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Healthcare Informatics

June/July 2012

Volume 29, Number 6

Healthcare IT Leadership, Vision & Strategy

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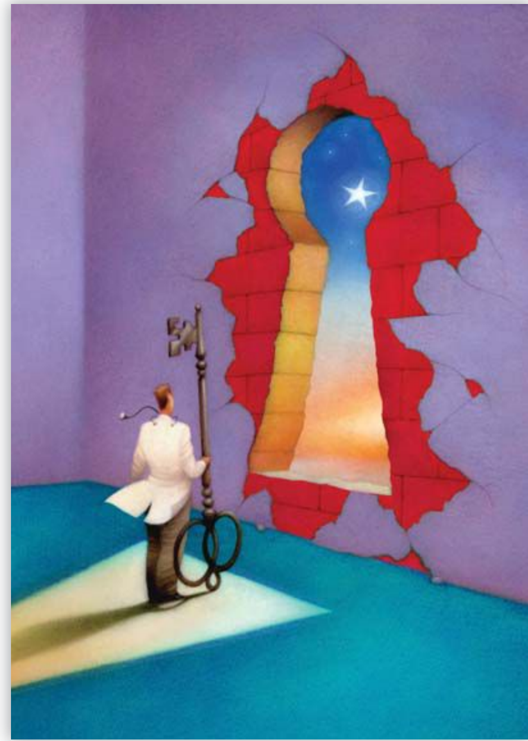

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Are you travelling at one million miles an hour? You might be surprised you are

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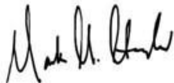
Leveraging the Power of Our Print and Online Channels

It's an exciting time to be part of the healthcare information technology industry! The *Healthcare Informatics* editorial staff continues to provide industry-leading content in the print edition of our magazine, on our website, via social media vehicles, and at live, in-person events. We receive constant feedback from our audience and, based on that feedback, it is my pleasure to update you on some exciting new developments at *Healthcare Informatics* and some game-changing plans we've put in place for the remainder of 2012.

As you may know, we re-launched our website, www.healthcare-informatics.com, in January. Since that time, we've seen steady growth in the number of visitors to the website each month, and a nearly a 50-percent increase in the number of online page views over the same time period last year. Based on those metrics and the media consumption patterns of our audience, we have made the decision to dedicate our editorial resources to providing even more online content.

By reducing our print frequency of *Healthcare Informatics* by three issues, the *HCI* editorial staff will have the freedom to grow its in-depth analysis of HIT industry news and developments, without the time constraints mandated by a print production schedule. Throughout the rest 2012 you will see an increase in dedicated online reporting from industry events such as the annual meetings of the Medical Group Management Association and the Radiological Society of North America, increased analysis of signature issues like the Healthcare Informatics 100, and more targeted online content for clinical informatics professionals.

On behalf of the *Healthcare Informatics* editorial team, I thank you for your continued support and your invaluable input.



Mark Hagland
Editor-in-Chief

MORE ONLINE
Latest in-depth analysis of the Healthcare Informatics 100, plus exclusive coverage of the HCI Executive Summit. Also: California shifts its HIE leadership; optimizing medication management through automation; how meaningful use encourages e-prescribing; the role of personal health records and addiction treatment; extending the electronic health record to independent hospitals and clinics; cloud-based PACS; virtual patient simulation, and more.

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Are You Travelling at One Million Miles an Hour?

YOU MIGHT BE SURPRISED TO KNOW YOU ARE

Mark Hagland

While web-searching science-related articles recently, I came across a truly entertaining and thought-provoking blog from May 2009 with the irresistible headline, "I'm Not Just Sitting Here Being Lazy… I'm Travelling at 1,000,000 Miles Per Hour." (http://www.washingtonsblog.com/2009/05/im-not-just-sitting-here-being-lazy-im-travelling-at-1000000-miles-per-hour.html) Now, who could pass by a headline like that and not want to dip in and read it?

Well, as the article explains, it turns out that there is a region of the universe called the "Great Attractor," which is a region of space in the Centaurus Supercluster, which encompasses a mass tens of thousands of times greater than our own Milky Way galaxy. What scientists have discovered is that the Great Attractor has such a massive gravitational pull that it is pulling our entire galaxy and all of the nearby galaxies towards it at a speed of a million miles an hour. And here you just thought you were lounging on your couch watching a college basketball game, right?

As the science blog *Washington's Blog* points out, "We don't feel any movement because everything on Earth and in our galaxy is moving at the same speed. In other words, we don't feel the movement for the same reason that we don't feel the Earth rotate: everything around us is rotating at the same time." And the author adds humorously, "So don't call me lazy…I'm moving at a million miles per hour."

I know for a fact that many of our magazine's readers feel they're currently moving at the rate of a million miles per hour, given all the mandates and obligations they're facing right now, as well as the pace of change that's overtaken the entire industry.

In fact, new developments are taking place at a mind-numbing rate these days in healthcare, leading even the most driven CIOs, CMIOs, and other healthcare leaders to feel overwhelmed at times. And sometimes, it all feels too much.

But if one steps back a bit, one can see many good things happening. And one of the very positive overall developments is the current acceleration in innovation on the part of healthcare IT vendors, whose executives and developers are creating new IT solutions and applications and improving existing ones, at quite a dramatic pace. These vendors are responding to many elements in their environment, from federal policy mandates around healthcare reform and the meaningful use process, to demands from provider organizations for smarter, better solutions for their clinicians and staffs, to pure capitalist growth opportunities.

What I find particularly interesting and encouraging is the degree to which these healthcare IT innovations are being developed by vendor companies of all sizes, shapes, and types, from industry-giant behemoths to very modest startups armed with a few smart people and one or more very smart ideas.

We at *Healthcare Informatics* are of course committed to covering innovations coming from every type of vendor organization, from the largest to the smallest. In that regard, we're proud, as always, to present to our readers our annual Healthcare Informatics 100, the uniquely authoritative compendium of healthcare IT vendors by revenue that we publish every year. And we're also once again delighted to share with our readers the stories of several "Up and Comers," smaller vendor organizations that are making waves for their innovations and growing success, as well as our three annual "Most Interesting Vendors" feature stories.

Along with all of our other important features and department stories this issue, we hope you will especially enjoy and benefit from our Healthcare Informatics 100. Happy reading!

Mark Hagland
Editor-in-Chief

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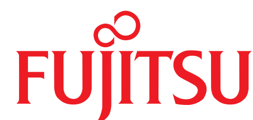

THE HEALTHCARE INFORMATICS 100

COMPANIES BY REVENUE

Our Annual Ranking of Healthcare IT Vendors

Healthcare Informatics, which in each and every issue provides leadership and strategy for healthcare IT leaders, is proud to present the 2012 version of its unique industry offering: the Healthcare Informatics 100, a compilation of the top health IT companies based on HIT revenues from the most recent fiscal year.

The HCI 100 provides a complete listing of the top 100 revenue-earning companies in the industry. Any company that can identify its HIT-based revenues is eligible to submit its figures. In addition to this year's and last year's ranking, the list provides healthcare IT revenues for the last three fiscal years and M&A activity during the most recent fiscal year.

For this year's list, McKesson Technology Solutions (Alpharetta, Ga.) was the top-ranked company, marking the fifth year in a row that the diversified healthcare IT software solutions vendor has sat atop the list. Ranking second was the Round Rock, Texas-based Dell, Inc., a provider of IT outsourcing, revenue cycle services, and data centers to the healthcare industry. Rounding out the top five, untouched from last year's list, are CareFusion Corp., (San Diego, Calif.), Philips Healthcare (Andover, Mass.), and Cerner Corp. (Kansas City, Mo.).

Our cover story package includes profiles of this year's Most Interesting Vendors—MedeAnalytics, Orion Health, and Greenway Medical—each of which has an interesting story to tell in terms of market strategy (page 34); and our Up and Comers report on five smaller companies that should be on everyone's radar (page 40). In addition, beginning on page 32, Ben Rooks provides his perspective on 2011's deals in his mergers and acquisitions report. Completing this section is a feature story on vendor contract strategies (page 46).

To formulate this list, the *HCI* editorial staff worked with two market research and analysis companies: Porter Research (Atlanta) and ST Advisors (San Francisco). Details on the methodology they used are on the facing page.

Thank you, and enjoy.

The *HCI* Editors

HCI 100

Our Methodology and Experts

As previously, two firms were instrumental in compiling, editing, and reviewing the 2011 revenue figures for this year's Healthcare Informatics 100 issue, Porter Research and ST Advisors.

➢ The sales figures were compiled and reviewed by Porter Research, which consulted with both its staff and other business partners to ensure inclusion of the deserving companies, as well as fairness in their reporting.

➢ For those firms that did not disclose their sector-specific revenues, Porter, working with ST Advisors, sought to estimate data based on patterns of previous years' revenue arcs derived from industry press releases and unrelated healthcare industry consultants. We believe these estimates present a fair approximation of those firms' influence and rankings in today's corporate healthcare information technology environment.

Atlanta-based Porter Research (www.PorterResearch.com), an affiliate of Billian Inc. and sister company to Billian's HealthDATA, provides go-to market research services to generate quantitative and qualitative knowledge of market opportunities, customer loyalty and experience, win-loss sales analysis, and brand awareness, among other offerings. Cynthia Porter, president of Porter Research, is an experienced healthcare technology executive with more than 25 years of experience in all disciplines of the healthcare market—payers, providers, and vendors.

ST Advisors (www.st-advisors.com) offers both long-term and project-based relationships to HCIT companies and financial sponsors. Founder Ben Rooks worked as both a healthcare IT equity research analyst and investment banker for close to two decades. He is also a member of *Healthcare Informatics'* editorial board.

Thank you to Cynthia, Ben, and their colleagues for their time and input in assembling this year's compendium.

1 '12 / **1** '11

McKesson Technology Solutions* | Alpharetta, GA | www.mckesson.com

HIT Revenue: $3,280,200,000 (11) **$3,124,000,000 (10)** **$3,064,000,000 (09)**
M&A 2011: Portico Systems; SystemsC
*Revenue estimate.

2 '12 / **2** '11

Dell, Inc.* | Round Rock, TX | 800-289-3355 | content.dell.com/us/en/healthcare/healthcare-solutions.aspx

HIT Revenue: $2,756,250,000 (11) **$2,625,000,000 (10)** **$2,500,000,000 (09)**
Major Revenue: 8% Software; 47% Hardware; 45% Services
*Revenue estimate.

3 '12 / **3** '11

CareFusion Corp. | San Diego, CA | 888-876-4287 | www.carefusion.com

HIT Revenue: $2,700,000,000 (11) **$2,600,000,000 (10)** **$2,400,000,000 (09)**
M&A 2011: Vestara, 4/11; OnSite Services (Divested), 3/11; Rowa, $150,000,000

4 '12 / **4** '11

Philips Healthcare | Andover, MA | 800-285-5585 | www.healthcare.philips.com

HIT Revenue: $2,500,000,000 (11) **$2,400,000,000 (10)** **$787,000,000 (09)**

5 '12 / **5** '11

Cerner Corp. | Kansas City, MO | 816-221-1024 | www.cerner.com

HIT Revenue: $2,200,000,000 (11) **$1,850,000,000 (10)** **$1,670,000,000 (09)**
Major Revenue: 21% Software; 11% Hardware; 68% Services
M&A 2011: Clairvia, 10/11; Resource Systems, 5/11

6 '12 / **10** '11

Cognizant | Teaneck, NJ | 201-801-0223 | www.cognizant.com

HIT Revenue: $1,622,156,908 (11) **$1,177,085,193 (10)** **$860,427,276 (09)**
Major Revenue: 100% Services

7 '12 / **6** '11

Siemens Healthcare* | Malvern, PA | 888-826-9702 | usa.siemens.com/soarian

HIT Revenue: $1,600,000,000 (11) **$1,600,000,000 (10)** **$1,400,000,000 (09)**
M&A 2011: MobileMD, 11/11
*Revenue estimate.

8 '12 / **7** '11

NTT Data, Inc. (formerly Keane) | Boston, MA | 800-699-6773 | www.nttdata.com/americas

HIT Revenue: $1,500,000,000 (11) **$1,400,000,000 (10)** **$178,000,000 (09)**
Major Revenue: 25% Software; 2% Hardware; 73% Services

9 '12 / **13** '11

Allscripts Healthcare Solutions, Inc. | Chicago, IL | 800-654-0889 | www.allscripts.com

HIT Revenue: $1,444,000,000 (11) **$928,819,000 (10)** **$661,157,000 (09)**
Major Revenue: 17% Software; 83% Services

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10 '12 | 8 '11 — CSC | Falls Church, VA | 703-876-1000 | www.csc.com

HIT Revenue: $1,223,000,000 (11) $1,334,000,000 (10) $1,566,000,000 (09)
Major Revenue: 1.5% Software; 98.5% Services
M&A 2011: iSoft, 7/11; Image Solutions, Inc., 9/11

11 '12 | 9 '11 — Cegedim (U.S. Subsidiary: Pulse Systems, Inc.) | Wichita, KS | 800-444-0882 | www.pulseinc.com; www.cegedim.com

HIT Revenue: $1,215,250,000 (11) $1,232,511,000 (10) $1,162,553,000 (09)
Major Revenue: 35% Software; 65% Services

12 '12 | 12 '11 — Epic Systems Corp. | Verona, WI | 608-271-9000 | www.epic.com

HIT Revenue: $1,190,000,000 (11) $825,000,000 (10) $650,000,000 (09)
Major Revenue: 60% Software; 40% Services

13 '12 | 17 '11 — Optum | Eden Prairie, MN | 800-765-6713 | www.optum.com

HIT Revenue: $1,150,000,000 (11) $460,000,000 (10) $430,000,000 (09)
Major Revenue: 80% Software; 20% Services
M&A 2011: Connextions

14 '12 | 11 '11 — Emdeon Inc. | Nashville, TN | 615-932-3000 | www.emdeon.com

HIT Revenue: $1,119,648,000 (11) $1,002,152,000 (10) $918,448,000 (09)
Major Revenue: 97% Software; 3% Services
M&A 2011: EquiClaim, $40,000,000

15 '12 | 14 '11 — EMC Corp.* | Hopkinton, MA | 508-435-1000 | www.emc.com

HIT Revenue: $900,000,000 (11) $700,000,000 (10) $500,000,000 (09)
Major Revenue: 40% Software; 40% Hardware; 20% Services
*Revenue estimate.

