software has become available and organizations have struggled to maintain customized products, they have taken concerted efforts to minimize made-to-order software. Duke has focused on "undoing every customization that was done" and working with vendors to incorporate recommended changes in future software releases, says Ahmad. Geisinger has customized certain aspects of its EHR system, but only at defined "break points" where "the vendor understands that at this point in the code customers are doing something outside of it, so they don't change it without considerable notice and customer input," says Paulus.

Central DuPage went through a difficult but ultimately rewarding exercise of unraveling many of its customized elements. "It took a whole multidisciplinary team in and outside of IT to analyze all the modifications that had been made and determine what the idea was behind each customization and whether the new upgrade addressed it," recalls Ogorzalek. The process took about six months, but Central DuPage was able to eliminate approximately two-thirds of the modifications it had made over the years.

Despite the drawbacks, organizations still pursue customization under certain circumstances. "I see it where it's critical to the business charter and clinical process and an existing product doesn't meet needs," says Michael Mytych, principal in Health Information Consulting in Menomonee Falls, WI. McKesson's Jasica notes that some institutions elect to customize because "they have a very unique workflow that they've invested a considerable amount of time standardizing, and it's pervasive and not easily changed." Faith-based providers also may alter selected features to conform with their core beliefs, such as not using contraception. "They customize so users will abide by their practices, and that may not be something the general [software] user population is interested in," Jasica says.

## Avoiding Customization

In the absence of truly special circumstances, customization creeps up on organizations that have weak system and administrative controls, says Ahmad. "It happens when user expectations are not well managed and there's not sufficient discipline in management ranks," he contends.

Even after the grueling effort to rid itself of customization, Central DuPage has to fight the urge to go down that path again. "We still catch ourselves," says Ogorzalek. "Someone will say, 'I wish [the software] did X' and will be reminded by our conscience—usually an IT person—that it would require a modification."

HIM professionals play an important role in discouraging the "we're unique" philosophy that leads to unnecessary customization. Given their expertise in analyzing workflows, Karp says, "they can move the end user past letting their concepts about feature and function get in the way of the end goal. They can get the end user to understand the new automated workflow can be better."

HIM professionals can also "facilitate the consultative phase before implementation, where the vendor brings application functions and assumptions and the customer brings its workflow," says Jasica. "It's a partnership in determining how applications are used, and if you can break down hard and fast stances and understand the process you're digitizing, you can avoid implementing either the process or the technology in a vacuum."

Thoroughly investigating a product prior to purchase is also helpful, because getting the best possible assessment of a product's true capabilities can help prevent the failed expectations that can lead to customization. "Salespeople oversell, and that sets up user expectations," says Ogorzalek. "Then the gotcha comes out during installation." When that happens, staff are disappointed that the software does not do quite what they thought it would, or that it does not do it quite in the way they expected, and they begin requesting customization to meet the expectation.

Visiting other organizations that have installed the application can be a helpful way to get a preview of the product in action. "There's no perfect product out there," Ogorzalek advises, "so it's important to spend time with other people who've put in the software and find out what lessons they learned." HIM professionals can assist in this process during system selection.

Finally, as members of teams evaluating and implementing health IT systems, HIM professionals can be a valuable voice of reason. Paulus reminds product selection teams to step back and take reality checks. "Be careful and thoughtful about the complete long-term cost," he says. "If you feel there's too much customization, consider another software."

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