

Toward a Modular EHR

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Imagine being able to buy just the parts of an EHR system that you need.

The remarkable report “Initial Lessons From the First National Demonstration Project on Practice Transformation to a Patient-Centered Medical Home,” in the May/June *Annals of Family Medicine*,¹ makes this point about the state of primary care information technology (IT): “Technology needed for the PCMH [patient-centered medical home] is not plug and play. ... The hodgepodge of information technology marketed to primary care practices resembles more a pile of jigsaw pieces than components of an integrated and interoperable system.”

Surprise! Well, actually, no surprise. We all recognize that health IT implementation in family medicine

electronic health record (EHR) from a single vendor is a noteworthy recognition of how our changing business models in primary care intersect with a major shift in the health IT market of products and services aimed at primary care practices. It also signals that it’s time for the AAFP to reconsider its recommendation that members adopt comprehensive EHRs.

Modularization of the EHR

The shift from a vendor-centric approach to one that is platform-centric and modular has been described at length in the business and computing literature. Clayton M. Christensen, PhD, the noted Harvard Business School professor and author of several books on innovation, has described this evolution at length, even coining a “law of the conservation of modularity.”

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practices, even under the best conditions and with the best of planning, is difficult and can be an ongoing challenge. What is surprising to me, however, is this comment in the recommendations section of the article (which I’ll call the Nutting Report, after lead author Paul Nutting, MD, MSPH): “...[I]t is possible and sometimes preferable to implement e-prescribing, local hospital system connections, evidence at the point of care, disease registries, and interactive patient Web portals without an EMR.”

This is real wisdom, borne of collective experience placed under the microscope by a study of PCMH demonstration practices. The idea that it is “possible and sometimes preferable” to implement components or modular applications instead of a comprehensive

Christensen explains that in some industries, when the products are relatively new and not very good in terms of performance, the early entrants must provide all of the parts of the product by themselves. For example, if you wanted to be in the computer industry in 1982, you needed to manufacture the computer’s operating system, the application software, the peripheral devices, the processors, etc. Even the cases housing the various components came from a single producer. The product was “vertically integrated.” IBM, Digital Equipment, Unisys and Wang were all companies from whom customers had to buy the entire package, including consulting. But over time, as the performance of the product improves, the vertically integrated, highly proprietary companies whose approach was

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WHAT DO YOU THINK?

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strongest during the early phases of the industry's development give way to non-integrated and horizontally stratified companies whose products are capable of integrating through standards, not by virtue of a single company's owning all the components. Christensen says this "looks like the industry got pushed through a bologna slicer."²

This happens because the basis of competition changes. Customers become less willing to reward further slow improvements in functionality (for example, adding a registry on to an existing EHR, as described in the Nutting Report) by paying premium prices. Companies that get better at giving customers exactly what they want (for example, e-prescribing or a registry) when they want it and at an affordable price earn attractive profit margins. And they take business away from the vertically integrated firms.

Modularity, in effect, enables the dis-integration of the industry. This is exactly what happened in the computer industry. By 2002, virtually every part of a PC was modular and substitutable – and many of the leading computer manufacturers of 1982, including three mentioned earlier, had gone out of business. During the same period, Dell grew to dominate the industry without manufacturing anything, simply purchasing microprocessors, memory, hard disks, etc., and assembling them according to the wants and needs of the customer.

What's happening in today's EHR industry is analogous. Vertically integrated, top-tier companies such as Allscripts, GE Centricity and NextGen would like to continue to sell comprehensive EHRs to their best customers, who will pay their highest prices at maximum profit margins, often greater than 50 percent. But they are struggling to add value fast enough and at a price individual practices can afford. The proof is seen in examples throughout the Nutting Report and in countless practices across the country as users try to get vertically integrated vendors to respond quickly to their functionality needs but find the workarounds and awkward installations maddeningly frustrating. EHR users are screaming for the features they need but getting a lot they don't need, at prices that seem like extortion.

In brief, we doctors have arrived at a next stage of value addition for EHR technology, one at which faster response, greater agility, convenience and lower pricing have become as important as or more important than a very long list of features and functions that are no longer as useful or desirable as they once were perceived to be.

Transition and instability

Let's repeat the Nutting quotation, seeing it now as a new value statement: "...[I]t is possible and sometimes preferable to implement e-prescribing, local hospital system connections, evidence at the point of care, disease registries, and interactive patient Web portals without an EMR."

This is an explicit recognition of a sharpening focus on the capabilities most important for primary care IT, and a call for us all to recognize that circumstances have changed. Implied by this new value statement is that these components ought to be plug and play. Makes perfect sense. Modularize and integrate through standard interfaces. Emulate the iPhone applications and Google Health. Drs. Ken Mandl and Isaac Kohane recently described in the *New England Journal of Medicine*³ the potential virtues of an "interoperable and substitutable" platform for EHR components, so the idea certainly has other adherents.

And yet right now, most of these components are *not* plug and play. The market is in a state of transition, but not yet stable. In fact, it's worse than unstable. Top-tier vendors like Allscripts and GE Centricity are digging in and fighting the shift to plug-and-play modularity. They're doing this primarily through the Healthcare Information and Management Systems Society, which is lobbying hard to lock in federal policy that will discriminate against new entrants into the EHR market.

As reported in the *Washington Post*, they want the Office of the National Coordinator for Health Information Technology to mandate that incentive payments under the Health Information Technology for Economic and Clinical Health (HITECH) Act can go only to EHRs certified by the Certification Commission for Healthcare Information Technology (CCHIT) – that is, comprehensive applications from single vendors.⁴

The AAFP is caught in the middle, supporting CCHIT but also encouraging the government to open the door to innovation by allowing physicians to qualify for incentive payments if they adopt components of EHR technology – precisely the ones mentioned in the Nutting Report. It may, however, be time for the AAFP to take a more deliberate approach, one that recognizes the experience reflected in the Nutting Report and tries to accelerate the rate at which modular and component EHR technology becomes interoperable and substitutable, i.e., plug and play.

How the transition to plug-and-play technology will work out, only time will tell. A transition seems both inevitable and likely to make life easier for practices of all sizes. In the meantime, the health care IT marketplace will continue to be an uncomfortable place for everyone. **FPM**

Send comments to fpmedit@aafp.org.

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