16 '12 | 27 '11 — Infosys Ltd. | Plano, TX | 469-229-9400 | www.infosys.com

HIT Revenue: $614,000,000 (11) $414,600,000 (10) $325,000,000 (09)
Major Revenue: 1% Software; 99% Services

17 '12 | 16 '11 — The TriZetto Group, Inc. | Denver, CO | 800-569-1222 | www.trizetto.com

HIT Revenue: $570,442,648 (11) $518,000,000 (10) $490,000,000 (09)
Major Revenue: 45% Software; 55% Services
M&A 2011: Gateway EDI

18 '12 | 29 '11 — Science Applications International Corp. | McLean, VA | 888-886-5909 | www.saic.com/health

HIT Revenue: $554,419,000 (11) $394,450,000 (10) $376,270,000 (09)
Major Revenue: 100% Services
M&A 2011: Vitalize Consulting Solutions, 8/11

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19 '12 | 18 '11

Medical Information Technology, Inc. (MEDITECH) | Westwood, MA | 781-821-3000 | www.meditech.com

HIT Revenue: $545,200,000 (11) $459,098,000 (10) $393,025,014 (09)

20 '12 | 19 '11

Nuance Communications, Inc. | Burlington, MA | 781-565-5000 | www.nuance.com

HIT Revenue: $526,800,000 (11) $449,300,000 (10) $392,000,000 (09)
M&A 2011: Webmedx, 6/11

21 '12 | 20 '11

3M Health Information Systems* | Salt Lake City, UT | 800-367-2447 | www.3Mhis.com

HIT Revenue: $471,352,350 (11) $448,907,000 (10) $425,627,000 (09)
Major Revenue: 81% Software; 1% Hardware; 18% Services
*Revenue estimate.

22 '12 | 26 '11

M*Modal, Inc. (Formerly MedQuist Holdings Inc.) | Franklin, TN | 615-798-6000 | www.mmodal.com

HIT Revenue: $443,800,000 (11) $417, 326,000 (10) $353,932,000 (09)
Major Revenue: 9% Software; 91% Services
M&A 2011: Merged with M*Modal, 8/11, $108,000,000

23 '12 | 21 '11

GE Healthcare** | Chalfont St. Giles, UK | www.gehealthcare.com

**Industry analysis estimates rank company in top quartile.

24 '12 | 22 '11

IBM** | Armonk, NY | www.ibm.com

**Industry analysis estimates rank company in top quartile.

25 '12 | 25 '11

Oracle** | Redwood Shores, CA | 800-392-2999 | www.oracle.com

**Industry analysis estimates rank company in top quartile.

26 '12 | Not Ranked '11

Northrop Grumman Corp. | McLean, VA | 703-556-1327 | www.northropgrumman.com/healthit

HIT Revenue: $441,000,000 (11) $417,000,000 (10) $407,000,000 (09)
Major Revenue: 21% Software; 4% Hardware; 75% Services

27 '12 | 28 '11

TELUS Health Solutions | Longueuil, QC, Canada | 450-928-6000 | www.telushealth.com

HIT Revenue: $420,000,000 (11) $403,000,000 (10) $343,429,000 (09)
Major Revenue: 75% Software; 20% Hardware; 5% Services

28 '12 | 32 '11

NextGen Healthcare Information Systems, Inc.* | Horsham, PA | 215-657-7010 | www.nextgen.com

HIT Revenue: $353,000,000 (11) $334,768,000 (10) $262,900,000 (09)
Major Revenue: 30% Software; 2% Hardware; 68% Services
M&A 2011: CQI Solutions
*Revenue estimate.

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29 '12 | 23 '11 — Lawson Software, Inc. | St. Paul, MN | 800-477-1357 | www.lawson.com

HIT Revenue: $330,000,000 (11)
Major Revenue: 80% Software; 20% Services

30 '12 | 34 '11 — InterSystems Corp. | Cambridge, MA | 617-621-0600 | www.InterSystems.com

HIT Revenue: $327,250,000 (11) **$281,000,000 (10)** **$231,200,000 (09)**
Major Revenue: 65% Software; 35% Services

31 '12 | 38 '11 — athenahealth, Inc. | Watertown, MA | 888-652-8200 | www.athenahealth.com

HIT Revenue: $324,000,000 (11) **$245,500,000 (10)** **$188,500,000 (09)**
Major Revenue: 100% Software
M&A 2011: Proxys, $36,000,000

32 '12 | Not Ranked '11 — NetApp, Inc. | Sunnyvale, CA | 408-822-6000 | www.netapp.com/healthcare

HIT Revenue: $300,000,000 (11) **$230,000,000 (10)**
Major Revenue: 14% Software; 66% Hardware; 20% Services

33 '12 | 35 '11 — SAS | Cary, NC | 919-531-8000 | www.sas.com

HIT Revenue: $299,251,649 (11) **$270,638,200 (10)** **$244,700,000 (09)**
Major Revenue: 85% Software; 15% Services

34 '12 | 36 '11 — HealthPort Technologies, LLC | Alpharetta, GA | 800-737-2585 | www.healthport.com

HIT Revenue: $255,535,000 (11) **$232,389,000 (10)** **$259,816,000 (09)**
Major Revenue: 50% Software; 50% Services
M&A 2011: Universata, 6/11

35 '12 | 48 '11 — Merge Healthcare | Chicago, IL | 312-565-6868 | www.merge.com

HIT Revenue: $237,000,000 (11) **$140,322,000 (10)** **$66,841,000 (09)**
Major Revenue: 34.8% Software; 47.2% Hardware; 18% Services
M&A 2011: Ophthalmic Imaging Systems, 8/11, $30,000,000

36 '12 | 37 '11 — Vitera Healthcare Solutions* (formerly Sage Healthcare Division) | Tampa Bay, FL | 877-932-6301 | www.viterahealthcare.com

HIT Revenue: $233,913,600 (11) **$251,520,000 (10)**
M&A 2011: Vista Equity Partners acquired Sage Healthcare Div. and changed name to Vitera, 11/11
*Revenue estimate.

37 '12 | 30 '11 — MedAssets, Inc. | Alpharetta, GA | 678-248-8194 | www.medassets.com

HIT Revenue: $214,275,000 (11) **$213,728,000 (10)** **$178,721,000 (09)**
Major Revenue: 70% Software; 30% Services

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38 '12 / 44 '11

eClinicalWorks | Westborough, MA | 866-888-6929 | www.eclinicalworks.com

HIT Revenue: $210,487,000 (11) **$152,481,473 (10)** **$105,882,637 (09)**
Major Revenue: 70% Software; 30% Services

39 '12 / 41 '11

Kronos Inc. | Chelmsford, MA | 978-250-9800 | www.kronos.com

HIT Revenue: $198,900,000 (11) **$174,000,000 (10)** **$168,000,000 (09)**

40 '12 / 40 '11

Sunquest Information Systems, Inc.* | Tucson, AZ | 800-748-0692 | www.sunquestinfo.com

HIT Revenue: $183,225,000 (11) **$174,500,000 (10)** **$164,700,000 (09)**
*Revenue estimate.

41 '12 / 55 '11

maxIT Healthcare | Westfield, IN | 877-652-4099 | www.maxithc.com

HIT Revenue: $179,000,000 (11) **$110,000,000 (10)** **$68,000,000 (09)**
Major Revenue: 100% Services
M&A 2011: Acumen Technology Solutions for Healthcare, LLC, 7/11

42 '12 / 46 '11

QuadraMed Corp. | Reston, VA | 703-709-2300 | www.quadramed.com

HIT Revenue: $174,000,000 (11) **$149,000,000 (10)** **$145,000,000 (09)**
Major Revenue: 35% Software; 65% Services
M&A 2011: NCR Healthcare Solutions (A Division of NCR Corporation), 12/11

43 '12 / 45 '11

Computer Programs and Systems, Inc. (CPSI) | Mobile, AL | 800-711-2774 | www.cpsinet.com

HIT Revenue: $173,476,344 (11) **$153,247,000 (10)** **$127,742,000 (09)**
Major Revenue: 22% Software; 8% Hardware; 70% Services

44 '12 / 51 '11

The Advisory Board Company | Washington, DC | 202-266-5600 | www.advisory.com

HIT Revenue: $170,000,000 (11) **$124,381,800 (10)** **$104,454,900 (09)**
Major Revenue: 100% Software
M&A 2011: PivotHealth LLC , 8/11

45 '12 / 52 '11

E*HealthLine.com, Inc. | Sacramento, CA | 916-924-8092 | www.ehealthline.com

HIT Revenue: $169,000,000 (11) **$155,000,000 (10)** **$101,000,000 (09)**
Major Revenue: 50% Software; 10% Hardware; 40% Services

46 '12 / 42 '11

Anthelio Healthcare Solutions Inc. | Dallas, TX | 214-257-7000 | www.antheliohealth.com

HIT Revenue: $168,000,000 (11) **$149,000,000 (10)**
Major Revenue: 100% Services

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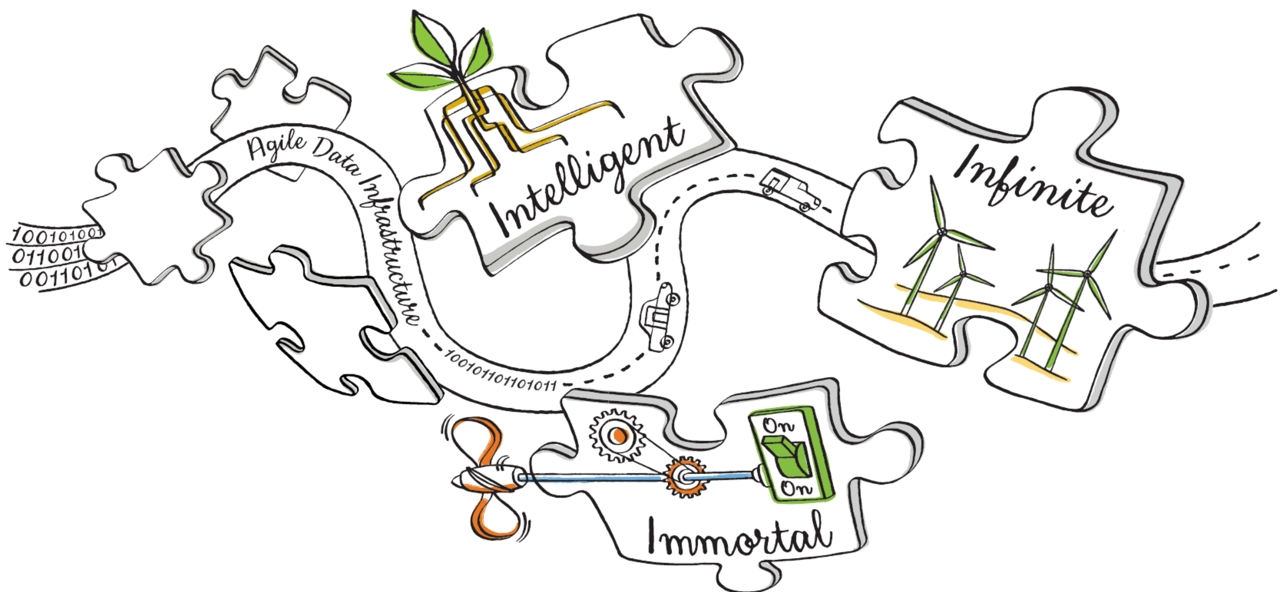

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47 '12 / 43 '11 — CareTech Solutions | Troy, MI | 877-700-8324 | www.caretech.com

HIT Revenue: $157,800,000 (11) **$154,035,000 (10)** **$151,400,000 (09)**
Major Revenue: 10% Software; 4% Hardware; 86% Services

48 '12 / 47 '11 — MED3000 | Pittsburgh, PA | 412-937-8887 | www.med3000.com

HIT Revenue: $155,468,612 (11) **$144,257,942 (10)** **$136,347,275 (09)**
Major Revenue: 55% Software; 1% Hardware; 44% Services

49 '12 / 54 '11 — HealthTech Holdings, Inc. | Nashville, TN | 615-383-7300 | www.healthtechholdings.com

HIT Revenue: $155,000,000 (11) **$110,217,182 (10)** **$77,148,773 (09)**
Major Revenue: 29% Software; 19% Hardware; 52% Services

50 '12 / 84 '11 — Amcom Software, Inc., subsidiary of USA Mobility, Inc. | Springfield, VA | 800-852-8935 | www.amcomsoftware.com

HIT Revenue: $145,935,000 (11) **$34,000,000 (10)** **$24,000,000 (09)**
Major Revenue: 85% Software; 1% Hardware; 14% Services
M&A 2011: Amcom Software, 3/11

51 '12 / 50 '11 — Elsevier | Philadelphia, PA | 215-239-3900 | www.elsevier.com

HIT Revenue: $140,000,000 (11) **$125,000,000 (10)** **$121,000,000 (09)**
Major Revenue: 97% Software; 3% Services

52 '12 / 57 '11 — Availity, LLC | Jacksonville, FL | 800-282-4548 | www.availity.com

HIT Revenue: $133,000,000 (11) **$100,000,000 (10)** **$75,000,000 (09)**
Major Revenue: 100% Software

53 '12 / 56 '11 — SXC Health Solutions Corp. | Lisle, IL | 630-577-3100 | www.sxc.com

HIT Revenue: $116,255,000 (11) **$106,789,000 (10)** **$102,700,000 (09)**
Major Revenue: 10% Software; 5% Hardware; 85% Services
M&A 2011: PTRX, 10/11; MedMetrics, 6/11

54 '12 / 62 '11 — Syntel, Inc. | Troy, MI | 248-619-2800 | www.syntelinc.com/healthcare

HIT Revenue: $113,029,468 (11) **$79,299,905 (10)** **$61,546,688 (09)**
Major Revenue: 100% Services

55 '12 / 53 '11 — SCC Soft Computer | Clearwater, FL | 727-789-0100 | www.softcomputer.com

HIT Revenue: $110,140,868 (11) **$107,784,025 (10)** **$97,700,000 (09)**
Major Revenue: 50% Software; 20% Hardware; 30% Services

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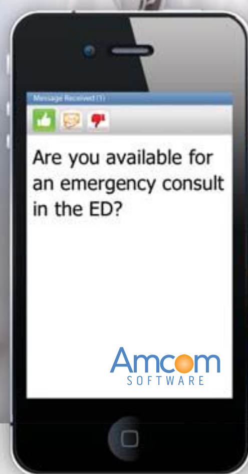

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56 '12 / 60 '11 — Netsmart Technologies | Overland Park, KS | 800-472-5599 | www.ntst.com

HIT Revenue: $110,000,000 (11) $90,000,000 (10) $83,400,000 (09)
Major Revenue: 70% Software; 20% Hardware; 10% Services

57 '12 / 59 '11 — Apollo Health Street | Clifton, NJ | 973-405-5002 | www.apollohealthstreet.com

HIT Revenue: $105,000,000 (11) $95,000,000 (10) $99,000,000 (09)
Major Revenue: 100% Services

58 '12 / 57 '11 — NEC Corporation of America | Irving, TX | 214-262-6400 | www.necelevateperformance.com/healthcare.asp

HIT Revenue: $100,000,000 (11) $100,000,000 (10) $90,000,000 (09)
Major Revenue: 30% Software; 50% Hardware; 20% Services

59 '12 / 65 '11 — Computer Task Group, Inc. | Buffalo, NY | 716-882-8000 | www.ctg.com

HIT Revenue: $97,652,897 (11) $66,080,019 (10) $45,876,440 (09)
Major Revenue: 100% Services

60 '12 / 69 '11 — Hyland Software, Inc. | Westlake, OH | 440-788-5000 | www.hyland.com

HIT Revenue: $95,237,154 (11) $64,993,000 (10) $42,859,000 (09)
Major Revenue: 82% Software; 18% Services

61 '12 / 62 '11 — Greenway Medical Technologies, Inc. | Carrollton, GA | 770-262-2347 | www.greenwaymedical.com

HIT Revenue: $89,839,000 (11) $64,600,000 (10) $48,700,000 (09)
Major Revenue: 29% Software; 7% Hardware; 64% Services
M&A 2011: CySolutions, 10/11, $4,000,000

62 '12 / Not Ranked '11 — IOD Inc. | Green Bay, WI | 800-236-3355 | www.iodincorporated.com

HIT Revenue: $83,000,000 (11) $61,000,000 (10) $59,000,000 (09)
Major Revenue: 100% Services
M&A 2011: Medical Executive Coding & Auditing, LLC and Health Sciences Institute, 4/11

63 '12 / 66 '11 — HealthStream, Inc. | Nashville, TN | 615-301-3100 | www.healthstream.com

HIT Revenue: $82,100,000 (11) $65,800,000 (10) $57,400,000 (09)
Major Revenue: 100% Software

64 '12 / Not Ranked '11 — Enterasys Networks | Andover, MA | 978-684-1000 | www.enterasys.com

HIT Revenue: $80,000,000 (11) $70,000,000 (10) $60,000,000 (09)
Major Revenue: 10% Software; 60% Hardware; 30% Services

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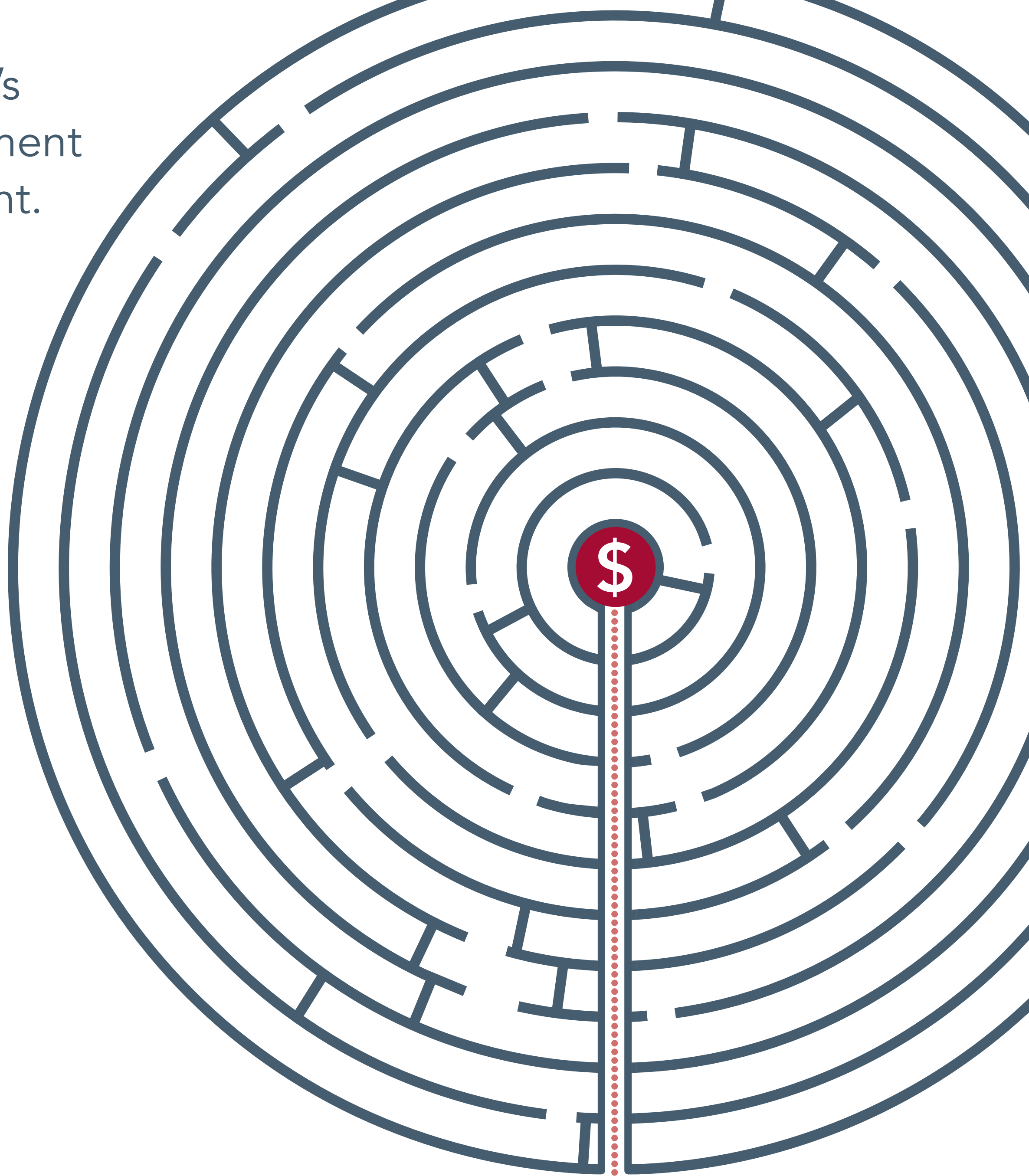

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65 '12 / 76 '11 Vocera Communications, Inc. | San Jose, CA | 408-882-5656 | www.vocera.com

HIT Revenue: $79,000,000 (11) $56,900,000 (10) $41,100,000 (09)

66 '12 / 63 '11 Passport Health Communications, Inc. | Franklin, TN | 615-661-5657 | www.passporthealth.com

HIT Revenue: $78,580,870 (11) $72,939,441 (10) $69,214,734 (09)
Major Revenue: 97% Software; 3% Hardware; <1% Services

67 '12 / 64 '11 Orion Health | Santa Monica, CA | 800-905-9151 | www.orionhealth.com

HIT Revenue: $78,200,000 (11) $68,000,000 (10) $37,816,000 (09)
Major Revenue: 39.7% Software; 55.4% Services

68 '12 / 73 '11 Zynx Health* | Los Angeles, CA | 310-954-1950 | www.zynxhealth.com

HIT Revenue: $74,000,000 (11) $60,000,000 (10) $45,000,000 (09)
Major Revenue: >95% Hardware; <5% Services
*Revenue estimate.

69 '12 / 85 '11 Perficient, Inc. | St. Louis, MO | 314-529-3600 | www.perficient.com

HIT Revenue: $70,848,000 (11) $38,434,185 (10) $34,075,120 (09)
Major Revenue: 5% Software; 5% Hardware; 90% Services
M&A 2011: Exervio, 4/11; JCB Partners,7/11

70 '12 / 61 '11 MedeAnalytics, Inc.* | Emeryville, CA | 510-379-3300 | www.medeanalytics.com

HIT Revenue: $70,000,000 (11) $80,000,000 (10) $70,000,000 (09)
Major Revenue: 90% Software; 10% Services
*Revenue estimate.

70 '12 / 72 '11 API Healthcare Corp.* | Hartford, WI | 262-673-6815 | www.apihealthcare.com

HIT Revenue: $70,000,000 (11) $60,950,000 (10) $53,000,000 (09)
M&A 2011: Concerro
*Revenue estimate.

72 '12 / 67 '11 Healthland* | Minneapolis, MN | 800-323-6987 | www.healthland.com

HIT Revenue: $65,000,000 (11) $60,000,000 (10) $60,194,528 (09)
Major Revenue: 20% Software; 14% Hardware; 66% Services
*Revenue estimate.

73 '12 / 79 '11 ZirMed Inc. | Louisville, KY | 877-494-7633 | www.zirmed.com

HIT Revenue: $61,000,000 (11) $51,000,000 (10) $44,000,000 (09)
Major Revenue: 100% Software

One hospital estimated

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Reference: 1. Ford D, Luttrell N. Leadership in patient safety: IV pump auto-programming. Presented at Cerner Health Conference; October 2009.

Hospira, Inc., 275 North Field Drive, Lake Forest, IL 60045 P12-3757-May., 12

74 '12 / 75 '11 — TeleTracking Technologies, Inc.* | Pittsburgh, PA | 412-391-7862 | www.teletracking.com

HIT Revenue: $60,469,500 (11) **$57,590,000 (10)** **$51,764,000 (09)**
Major Revenue: 80% Software; 20% Services
*Revenue estimate.

75 '12 / Not Ranked '11 — T-System, Inc. | Dallas, TX | 972-503-8899 | www.tsystem.com

HIT Revenue: $60,302,509 (11) **$58,585,431 (10)** **$56,163,638 (09)**
Major Revenue: 92% Software; 8% Services
M&A 2011: Clinical Coding Solutions; Practice Management Associates

76 '12 / 78 '11 — SPi Healthcare (formerly Springfield Service Corp.) | Tinley Park, IL | 708-342-6900 | www.spihealthcare.com

HIT Revenue: $57,693,000 (11) **$53,338,000 (10)** **$45,356,000 (09)**
Major Revenue: 100% Services

77 '12 / Not Ranked '11 — Experian Healthcare | Maple Grove, MN | 763-416-1000 | www.experian.com/healthcare

HIT Revenue: $56,400,000 (11) **$47,124,731 (10)** **$40,961,667 (09)**
Major Revenue: 100% Software
M&A 2011: Medical Present Value, Inc., 7/11, $185,000,000

78 '12 / 86 '11 — Edifecs, Inc. | Bellevue, WA | 425-452-0630 | www.edifecs.com

HIT Revenue: $56,099,400 (11) **$38,212,388 (10)** **$19,019,749 (09)**
Major Revenue: 80% Software; 20% Services

79 '12 / 80 '11 — Mediware Information Systems, Inc. | Lenexa, KS | 913-307-1000 | www.mediware.com

HIT Revenue: $55,523,000 (11) **$47,616,000 (10)** **$40,700,000 (09)**
Major Revenue: 30% Software; 5% Hardware; 65% Services
M&A 2011: CareCentric, 4/11

80 '12 / 81 '11 — Source Medical Solutions, Inc. | Birmingham, AL | 205-972-1222 | www.sourcemed.net

HIT Revenue: $53,676,000 (11) **$44,622,000 (10)** **$44,836,000 (09)**
Major Revenue: 38% Software; 1% Hardware; 61% Services

81 '12 / 77 '11 — Navinet, Inc. | Boston, MA | 617-715-6000 | www.navinet.com

HIT Revenue: $51,900,000 (11) **$49,700,000 (10)** **$49,600,000 (09)**
Major Revenue: 90% Software; 10% Services

82 '12 / 83 '11 — The SSI Group, Inc. | Mobile, AL | 800-881-2739 | www.thessigroup.com

HIT Revenue: $51,000,000 (11) **$43,100,000 (10)** **$40,325,000 (09)**
Major Revenue: 100% Software

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83 '12 / 88 '11

MEDSEEK | Birmingham, AL | 888-MED-SEEK | www.medseek.com

HIT Revenue: $50,248,995 (11) **$34,604,396 (10)** **$28,538,820 (09)**
Major Revenue: 60% Software; 40% Services
M&A 2011: Third Wave Research, Ltd., 4/11

84 '12 / 89 '11

Beacon Partners, Inc. | Weymouth, MA | 781-982-8400 | www.beaconpartners.com

HIT Revenue: $44,981,950 (11) **$33,931,375 (10)** **$24,660,423 (09)**
Major Revenue: 100% Services
M&A 2011: Healthcare Innovative Solution, 7/11

85 '12 / 91 '11

Agilex Technologies, Inc. | Chantilly, VA | 703-889-3800 | www.Agilex.com

HIT Revenue: $42,800,000 (11) **$31,000,000 (10)** **$18,500,000 (09)**
Major Revenue: 10% Software; 90% Services

86 '12 / 94 '11

ADP AdvancedMD* | South Jordan, UT | 801-984-9500 | www.advancedmd.com

HIT Revenue: $42,000,000 (11) **$30,689,639 (10)** **$26,286,643 (09)**
M&A 2011: Phylogic
*Revenue estimate.

87 '12 / 93 '11

Navicure, Inc. | Duluth, GA | 770-342-0200 | www.navicure.com

HIT Revenue: $39,138,508 (11) **$30,694,755 (10)** **$26,083,120 (09)**
Major Revenue: 98% Software; 2% Services

88 '12 / 90 '11

Surgical Information Systems, LLC | Alpharetta, GA | 678-507-1739 | www.sisfirst.com

HIT Revenue: $39,000,000 (11) **$33,000,000 (10)** **$29,500,000 (09)**
Major Revenue: 32% Software; 68% Services

89 '12 / 97 '11

Craneware, Inc. | Atlanta, GA | 404-364-2032 | www.craneware.com

HIT Revenue: $38,123,551 (11) **$28,397,115 (10)** **$22,992,682 (09)**
Major Revenue: 88% Software; 12% Services
M&A 2011: ClaimTrust

90 '12 / 95 '11

Edaptive Systems LLC | Owings Mills, MD | 410-327-3366 | www.edaptivesys.com

HIT Revenue: $37,800,000 (11) **$30,000,000 (10)** **$6,495,000 (09)**
Major Revenue: 20% Software; 80% Services

91 '12 / 87 '11

Capario | Santa Ana, CA | 888-894-7888 | www.capario.com

HIT Revenue: $36,400,000 (11) **$35,300,000 (10)** **$35,300,000 (09)**
Major Revenue: 100% Services

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92 '12 / 96 '11

Iatric Systems, Inc. | Boxford, MA | 978-805-4100 | www.iatric.com

HIT Revenue: $35,100,000 (11) **$29,000,000 (10)** **$27,700,000 (09)**
Major Revenue: 100% Software

93 '12 / Not Ranked '11

HealthcareSource | Woburn, MA | 800-869-5200 | www.healthcaresource.com

HIT Revenue: $29,000,000 (11) **$20,500,000 (10)** **$15,500,000 (09)**
Major Revenue: 95% Software; 5% Services

94 '12 / Not Ranked '11

Impact Advisors LLC | Naperville, IL | 800-680-7570 | www.impact-advisors.com

HIT Revenue: $27,872,291 (11) **$18,548,197 (10)** **$9,751,067 (09)**
Major Revenue: 100% Services

95 '12 / Not Ranked '11

Cumberland Consulting Group, LLC | Franklin, TN | 615-373-4470 | www.cumberlandcg.com

HIT Revenue: $27,785,000 (11) **$18,107,500 (10)** **$8,993,000 (09)**
Major Revenue: 100% Services

96 '12 / Not Ranked '11

DPSciences Corp. | Cincinnati, OH | 513-791-7100 | www.dpsciences.com

HIT Revenue: $26,000,000 (11) **$21,700,000 (10)** **$18,600,000 (09)**
Major Revenue: 30% Software; 60% Hardware; 10% Services

97 '12 / Not Ranked '11

GeBBS Technology Solutions | Towson, MD | 410-598-6011 | www.gebbssolutions.com

HIT Revenue: $25,700,040 (11) **$20,354,046 (10)** **$17,854,426 (09)**

98 '12 / Not Ranked '11

Arcadia Solutions, LLC | Burlington, MA | 781-202-3600 | www.arcadiasolutions.com

HIT Revenue: $24,841,114 (11) **$17,402,355 (10)** **$13,706,705 (09)**
Major Revenue: 100% Services

99 '12 / Not Ranked '11

SCI Solutions, Inc. | Los Gatos, CA | 408-378-0262 | www.scisolutions.com

HIT Revenue: $24,800,000 (11) **$23,000,000 (10)** **$19,000,000 (09)**
Major Revenue: 89% Software; 11% Services

100 '12 / Not Ranked '11

Health Data Specialists, LLC | Pomona, KS | 205-979-9545 | www.hds-llc.com

HIT Revenue: $22,183,000 (11) **$15,350,000 (10)** **$11,028,000 (09)**
Major Revenue: 100% Services

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Healthcare IT M&A 2011

A QUIETER YEAR THAN WE WOULD HAVE EXPECTED BY BEN ROOKS

In 2011 the industry actually saw fewer transformational deals than we would have expected, given the attention paid to the sector of late. In fact, the three largest deals we saw weren't one company buying another, but rather private equity firms buying their way into HCIT, suggesting, perhaps, that the market is more attractive to those outside it seeking to enter than to those who are already within and seeking to grow larger. Clearly, this wasn't the rule, but it was definitely a trend.

Ben Rooks

The sector's largest deal was Emdeon (#14), Nashville, Tenn., leaving the public markets only a few years after its initial public offering in a take-private transaction, in which it was acquired by noted private equity (PE) investor Blackstone Group, for more than $3 billion [12 times trailing earnings before interest, taxes, depreciation and amortization (EBITDA)]. Even under new ownership (though not new management), Emdeon continued to be acquisitive, purchasing EquiClaim for about $40 million and TC3 last spring. Next largest was St. Paul, Minn.-based Lawson Software's (#29) acquisition by PE firm Golden Gate Capital for $1.7 billion (14.6 times trailing EBITDA).

BOLT-ON ACQUISITIONS

A number of vendors in the top quarter of the HCI 100 made some interesting tuck-in acquisitions, notably Alpharetta, Ga.-based McKesson's (#1) purchase of reimbursement-focused Portico Systems and UK hospital software vendor System C. While not software-focused, CareFusion (#3), San Diego, Calif., acquired pharmacy automation vendor Rowa for $150 million. Continuing to acquire tuck-ins for product rather than sizable companies to drive inorganic growth, Cerner (#5), Kansas City, Mo., bought both ClairVia, provider of acuity-based staffing analytics, and long-term care software vendor, Resource Systems, neither of which cost more than $40 million. Siemens (#7), Malvern, Pa., acquired health information exchange (HIE) vendor MobileMD. CSC (#10), Falls Church, Va., continued to add to its healthcare portfolio (its acquisition of iSoft was discussed in last year's review), but it moved a bit further afield towards life sciences by acquiring Image Solutions.

Optum (#13), Eden Prairie, Minn., the IT subsidiary of United Healthcare (and purchaser of Picis, CareMedic, A-Life Medical and other notable names we've seen on the list in days gone by) took a slight breather from its torrid acquisition pace and made only one acquisition—consumer engagement vendor Connextions (no doubt disappointing a great many sellers and their bankers who'd hoped to line them up a whale buyer). Claims system vendor TriZetto Group (#17), Denver, Colo., purchased Gateway EDI to narrow the gap between physicians and the payers. T-System (#75), Dallas, looking to diversify away from its well-known T-Sheets (a paper data capture solution for the ED) and its electronic version, EV, made some moves towards revenue cycle management, albeit still in the ED, acquiring charge capture and coding software provider Clinical Coding Solutions, as well as ED billing vendor, Practice Management Associates.

Despite the oft repeated belief that transcription would die, Nuance (#20), Burlington, Mass., bought Atlanta, Ga.-based Webmedx (#82 in 2011) and Medquist (#22), Franklin, Tenn., purchased M*Modal for $130 million, actually taking its name as well as its business.

Moving down the HCI 100 List, we see a fair amount of activity with Mediware (#79), Lenexa, Kans., purchasing homecare vendor CareCentric; Merge (#35), Chicago, Ill., purchasing Ophthalmic Imaging Systems for around $30 million and Craneware (#89), Atlanta, acquiring ClaimTrust for $15-20 million, depending on if its targets are met. On the physician side, athenahealth (#31), Watertown, Mass., purchased referral management company Proxsys for about $36 million; Greenway Medical (#61), Carrollton, Ga., moved into the community health center market with its purchase of CySolutions; and Horsham, Pa.-based NextGen (#28), continued its movement away from just physicians towards the hospital with its purchase of surgery software vendor, CQI Solutions.

The HCI 100 list lost a few entrants this year as Vital Images (#74 in 2011), Minnetonka, Minn., was acquired by its major distributor, Toshiba, for $273

million and Medical Present Value (#98 in 2011), Austin, Texas, was bought by credit bureau Experian for $185 million (more than 20 times trailing EBITDA). Also leaving the list was Vitalize Consulting (#68 last year), Kennett Square, Pa., to SAIC.

MANY HIGH VALUE COMPANIES SOUGHT EXITS IN 2011, ONLY TO CLOSE DOWN THEIR SALES PROCESSES WHEN BIDDERS WEREN'T WILLING TO ACCOMMODATE THEIR HOPES AND DREAMS. INSTEAD, EXECUTION, DELIVERING HIGH-QUALITY PRODUCTS TO CUSTOMERS AND PATIENTS REMAIN THE RULE OF THE DAY. —*BEN ROOKS*

A FAMILIAR RING

Two final transactions remind us that those who forget history are doomed to repeat it. First, we saw Sage divest its physician office software business to Vista Equity Partners for $320 million and rename it Vitera (#36), Tampa Bay, Fla. This is in contrast to the $565 million that Sage paid when it acquired Medical Manager in 2006. Interestingly, Vista also owns Sunquest (#40), Tucson, Ariz., sold to it at a loss by Misys, as well as an interest in Surgical Information Systems (#88), Alpharetta, Ga., which it recapped at a profit in late 2010. Next, adding to the income of corporate name consultants, if not value to providers of care, Redmond, Wash.-based Microsoft (#24 in 2011) and GE Healthcare (#23), Chalfont, St. Giles, UK, announced their 50-50 joint venture, Caradigm. Which high purchase price assets from earlier HCI 100 lists will be placed there remains to be seen, but as a long time HCIT watcher, I'm afraid I cannot be too optimistic on the likely outcome.

As mentioned, I would have expected more high profile transactions this past year than we actually saw, given the high expectations and valuations, but perhaps that is exactly why they did not occur. Many high value companies sought exits in 2011, only to close down their sales processes when bidders weren't willing to accommodate their hopes and dreams. Instead, execution, delivering high-quality products to customers and patients remain the rule of the day. ◆

Ben Rooks (ben@st-advisors.com) spent 15 years on Wall Street as both an equity research analyst and investment banker focusing on HCIT. He is the founder of ST Advisors, an HCIT-focused advisory firm serving both companies and their investors and serves on the editorial board of *Healthcare Informatics*. ST Advisors is proud of its past work with both Clairvia and Mediware; however, as of this writing, is not actively engaged with any company listed above. ST Advisors and *Healthcare Informatics* appreciate the supplemental M&A data provided by Leerink Swann.

Great Timing for a Smart Company

AS ANALYTICS BECOMES ALL-IMPORTANT, A HIGHLY CAPABLE DATA ANALYTICS FIRM IS WELL-POSITIONED FOR THE FUTURE BY MARK HAGLAND

At a time when analytics capability will be critical for patient care organizations in everything their leaders attempt—meeting meaningful use requirements under the HITECH program, satisfying a dizzying array of mandates under healthcare reform-driven programs, stepping up to participate in rigorous new voluntary programs for accountable care, bundled payments, and the patient-centered medical home—could any IT vendors be better-positioned than those specializing in analytics and business intelligence? Hardly.

So it's not surprising that the folks at MedeAnalytics are seeing their Emeryville, Calif.-based company riding high these days. In fact, when MedeAnalytics, first founded as an EDI claims processing firm back in 1993, first began to make real industry waves about a decade ago, it was as a back-office revenue cycle management solution provider. But over time, the firm's executives had the prescience to expand their mission and capabilities to help hospital and medical group leaders not only engage in analytics around financial data, but also around clinical data.

As a result, MedeAnalytics has been growing rapidly in the past couple of years, and its senior executives see a strong growth trajectory going forward. The company is privately held, so it doesn't report financials; however, *Healthcare Informatics* estimates the firm's 2011 U.S. revenues at approximately $70 million, representing strong recent earnings growth. In terms of customers, MedeAnalytics now has more than 850 customers, including both payers and providers, and stretching across the U.S. and in the UK, Ken Perez, senior vice president of marketing, reports.

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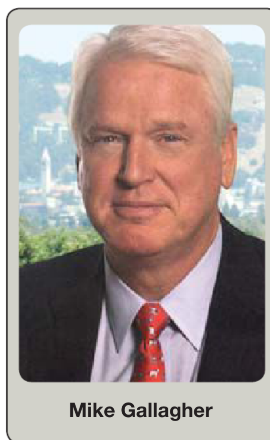
But it's the larger vision of where things are going that has MedeAnalytics' senior executives so excited about the future. "I think what will transform healthcare over the next decade is analytics; and we live to fulfill that mission," says Mike Gallagher, the company's chairman and CEO. "Our gig, so to speak, is the aggregation of disparate data sets, putting them in a hosted model, and delivering them through the web to healthcare executives in a HIPAA-compliant manner. Dr. Fautz, our chief medical officer and a co-founder, calls it 'data democracy,'" Gallagher adds. "And we work with both providers and payers."


Mike Gallagher

BRIDGING HEALTHCARE SECTORS

Importantly, the fact that MedeAnalytics bridges the payer and provider sectors in healthcare could well be its strongest calling card, as new reimbursement and care management models such as accountable care organizations, bundled payments, and patient-centered medical homes, emerge under healthcare reform and payer and purchaser initiatives.

Just ask Juan Davila, vice president of provider network management at the San Francisco-based Blue Shield of San Francisco. Over the past few years, Davila has been spearheading private-sector accountable care contracts with several different collaboratives of hospitals and medical groups in Northern, Central, and Southern California (with six live so far), with such well-known provider organizations as Hill Physicians Group, Dignity Health (formerly Catholic Healthcare West), California Pacific Medical Center, and Brown and Toland Medical Group.

"They're very customer-centric," Davila says of the MedeAnalytics folks. "I got everything I was thinking about." What Davila is referring to is his request that MedeAnalytics

build his organization a customized, from-scratch, data analytics system for a process to lower the percentage of denied provider claims. That tool has proven to be a wild success, lowering what had been an average 30-percent claims denial rate to a rate under 15 percent, and dramatically improving trust between Blue Shield and the providers in its network.

Ken Perez

Meanwhile, on the provider side, Dominic Segalla has equal praise to lavish on MedeAnalytics as a vendor partner. Segalla, senior vice president of Newark Beth Israel Hospital in Newark, N.J. (part of the Barnabas Health system, also Newark-based), has actually been working with MedeAnalytics as a CFO for nearly five years; he began as a customer when he was at St. Vincent's Hospital in Manhattan, and brought MedeAnalytics with him as a vendor partner when he came to Newark Beth Israel a year ago. Using the company's Patient Access Intelligence solution, its patient registration software, has helped his organization to significantly improve point-of-registration payer authorization verification, Segalla notes. And he and his colleagues have just started using MedeAnalytics' revenue cycle solution as well.

I THINK WHAT WILL TRANSFORM HEALTHCARE OVER THE NEXT DECADE IS ANALYTICS; AND WE LIVE TO FULFILL THAT MISSION. —*MIKE GALLAGHER*

In the end, part of MedeAnalytics' success has come about partly because of its executives' ability to anticipate change. "You can call us prescient, or you can call us lucky," Gallagher says with a chuckle. "It's hard work, and planning meets opportunity, and you can call that luck." He sees two very bright beacons going forward. First, is the fact that the company is already benefiting from having moved to a software-as-a-service (SaaS), hosted model, based on the fact that, as he puts it, "We felt that the license-and-install model was not sustainable over the long haul, but rather that the hosted model, the software-as-a-service model, was superior." Second, of course, is having strongly niched the company as a data analytics firm. As healthcare moves forward into a new, more collaborative era, with new reimbursement and organizational models, it's a fairly safe bet that smart companies like this one will do well going forward. ◆

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HAVING CORNERED THE PUBLIC HIE MARKET, ORION HEALTH IS NOW IN THE MIDST OF TACKLING THE PRIVATE SPACE BY JENNIFER PRESTIGIACOMO

Not only has Orion Health cornered the public health information exchange (HIE) market in the U.S. and abroad, the healthcare integration and HIE software provider is now making inroads into the private HIE market. Since breaking into the healthcare IT space 18 years ago, the company has built many capabilities on top of its integration product to meet the ever-changing needs of today's healthcare organizations in the throes of meaningful use.

After conquering its homeland of New Zealand, Orion went on to break into the other commonwealth countries of Australia and England. After having a difficult time getting the attention of larger provider organizations, Orion approached and won over rural locales, building an initial customer base and gaining some stateside credibility with its Rhapsody integration engine product, which connected disparate systems and supported a range of communication protocols and messaging formats.

Paul Viskovich

"There's an ongoing need to embrace and support the evolving standards that are developed and commit and lead in this area to ensure that you can connect most effectively to the participants and the exchanges," says Paul Viskovich, president of Santa Monica, Calif.-based Orion Health North America.

THERE'S AN ONGOING NEED TO EMBRACE AND SUPPORT THE EVOLVING STANDARDS THAT ARE DEVELOPED AND COMMIT AND LEAD IN THIS AREA TO ENSURE THAT YOU CAN CONNECT MOST EFFECTIVELY TO THE PARTICIPANTS AND THE EXCHANGES. —*PAUL VISKOVICH*

DISEASE SURVEILLANCE IN TEXAS

Orion's big American hit came when it supported messaging standards for the Centers for Disease Control (CDC) National Electronic Disease Surveillance System (NEDSS), an initiative that facilitated the development of registry-based, public health surveillance systems to identify and track emerging infectious diseases. Rhapsody is the platform for NEDSS, which relies heavily on LOINC, SNOMED, and HL7 standards, and upon which modules can be built to meet state data needs.

The Texas Department of State Health Services implemented NEDSS in May 2004, and went into statewide operation in January 2005. When the swine flu outbreak occurred in 2009, NEDSS was able to track those who were infected.

"Along came H1N1, and because we had a standards-based disease surveillance system, we could rapidly customize that data capture mechanism to adjust to the peculiarities of that condition as it was emerging," says Doug Hamaker, NEDSS coordinator, Texas Department of State Health Services. "Some of that preliminary work-up that we needed to do to capture was immediately shareable to all other states that were also NEDSS users."

Orion supports 49 state health departments, including Alaska, Massachusetts, New York, and California. Internationally, Orion supports seven out of 10 provinces in Canada, and entire countries like Singapore and Australia. With all this success, Orion was able to tackle private U.S. HIEs like Geisinger Health System,

UCLA Medical Center, St. Vincent's HealthCare, and Catholic Healthcare.

LAYERING SERVICES ATOP STANDARDS

Orion's strategy has been to layer essential provider services atop its Rhapsody integration engine, says Chris Hobson, M.D., chief medical officer, Orion. In 1999 Orion took its engine to the next level by offering providers a configurable portal view for access to patient information from myriad subsystems. Two years later, a medication reconciliation and an integrated chronic disease case management module were added. The Orion product has continued to evolve in the past five years to include a patient portal and Orion just signed a deal to support a patient portal for all Australians.

Chris Hobson, M.D.

Hobson says the one area he's excited about moving forward with is the care of the elderly. "We see the needs for standardized care of the elderly as being one of the next big things just because the population involved coming through," he adds. "There's going to be a need for more systematic evidence-based care of that population." He says that Orion has started a geriatrics project with Ontario to provide evidence-based assessments, based on U.S. data, to create a care plan if the patient has mental or mobility issues.

Hobson says Orion has also helped build patient-centered medical homes and accountable care organizations, mentioning clients like the Beacon Community of the Inland Northwest, which is focusing on diabetes care in central and eastern Washington and northern Idaho.

> **AS A SOFTWARE [COMPANY], WE SEE SUSTAINABILITY IN THE ABILITY TO PROVIDE MORE VALUE OVER AND ABOVE JUST CONNECTING STUFF, AND WE SEE THE ANSWER IN TERMS OF PROVIDING MORE CAPABILITIES. WE'RE INTERESTING [BECAUSE WE] FOCUS ON FLEXIBILITY AND INTEGRATION. —*CHRIS HOBSON, M.D.***

"As a software [company], we see sustainability in the ability to provide more value over and above just connecting stuff, and we see the answer in terms of providing more capabilities," adds Hobson. "We're interesting [because we] focus on flexibility and integration, which has enabled us to keep up with the tsunami of new requirements that keep coming at us." ◆

A Leader in the Ambulatory Market

A FLEXIBLE APPROACH AND A LONG-TERM PARTNERSHIP WITH ITS CUSTOMERS ARE THE FOUNDATION OF THIS VENDOR'S STRATEGY

BY JOHN DEGASPARI

Greenway Medical Technologies Inc. has built a solid reputation based on identifying a market niche and serving its customers well. From day one, its focus has been trained squarely on the ambulatory market, with a broad range of solution sets and services.

"We offer a lot of products and services, but ultimately, customers understand that when they come on board with us, that as things change, we too are going to change our product mix and services to get them ready for what's next in healthcare," says Greg Schulenberg, chief operating officer of the Carrolton, Ga.-based software provider.

Greg Schulenberg

Greenway's product and service offerings cover plenty of bases. PrimeSuite, the company's flagship offering, comprises an integrated EHR and practice management solution, but the company's expanding portfolio also includes solutions for data exchange, revenue cycle management, mobile computing, patient portal, clinical research, imaging, and dictation.

Moreover, part of the company's philosophy has been to serve up its solution sets in any form that the customer prefers. Late last year the company added a cloud platform to its offering, with applications around analytics, care coordination, and quality. "We want the customer to have the toolset, and we will offer it in any medium that exists," Schulenberg says.

KEEPING PACE WITH GROWTH

The company's philosophy has paid off, with 30-percent year-over-year growth, according to Schulenberg. Asked whether he has concerns about the company's ability to maintain its loyal customer base, he says that the company's solution set, services, and interoperability will continue to evolve and keep pace with the company's growth. "We believe wholeheartedly that our solution set has to continue to evolve, our services have to continue to evolve, and our interoperability has to continue to evolve. If anything, we have to be better tomorrow than we are today, because we do have more customers and they are coming to us at a faster clip," he says.

Schulenberg believes the ambulatory physician stands at the genesis of healthcare. "The physician sees the patient, refers the patient to the hospital, and does follow-up care with the patient. So the ambulatory physician is at the epicenter of healthcare, and every initiative out there is focused on the ambulatory physician," he says.

He sees Greenway's responsibility as going beyond supporting its customers every day, to helping them keep up with long-term healthcare trends, including accountable care and patient-centered medical homes. "At Greenway we look at this as a very natural movement," he says. "We have customers that are forming patient-centered medical homes and accountable care organizations using Greenway services and software, and working toward certifications on many levels."

A VIEW FROM THE TRENCHES

Alpine Urology PC, a four-physician practice in Colorado, installed Greenway PrimeSUITE in July 2010 to replace an electronic medical record package from another company. Part of the reason for choosing PrimeSUITE was the comprehensiveness of the offering, according to Bill Carlton, Alpine's practice administrator.

Alpine uses Greenway software to update lab results to the physicians. "When we pull it up, it's like an inbox, separated by physician. The lab results that are outside the normal range appear in red,

(Continued on p. 64)

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Up and Comers

PROFILES OF FIVE EMERGING HEALTHCARE IT VENDORS WORTH KEEPING AN EYE ON BY DAVID RATHS

It's always interesting to see new companies pop up on the HCI 100 list, but it's even more fun to speculate about which companies will make the list two or three years from now. *Healthcare Informatics* interviewed the CEOs of five promising companies to keep an eye on.

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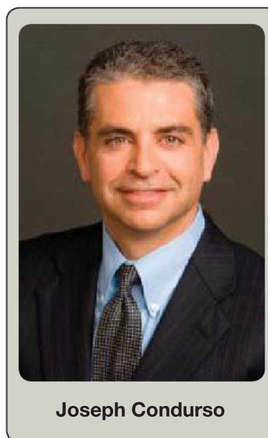
San Diego, Calif.
www.patientsafesolutions.com

Companies that offer the most elegant, streamlined solutions involving mobile devices and care coordination are bound to be in high demand in the coming years. One to keep an eye on is San Diego-based PatientSafe Solutions, which has built a mobile care "orchestration" system around a ruggedized Apple iPod.

The company, which started a decade ago as Intellidot, and focused on handheld bar-coding systems, changed its name in 2009 to PatientSafe, and with a $30 million infusion from investors re-launched in January 2011 with the new focus. (The company was named one of the *Wall Street Journal's* Top 50 Venture-Backed Companies in 2011.)


Joseph Condurso

President and CEO Joseph Condurso joined the company in 2011 after more than 25 years in health IT, including stints at Motorola Inc. and CareFusion Corp. "What attracted me to PatientSafe was the disruptive opportunity to create a mobile healthcare IT platform that truly is patient-centered," he says. "It can put the technology in the hands of clinicians and provide real-time clinical decision support." He was also intrigued by the possibility to leverage Apple's elegant consumer user experience in the clinical IT space.

The company's PatientTouch system and electronic mobile medical appliance (eMMA) can work with any core EHR system and send data bi-directionally. The iPod solution is engineered and ruggedized for hospital use and features a scanner to read barcodes for patient association and verification. Communications are via a hospital's secure wireless network.

"We think we are working on a brand new category called mobile care orchestration," Corduso says, that includes workflow, clinical decision support, care coordination, and communication. "We can help create a social network inside the firewall, so nurses aren't hunting for data. The whole care team sees all the information surrounding a particular patient concurrently."

Among other things, PatientTouch allows users to access real-time information, view and manage a care plan, handle patient assignments and manage alerts and notifications.

The 100-employee company has 70 healthcare facilities lined up as customers, 63 of which are up and running now. It sells directly to hospital organizations, targeting chief nursing executives and quality and patient safety officials. As meaningful use and accountable care models emerge, PatientSafe will continue to fine-tune its technology that supports caregiver communication and real-time access to clinical data, Corduso says.

WHAT ATTRACTED ME TO PATIENTSAFE WAS THE DISRUPTIVE OPPORTUNITY TO CREATE A MOBILE HEALTHCARE IT PLATFORM THAT TRULY IS PATIENT-CENTERED. IT CAN PUT THE TECHNOLOGY IN THE HANDS OF CLINICIANS AND PROVIDE REAL-TIME CLINICAL DECISION SUPPORT. —*JOSEPH CONDURSO*

"The next step is to follow the patient outside the walls of the hospital and in transitions of care for things like, 'medication management,' he

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says. The patient has to be at the center of care."

Humedica
Boston, Mass.
www.humedica.com

Healthcare organizations of all stripes are moving beyond business intelligence based on claims data. They are starting to access and mine the clinical data necessary for performance improvement. One company that may have found the sweet spot of clinical informatics platform innovation is Humedica. Founded in 2008, the Boston-based company has grown to 80 employees and expects to reach 125 by the end of the year.

Humedica's software-as-a-service analytics platform assembles, standardizes, and analyzes EHR data as well as operational and financial data. "We felt the time was right for the disruption needed to get the clinical data that organizations need," says Michael Weintraub, Humedica's president and CEO. "The plumbing and piping of EHRs is now getting into place. But their DNA is transactional, not analytics. Accountable care organizations, population health organizations and multispecialty groups all have to get their arms around their manufacturing processes and take a longitudinal view, and it has to be data-driven."

Some of Humedica's growth is based on its partnership with Anceta, a subsidiary of the American Medical Group Association that facilitates shared learning around Humedica's comparative data. Multispecialty groups are looking across disease and therapeutic areas to understand their data and get better together, Weintraub says. "We now have two dozen organizations involved. Anceta is the trusted intermediary and we are the informatics platform."

So as large medical groups join Anceta, they automatically begin using Humedica tools. For instance, 150-physician Holston Medical Group in Kingsport, Tenn., recently announced it would work with Anceta and Humedica's MinedShare clinical intelligence solution.

Another milestone in 2011 was a partnership formed with Allscripts, which is now both an investor in the company and a sales channel, Weintraub says. "They have a large footprint and saw the opportunity to be a horizontal solution provider in the clinical informatics space," he adds.

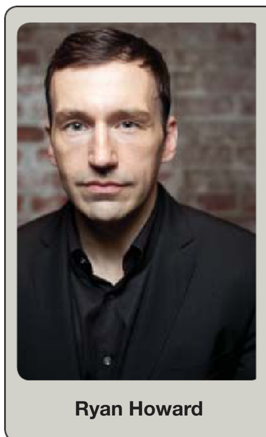
Humedica now works with provider organizations in 30 states that are responsible for more than 20 million patients, Weintraub says, adding: "We are investing in scaling up to take the company to the next level."

WE FELT THE TIME WAS RIGHT FOR THE DISRUPTION NEEDED TO GET THE CLINICAL DATA THAT ORGANIZATIONS NEED. —*MICHAEL WEINTRAUB*

Practice Fusion
San Francisco, Calif.
www.practicefusion.com

When web-based electronic health record vendor Practice Fusion launched in 2006, the company expected to charge physician offices around $300 per month. "We had the idea of being the Salesforce.com of healthcare," notes Ryan Howard, the company's CEO and chairman. But Howard's team soon switched gears when potential customers balked at paying even that much.

Practice Fusion changed to a free service that is supported by advertising and hasn't looked back since. "Because we were small we had the agility to change quickly based on physician feedback," Howard says.


Ryan Howard

In order to be attractive to advertisers, Practice Fusion had to have a strong user base, so it battled a chicken and egg problem the first few years. But with more than $40 million in venture funding and other investments, it has grown to 150,000 users today. "Price point is the most obvious way we are disruptive," Howard says. One of his greatest challenges, he says, is just managing the San Francisco-based company's growth. It now has 150 employees and is adding eight to 10 per month.

"My job is to maintain the culture," Howard says. "We love our users and they love us. Look at our Facebook page and look at Allscripts' Facebook page, and I think you'll see quite a contrast."

Howard notes that the timing of the federal government's EHR incentive program has helped immensely. "I think we came out at exactly the perfect time because it takes three or four years to build out the product," he says, "and meaningful use comes along and is basically a $20 billion marketing campaign. It is a massive catalyst for our business."

Montage Healthcare Solutions
Philadelphia, Pa.
www.montagehealthcare.com

Clinicians often make good entrepreneurs because they can clearly see a product niche that needs filling. That's the case with Montage Healthcare Solutions, which was founded by a group of radiologists and imaging informatics experts. Their radiology

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Orion Health, a global leader in eHealth, develops solutions used by providers and technology partners in 30 countries worldwide.

Orion Health's health information exchange (HIE) and integration solutions connect communities by improving the sharing of healthcare data between and within healthcare organizations and business partners. Our easy-to-use products quickly deliver comprehensive information, efficiently and securely, so patients can receive the quality care they deserve.

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Go to www.orionhealth.com/HI or email inquiries@orionhealth.com.

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search engine grew out of their own daily work in the Department of Radiology in the Hospital of the University of Pennsylvania (HUP) in Philadelphia. Montage enables radiologists and researchers to search their own radiology information system and EHRs for specific diagnoses.

"We had a lot of data but had trouble getting access to that data," explains William Boonn, M.D., Montage's president. They could ask a database analyst to help them craft something, but that might take a week and then the radiologists would have to go through iterations to refine those searches.

WE SAW OPPORTUNITIES FOR HOSPITALS TO SEARCH THEIR IMAGING SYSTEMS TO HELP WITH CLINICAL DATA SUPPORT, FOR PERFORMANCE MEASUREMENT AND EFFICIENCY AND FOR RESEARCH AT ACADEMIC MEDICAL CENTERS. —*WILLIAM BOONN, M.D.*

Woojin Kim, M.D.

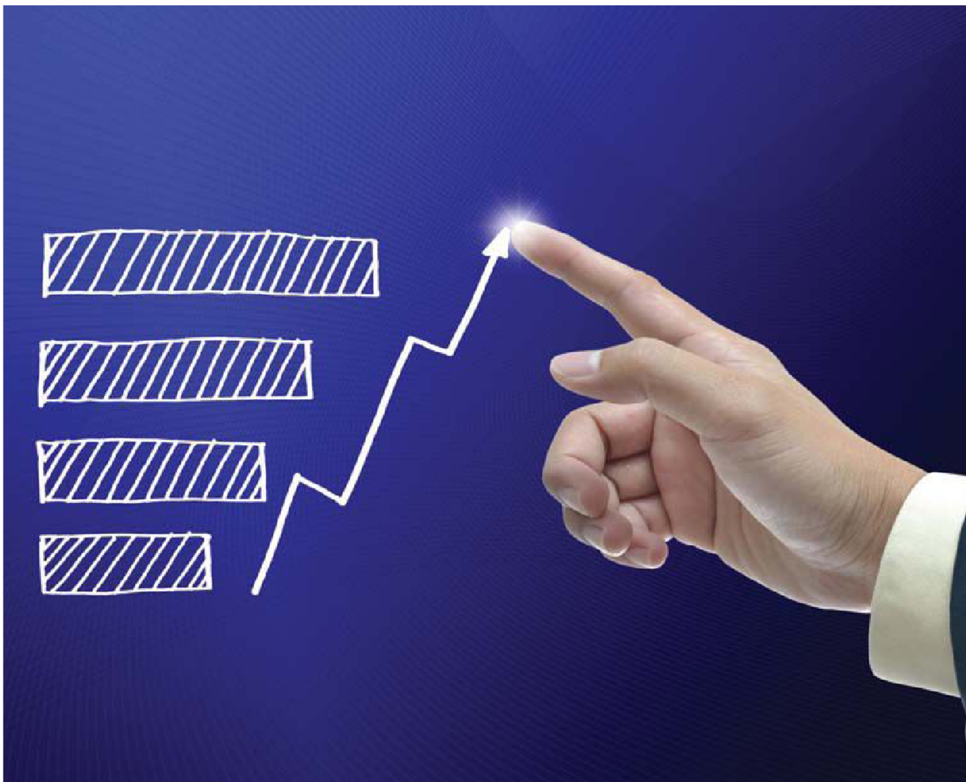
"With today's technology, we expect to find that information instantly just like searching with Google," Boonn says. "So we saw opportunities for hospitals to search their imaging systems to help with clinical data support, for performance measurement and efficiency and for research at academic medical centers."

Montage's founders had previously developed a product called Yottalook, a widely popular and free medical imaging search engine. The commercial product, Montage, combines Yottalook's external search capabilities with an enhanced capability to query both radiology and pathology information systems.

As Woojin Kim, M.D., another Montage executive and associate director of imaging informatics at HUP, told *Healthcare Informatics* in a January 2012 interview, a lot of hospitals are building their own data warehouses or buying one so that they can federate their databases and mine them. "This is a nice application that can sit on top of such a system," he adds, "where its easy-to-use interface allows for powerful searching capability across multiple different databases."

Launched in 2009, Montage now has a dozen hospital customers and expects to announce several more soon. Its users include radiologists, administrators, non-radiology physicians, and research coordinators.

One milestone that may boost sales is a reseller agreement with speech recognition reporting vendor Nuance Communications Inc. "They are a large company with a big reach, something like 1,500 customers," Boonn adds. "We are excited to be integrating with their flagship product. It gives the ability for radiologists doing dictation to access Montage. It's easier in some way to approach their installed customer base than to approach new customers."



There are currently lots of technological and policy disruptions in radiology, Boonn says. There is an enhanced focus industry-wide on quality, efficiency, and performance measurement. "The tools we provide can help practices through these rocky waters," he says. "If you can't measure, you can't improve. Without these tools, people trying to measure find it takes too long and they are flying by the seat of

their pants rather than really looking closely at their data to identify the issues they can address. This helps them quantify and focus."

DiagnosisOne

DiagnosisOne
Lowell, Mass.
www.diagnosisone.com

People tell Mansoor Khan that his company's timing was good. His response is "No, the world is finally catching up with us."

Khan, CEO and co-founder of clinical decision support vendor DiagnosisOne, is riding a wave of growth. The Lowell, Mass.-based company expects to almost double its headcount from 40 to the mid-70s by the end of this year and to double that number next year. It has 200,000 physicians using its decision support and analytics tools. Its smartConsult module integrates with electronic health records to deliver real-time, patient-specific alerts at the point of care.

"Our company grew out of an effort by our chief medical officer and others to write a textbook about diagnostic algorithms," Khan explains. "They created this huge collection of evidence-based knowledge. Having a software background, I saw that this needed to be in electronic format, so we took that baseline work and expanded it."

Mansoor Khan

What makes its platform unique, he says, is the container around that knowledge. "We made two key early decisions: First, we based it on HL7 Version 3 object model, which is where the industry is heading, so we have a head start there," he says. "Second, we keep the knowledge in one centralized database but have a highly distributed model and work with many EHR platforms."

DiagnosisOne offers a menu set, and providers can choose which tools they want to use, ranging from notifications about care gaps to order sets and public health reporting. Each physician gets the alerts and analytics they want. "As risk is shifting to providers, they need this information to boost efficiency and to support the decision-making process," Khan says.

DiagnosisOne may not grow to be a household name, in part because it doesn't sell directly to the end-users; its products are embedded directly in EHR vendor software. In 2011 it signed a deal with Allscripts, but also has arrangements with vendors such as Aprima and Greenway.

Meaningful use Stage 2 presents clinicians with a series of issues, Khan says, ranging from CPOE to clinical decision support rules to a variety of quality measure reports. "These are all knowledge management challenges that we can help clinicians address." ◆

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The Beginning of the Vendor Relationship

THE IMPORTANCE OF PICKING OUT THE RIGHT CLINICAL IS VENDOR AND HAMMERING OUT THE CONTRACT BY GABRIEL PERNA

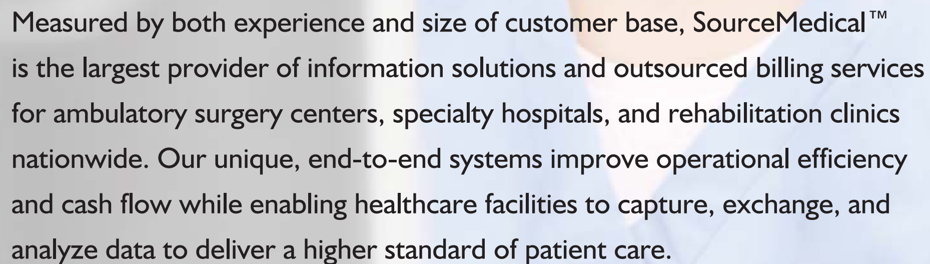
It would be dramatic to say a health IT vendor contract can make or break a provider organization, and that's far from the truth. Yet, according to many industry experts, in this day and age, when time is of the essence due to the regulatory pressures emerging from the American Recovery and Reinvestment Act/Health Information Technology for Economic and Clinical Health (ARRA/HITECH) Act, the transition to the ICD-10 coding set, and the Affordable Care Act (ACA), it's not a stretch to say that strategizing a vendor contract for a clinical information system (IS) is of the upmost importance.

Providers can rarely afford to make a mistake when choosing a vendor, especially for an EHR system. With meaningful use, a vendor's products must stay aligned with the requirements, says Fran Turisco, director of the Pittsburgh-based consulting firm Aspen Advisors. As the Massachusetts-based Turisco notes, the worst thing that can happen is to put a lot of time and money into an implementation that won't get an organization to where it wants to be.

It's not just about meaningful use, in her view. "I would look beyond that," Tursico says. "I'm working with a number of hospitals that are starting to get into accountable care, whether it's a CMS [Centers for Medicare & Medicaid Services] pilot or any program. They see it coming. They are building relationships with payers, community hospitals, long-term care facilities, and all of this…relies on technology. It's how you communicate. It's how you share data. That's how you get referrals to the tertiary care hospitals."

THE SEARCH

If the vendor relationship is not to be taken lightly, the lengthy process of choosing a vendor must be a procedure of logic, says Joe Marion, founder and principal of the Waukesha, Wis.-based Healthcare Integration Strategies. Marion says this is not what vendors want to hear, but for the provider, it makes sense. "It's important for facilities to zero in on strategic vendors that make sense," he says. "If I'm a McKesson



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hospital, it doesn't make sense to look at a Cerner solution. If I'm Siemens for imaging equipment, it doesn't make sense to be looking at GE for a PACS [picture archiving and communication system]."

Marion acknowledges that there are some exceptions, but says it's generally better to know which vendors make sense strategically before going about a search. Rick Ferguson, president and CEO, Oklahoma Surgical Hospital, a 76-bed facility in Tulsa, says his organization had trouble with this facet, before settling on a working solution. Because the hospital has numerous surgical specialties, it requires management from the surgical side plus patient accounting needs.

Oklahoma Surgical had trouble finding the right recipe, and went with MedGenix (Springfield, Mo.), which eventually merged with Prognosis (Houston, Texas). The first system from MedGenix was an integrated relational database, and it didn't fit the hospital's needs for a surgical management solution, according to Ferguson. It continued to use MedGenix for the patient accounting, while for the surgical management system, the organization chose Surgical Information Systems (Alpharetta, Ga.), and developed an integrated best-of-breed approach.

Joe Marion

Fran Turisco

Chuck Podesta

The decision to stay with MedGenix wasn't an issue, according to Ferguson. "With any information system, it's almost like a marriage; you have to make sure there's a fit there, and we felt culturally comfortable with them," he says. Once MedGenix and Prognosis merged, he says choosing an EHR became a lot easier for Oklahoma Surgical because of the culture and the fact it wouldn't have to maintain two separate databases.

Chuck Podesta, senior vice president and CIO at Fletcher Allen Health Care, a 550-bed tertiary care academic medical center in Burlington, Vt., says his organization wanted to get down to two vendors as quickly as possible during the selection process for its EHR vendor. Once it narrowed down the choice between Cerner (Kansas City) and Epic (Verona, Wis.), the entire organization was involved in making the final decision, he says. From an EHR perspective, he said clinicians, in particular, had a big say in selection. Through this process, which also involved a thorough cost-analysis, Fletcher Allen chose Epic.

FLEXIBILITY —OR NOT?

Once a company has been selected, the next step is working out a contract. Contract flexibility depends on both the vendor and the organization, Aspen's Tursico says. Prestigious organizations, such as a Johns Hopkins or a Mayo Clinic, have leverage, she says. Speaking from the perspective of the provider organization, Podesta notes that some contracts, like those offered by EHR vendors such as Epic and Meditech (Westwood, Mass.), are going to be ironclad, while others, such as McKesson and Cerner, tend to leave a little bit of wiggle room for providers.

Podesta says providers must not allow the need for contract flexibility to place a burden on the most important part of the process: the go-live. "Get it up and running so you can start to get the benefits of it and move into optimization phase, where you really get the benefits," he urges. "You don't want to fall on your face…The last thing you want to do is put together a four-year implementation plan because you are changing the system over and over again, and trying to get 100 percent out of the design of the system. That's a dangerous road to go down since you don't know how good this system is until it's in use."

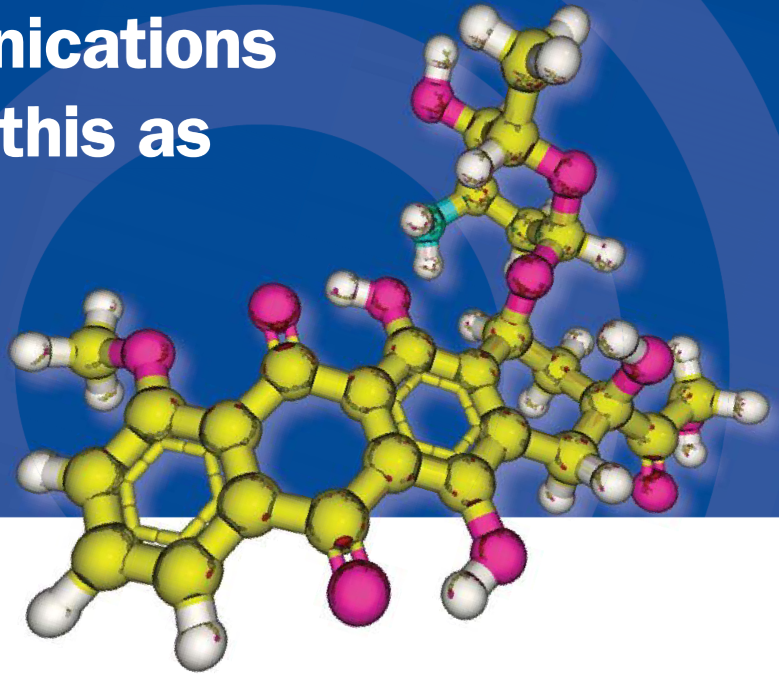
There is also the potential to be too aggressive, in the desire to go live as fast as possible, especially under the pressure of meaningful use deadlines, says Podesta. He says if an organization is just starting its EHR selection now, it's not worth it to hit any meaningful use deadline before 2015. The money it would get from incentives isn't worth risking the organization's profitability, he says.

Finding the middle ground that Podesta speaks of is something Turisco advises as well. "Before you sign on the dotted line, make sure the ball is in your court," she says. "Make sure all the important points are in the contract before you think about signing it. But the other thing is, is you can't drag it out. Once you get involved, the important thing is to make sure it is someone's business that all the bases are covered."

PARTNERSHIP IS THE GOAL

The relationship should not end at the contract signing, of course. Observers like Healthcare Integration Strategies' Marion say that developing a strategic connection within the organization is essential to quickly resolving issues as they occur. The worst thing that can happen, he says, is having a vendor that closes the deal, collects, and moves on. "Make sure that it's a two-way partnership," he says, and one designed to last for years, especially given the long horizons involved in achieving meaningful use and preparing for the future beyond meaningful use. ◆

Some communications providers see this as "some cells."



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2012 IT Innovation Advocate Award

HCI HONORS THE TOP THREE WINNERS, PLUS AN INTERVIEW WITH BRIAN PATTY, M.D., CMIO AND TEAM LEAD OF FIRST-PLACE HEALTHEAST CARE SYSTEM BY MARK HAGLAND

EXECUTIVE SUMMARY:

Quality is the focus of this year's three Healthcare Informatics/AMDIS IT Innovation Advocate Award winners. Brian Patty, M.D., CMIO and team lead of HealthEast Care System, which won top honors, explains the goals and challenges of his organization's initiative to leverage clinical IT to drive quality at his organization.

For the second year in a row, *Healthcare Informatics* and the Association of Medical Directors of Information Systems (AMDIS) are proud to sponsor the Healthcare Informatics/AMDIS IT Innovation Advocate Award program, which recognizes teams of clinical informaticists, clinicians, and other healthcare leaders in hospitals, medical groups, and health systems whose innovative initiatives are moving healthcare forward.

Brian Patty, M.D.

This year, our organizations are delighted to announce the first-, second-, and third-place winning teams here. The three teams are:

First Place: The health informatics team at the St. Paul, Minn.-based HealthEast Care System, led by HealthEast CMIO Brian Patty, M.D., for that team's broad leveraging of clinical IT in the pursuit of the organization's quality improvement goals.

Second Place: The short-cycle measure dashboard team at Cleveland Clinic (Cleveland, Ohio), led by Andrew W. Proctor, senior director, business intelligence, for that team's work on a real-time quality dashboard mechanism and process.

Third Place: Edward Rippel, M.D., of Quinnipiac Internal Medicine, a solo internal medicine practice in Hamden, Conn., which was the first solo medical practice in the state of Connecticut to receive formal patient-centered medical home recognition by the National Committee on Quality Assurance (NCQA).

We at *Healthcare Informatics* recognized representatives of all three top teams with awards at the Healthcare Informatics Executive Summit in Orlando in May, and will share interviews with the team leads from each of those teams in the coming months.

In that regard, the first interview to be presented is with Brian Patty, M.D., who leads the health informatics team at HealthEast, a 684-bed, four-hospital integrated health system. At HealthEast, Brian Patty leads a team of about 45 informaticists, 90 percent of them clinician informaticists, who have been involved in an impressive array of initiatives across the organization.

Among the team's accomplishments have been:

• Facilitation of several comprehensive implementations, including a full-replacement computerized physician order entry (CPOE) system, broadly interoperable clinical documentation system, bedside barcoded medication administration system (eMAR), pharmacy management system, and comprehensive physician portal.

• Development of an advanced clinical decision support (CDS) system that incorporates innovative web-based physician order sets called iForms.

• Advanced applications, including an enterprise-wide longitudinal health summary and an advanced provider notes application with capabilities expanded beyond the usual physical and discharge summary documentation capabilities.

• Implementation of a data ware-

house in an online analytical processing (OLAP) environment, to facilitate financial, operational, and quality retrospective analytics.

Patty, who reports to HealthEast's CEO and is a peer of the organization's CIO, works collaboratively with HealthEast's CIO, and credits the organization's culture of cooperation and innovation with the success of his health informatics team in making inroads in all these important areas. He spoke recently with *HCI* Editor-in-Chief Mark Hagland about all this; below are excerpts from that interview.

FOCUS ON DECISION SUPPORT

Healthcare Informatics: What are the top-line things you're accomplishing?

Brian Patty, M.D.: Our primary focus is to work closely with our quality department, and really find out what their priorities are. And we focus the decision support tools that we deploy based on what we feel will best help us focus our quality work. So where are the pain points in some of our quality initiatives, and what can we do with our EHR and with some of our CDS tools, to help out? Some areas that are naturally included are the management of falls and pressure ulcers, and so on; but we're really focusing on how we can help the organization.

HCI: What have you found to be the biggest process-oriented challenges in

St. Joseph's Hospital DePaul Tower. Photo: HealthEast Care System

The Vocabulary of Interoperability

An Interview with Dr. Hon Pak, former U.S. Army CIO

Healthcare Informatics recently sat down with Dr. Hon Pak, former CIO of the U.S. Army, to discuss health information exchanges (HIEs) and today's data landscape.

How long have you been working in the healthcare information technology industry?

Dr. Hon Pak: I have been in the industry for 15+ years. As a clinical dermatologist, I recognized the need to improve access to specialty care using health IT so I became involved early in telemedicine and later served as president of the American Telemedicine Association as well as on their board. I also conducted research and development around telemedicine and other healthcare information technologies, including grid technologies, decision support, natural language processing, semantic web, and others. In 2008, I became the first CMIO for the U.S. Army and the first physician CIO for the Army. I recently retired after 28 years of military service and became CEO of Diversinet.

During your time as the CMIO and then the CIO of the U.S. Army, what kind of a data landscape did you encounter?

I think most people are aware that the U.S. Department of Defense (DOD) is fully deployed in terms of electronic health records – that includes the Army, Air Force, Navy and Marines. Even before the EHR, the DOD had computerized provider order entry, called CHCS, and used the 3M Healthcare Data Dictionary (HDD) to normalize the data from CHCS and legacy information systems. DOD has close to 80-plus CHCS hosts that are normalized by the 3M HDD and stored in the clinical data repository (CDR). DoD has an inpatient system called Essentris that is not yet fully integrated and exists as separate local systems. Therefore the inpatient data is not normalized as part of the CDR and this represents a significant gap.

What are the challenges inherent in this system?

One challenge is that DoD now has a massive amount of data that needs to be managed and analyzed. While Air Force Medical Service has led the largest clinical data warehouse effort, DoD has the continuing challenge of collecting and integrating data from the TRICARE network. While we collect billing data, we do not have access to the clinical data. VLER/Health Information Exchange is designed to address this gap, but it will take some time. In addition, there are numerous disconnected sources of data, including but not limited to medical device data, data from HR and other readiness systems. It is taking a significant effort to bring together data from so many sources and they are just beginning to get their arms around its analysis. Providing meaningful analytics to deliver clinical decision support, predictive analytics and positive outcomes is essential. As the CIO of the U.S. Army, I participated in what is likely the most significant ongoing effort for DOD and VA: *The Integrated Electronic Health Record* initiative. The goal of this program is to create a seamless EHR for both DoD and VA, and the underlying imperative is to achieve semantic interoperability.

At DOD and in other healthcare organizations, what barriers to interoperability exist?

All healthcare organizations have the baggage of legacy systems. We're not at a point that everything in medicine has been standardized in terms of terminology. We have LOINC (Logical Observation Identifiers Names and Codes), SNOMED, and UMLS (Unified Medical Language System) to name a few standardized healthcare vocabularies and terminologies. Each vocabulary was established for a specific purpose and the idea that they should be mapped together wasn't a consideration at the time they were designed. Furthermore, there are many gaps in existing terminologies. We also have various parts of healthcare organizations that have defined terminologies differently for specific uses. How do you now take all the data that's been defined in different ways and map it to a standard terminology for multiple purposes, including billing, clinical analytics and decision support. I think the biggest challenge is taking what's available from a standard vocabulary and then trying to use it in practical everyday clinical care to analyze, predict and measure outcomes. This is where healthcare needs a tool like the 3M HDD to normalize and semantically map the various existing and legacy vocabularies.

How can a healthcare data dictionary improve interoperability?

Given the various terminologies and lack of a universal standard terminology that covers all types of healthcare data, the 3M HDD allows organizations to practically use existing standard terminologies along with legacy systems, which typically have a set of terminologies that must be mapped to stadard terminologies. It is a tool that alows us to manage the disparate terminologies in within health information systems, including EHRs, practice management systems, and so on. If widely adop ted, by HIEs for example, our collective ability to meaningfully leverage and analyze the growing amounts of exchanged data will be significantly advanced. Our understanding and the ability to share the knowledge gained from the 3M HDD would be reusable, which should lower costs for those that adopt HDD.

How can interoperability and standardized, normalized data improve patient safety?

There is no question that standardized data improves patient safety. It does this by ensuring that ambiguity and uncertainty is eliminated from the data—whether it's data noting an aspirin allergy or information about a specific

medication for a patient—using a standard terminology allows data to be understood by other providers and systems for continuity of care. For example, it makes it possible to do an allergy check when a physician provides a new prescription. This clearly demonstrates the potential impact on patient safety. In the past, when I communicated with another provider or staff member, it was done on paper or verbally and we lived with the potential and reality of human errors. Now all of a sudden we're doing it electronically. We have come to understand that we need a common language for healthcare to leverage the power of information systems to analyze drug interactions or enable more complicated clinical decision support. There is no longer a question if a standard terminology is needed, it is a matter of how best to manage it using available tools like the HDD.

What other benefits will we see resulting from the use of the HDD Access, the public version of the 3M HDD?

We'll see other benefits particularly around health information exchanges (HIEs) where having HDD-like capabilities will enable a huge advancement in data interoperability since patients are ambulatory and migratory, and the data exists in different places, from laboratory systems to PHRs and so forth. The challenge is in taking all the different data sources and making them meaningful. Normalization is one thing, but really a primary focus has to be what users are going to do with the data and how they are going to contextualize it before delivering it in an actionable way at the point of care. Ultimately, the benefit will be in how data is used, especially around decision support and analyzing data for population health and patient engagement.

What can HIEs and rural and smaller healthcare facilities expect if they employ an HDD?

The local community hospitals and smaller clinics really don't have the financial resources of their larger counterparts. I believe that by opening access to the HDD, and possibly delivering it in a software-as-a-service model on the cloud, it will lower the costs of mapping and maintenance over time as the amount of data exchanged increases. This will allow smaller practices to leverage its knowledge base, which was previously only available to large healthcare organizations.

What do you see as the future of health data exchange in the next 5 to 10 years?

Health information exchanges are attempting to create interoperability across different hospitals and regions for all the reasons we've talked about: patient safety, continuity of care, and so on. The future, as I see it, is a set of services developing around the HIE. Currently, they are simply passing limited sets of standardized data, including CCDs or C32 documents. In the near future, many more data elements will be exchanged and we'll be able to address the need for analytic, population health management, and clinical decision support services.

I believe HIEs are going to mature with sets of service to include mobilization of the HIE, referral management services, analytic services, and all the things that are currently hard to do and too costly for small practices. Over the next five to ten years, we will have those services available and delivered in a more economical way in the cloud.

How do you see HIEs developing?

I would use the analogy of our first highways. Imagine what happened when the first highways were formed. First, the highway, plumbing and infrastructure developed on the cross sections of rivers. At the cross sections of highways, cities formed and people aggregated. Most significant, a set of services developed to meet people's needs, and the cities grew along with the services.

In terms of healthcare data interoperability, we currently have rudimentary data exchanges occurring in HIEs. As they mature, I hope businesses will develop and deliver services and innovate around the HIE framework. At the end of the day, it's all about the data, so I believe that HIEs and the EHR will converge as software as a service and cloud computing advances. I predict that over time innovations will thrive around these HIEs, and technology like the HDD can be delivered, not just to the big guys that can afford it, but to all providers and small practices so that every patient can benefit.

HDD Access: Openly Available to All

3M, the U.S. Department of Defense (DoD) and the U.S. Department of Veterans Affairs (VA) jointly present HDD Access, the public version of the 3M Healthcare Data Dictionary (HDD). The 3M HDD is a controlled medical terminology server and knowledge base that has been continuously expanded and maintained for the past 16 years. It has been selected as the core technology to enable semantic interoperability for the DoD/VA integrated Electronic Health Record (iEHR).

HDD Access will help healthcare organizations accelerate implementation of electronic health records and achieve interoperability between disparate systems. HDD Access enables clinical data capture, queries and analytics, and organizes healthcare data to support requirements under meaningful use. It provides the foundation for enhancing healthcare analytics, decision support, and business intelligence.

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Registration and complete information for accessing the open software is available at the new HDD Access web site, www.HDDaccess.com. Join the HDD Access community – together, we can achieve the vision of using integrated, interoperable and measurable data to improve healthcare for all.

what you do to support care improvement?

Patty: I think it's in designing solutions that allow more efficient workflow for end-users, yet also let us meet our quality goals. For example, take our VTE [venous thromboembolism] prophylaxis order set: we had a lot of challenges in designing that set so that it would feed clinicians with some risk-based scenarios to help them select the right treatment, but also to allow them, if they chose not to use the recommended treatment, to use a reason that would be acceptable to CMS [the federal Centers for Medicare and Medicaid services], and not to slow them down too much. In other words, our biggest process-oriented challenges have been balancing the need to meet quality and regulatory requirements through embedding specific tasks into clinicians' workflows while not slowing them down so that they feel as though that's all they're doing.

OUR BIGGEST PROCESS-ORIENTED CHALLENGES HAVE BEEN BALANCING THE NEED TO MEET QUALITY AND REGULATORY REQUIREMENTS THROUGH EMBEDDING SPECIFIC TASKS INTO CLINICIANS' WORKFLOWS WHILE NOT SLOWING THEM DOWN SO THAT THEY FEEL AS THOUGH THAT'S ALL THEY'RE DOING. —*BRIAN PATTY, M.D.*

HCI: In what areas do you think your team's work has stood out the most?

Patty: Our vendor has a tool called iForms, which are basically HTML-based order sets, so they look like little mini-web pages. We actually brought in some designers to work on these, with workflow in mind, and they are in great demand among our clinicians. We've got about 160 out there now; each order set takes the team about 40-60 hours to create, so they're very labor-intensive to create, but they're very easy for the clinicians to use, so we can pull in things like decision scenarios. That means that we can present clinicians with a decision tree; can do weight-based dosing on medications, specifically on our pediatric population; and we can pull information in from the rest of the EHR, like labs or other patient values, right at the time a physician is making the decision, so they don't have to go outside the order set to look things up; so it really improves the workflow of the ordering process.

GETTING PHYSICIANS ON BOARD

HCI: How do you achieve consensus on order sets with your physicians?

Patty: Rather than creating a new committee for that, we built the design and approval for order sets into the clinical councils, which are essentially departmental meetings. So our team goes to the surgery department clinical council, the cardiology department clinical council, and so on, and talks with the physicians, so that they understand what the challenges are for the providers, but also engage with them on the design and upkeep on the order sets around what is pertinent for them.

ONE OF THE THINGS I'VE ENCOURAGED MY TEAM TO DO HAS BEEN NOT JUST TO TRAIN ON THE TECHNICAL TOOLS, BUT TO ENGAGE ON THE WORKFLOW. —*BRIAN PATTY, M.D.*

HCI: What are the issues around the interoperability and integration of all these clinical systems, for optimized end-user integration?

Patty: Obviously, if we can get a system to integrate with our core EHR, that's the best; but if not, we try to use our physician portal to help the physicians navigate, so they can have a one-stop shop for getting their work done.

HCI: So they use the portal to access everything?

Patty: Exactly; and the portal is fairly facile about being able to link to other systems that don't necessarily integrate fully with the EHR, yet in a way that makes it look seamless to the physicians.

LESSONS LEARNED

HCI: What are the key lessons you've learned to date around creating process change?

Patty: One of the things I've encouraged my team to do has been not just to train on the technical tools, but to engage on the workflow. We involve end-users in designing our training, so that we can make sure that we understand current workflow, and design and train the new workflow based on the best integration of that new tool into the work of the clinician—whether physician, nurse, etc., so that we're not just training the technical aspects of the tool. In other words, we try not to layer a technical solution on top of a bad workflow; instead, we try to redesign the workflow at the same time, so that we now have an improved workflow for the clinician as well.

HCI: What have been your particular lessons learned as a CMIO directing a team of informaticists?

Patty: I think it's all about engaging stakeholders early in any process, and getting my team to really involve stakeholders in all aspects of a project from start to finish, so that we understand the challenges that we're going to face as we roll something out.

HCI: It inevitably ends up being about people and process, right?

Patty: Absolutely. I really reiterate that to my team that it's less about the technology we're introducing, and more about the workflow and process around that technology. ◆

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FEATURE

The Next Wave

IN THE NEW WORLD OF ACCOUNTABLE, TRANSPARENT CARE, CMIOs WILL BE ESSENTIAL TO ORGANIZATIONAL SUCCESS BY MARK HAGLAND

EXECUTIVE SUMMARY:

As healthcare moves forward towards new, more accountable paradigms, CMIOs in patient care organizations nationwide are finding their positions becoming more and more focused on clinical transformation and process improvement. With such evolutionary changes are coming increased staff support, new reporting relationships, and even title changes.

What's going on at Texas Health Resources (THR), the Arlington, Texas.-based integrated health system, is emblematic of what's happening more broadly in healthcare, as CMIOs—alternatively designed as chief medical information or chief medical informatics officers—at patient care organizations nationwide are seeing their profiles raised ever higher. At THR, Ferdinand Velasco, M.D., who has been CMIO for 10 years, in June became chief health information officer (CHIO) of the 24-hospital, 4,100-bed health system, and reports to three different THR executives. Velasco will continue to report to the organization's CIO, Ed Marx, but now also reports to the organization's chief operations officer and chief clinical officer, two individuals whose office combines joint responsibility for the clinical and operations sides of the entire organization. Meanwhile, the individual who had been the associate CMIO has been promoted to CMIO and continues to report to Velasco, while the chief nursing information officer (CNIO) also continues to report to him.

Ferdinand Velasco, M.D.

At first blush, this might sound like a whole lot of organizational musical chairs, but Velasco notes that, at THR, "The focus has been on engaging physicians and getting them to adopt the electronic health record. The CHIO role will encompass the physician areas," he says, "but will also broaden out to all clinician stakeholders, across both the inpatient and ambulatory spheres and into the home. People tend to think of ambulatory as clinics and physician practices. Now, with health IT, you'll have the capability to extend the reach into the home and anywhere people are connected." What's more, he notes, a few other pioneering organizations have already taken the step to broaden out the CMIO role to a "CHIO" role; he cites the Danville, Pa.-based Geisinger Health System and the Oregon Health & Sciences University Hospital, in Portland, Ore.

THE CHIO ROLE WILL ENCOMPASS THE PHYSICIAN AREAS, BUT WILL ALSO BROADEN OUT TO ALL CLINICIAN STAKEHOLDERS, ACROSS BOTH THE INPATIENT AND AMBULATORY SPHERES AND INTO THE HOME. *—FERDINAND VELASCO, M.D.*

If expanding the CMIO role out into the far reaches of integrated health systems is a natural transition, so, too, is the broadening of the CMIO role into transforming care delivery and becoming intensely involved in quality and performance improvement. That's what's happening at the St. Paul, Minn.-based HealthEast Care System, where CMIO Brian Patty, M.D. is leading a healthcare informatics team of more than 40 clinical informaticists that is leveraging clinical IT in the pursuit of the organization's quality improvement goals.

"Our primary focus is to work closely with our quality department, and really find out what their priorities are," Patty says. "We focus the decision support tools that we deploy based on what we feel will best help us focus our quality work. So where are the pain points in some of our quality initiatives, and what can we do with our EHR and with some of our clinical decision support tools, to help

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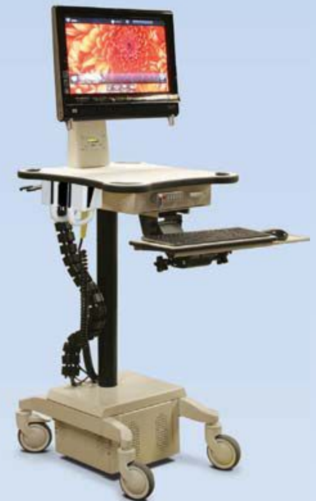

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out?" For his team's exceptional work in all these areas, the HealthEast Care System healthcare informatics team won the Healthcare Informatics/AMDIS IT Innovation Advocate Award for 2012, sponsored by *HCI* and by the Association of Medical Directors of Information Systems.

Brian Patty, M.D.

Among other things, Patty's team has facilitated several comprehensive implementations, including a full-replacement computerized physician order entry (CPOE) system, a broadly interoperable clinical documentation system; barcoded medication administration, pharmacy management, and a comprehensive physician portal; has developed an advanced clinical decision support (CDS) system to incorporate innovative web-based physician order sets; and has implemented a data warehouse in an online analytical processing (OLAP) environment, to facilitate financial, operational, and quality retrospective analytics.

A STRATEGIC, PROCESS-ORIENTED ROLE

Industry experts agree that CMIOs are rapidly moving into a new era in which they are leading clinical and organizational transformation. The position, says Mark Van Kooy, M.D., director of clinical informatics at the Denver-based Aspen Advisors, "has gone from someone who was just the link to the docs, someone trying to bring the docs along, to a role that really has to help meet the expectations created by the entire data-based infrastructure for managing value-based care," says the Sewell, N.J.-based Van Kooy, who recently served as a CMIO for five years before joining Aspen, "So that really compels the physician to be in the hot seat for transformation." Van Kooy, who is a master black belt in Six Sigma and has consulted on that methodology, adds that he believes that CMIOs will increasingly need to be highly fluent in improvement methodologies and process leadership in order to be effective in their increasingly transformation-focused roles.

Kip Webb, M.D., M.P.H., executive director of Accenture Clinical Services, the global clinically oriented practice of the New York-based Accenture, says the growing focus on transformation is also of necessity altering CMIOs' positions in their organizations, in line with what THR's Velasco and HealthEast's Patty have been experiencing. "It's evolving, and I think, in some very hopeful ways," says the San Francisco-based Webb. "Historically, the CMIO has been a chief with no Indians; so they're typically a younger doctor, although not necessarily. And they're typically pretty tech-oriented, but historically have not had either the clout in terms of staff, or the organizational clout, to get things done, so they've historically focused on the technology."

Now, as the CMIO position is becoming more and more strategic, "They are starting to build up groups of informaticists who can help them to execute," Webb emphasizes. Most importantly, he says, "Their institutions have started to value what they can deliver; they've said, this is core to what we need to do." Fortunately, at the same time as their CMIOs' roles have been maturing, CMIOs have been reaching out to each other through such channels as the AMDIS listserv.

Given these developments, all of those interviewed for this article agree that the C-suite executives, including CIOs in patient care organizations, will need to think as broadly and strategically about the CMIO role as possible, particularly as their organizations move forward into the new healthcare world. "My advice," concludes THR's Velasco, "would be to conceive of the CMIO and the CHIO roles in the context of the accountable care transition, rather than simply as an implementational leader; because while the implementation aspects are important, they need to be embedded in the work towards population health, analytics, and quality and care management." ◆

> **WHERE ARE THE PAIN POINTS IN SOME OF OUR QUALITY INITIATIVES, AND WHAT CAN WE DO WITH OUR EHR AND WITH SOME OF OUR CLINICAL DECISION SUPPORT TOOLS, TO HELP OUT? —*BRIAN PATTY, M.D.***

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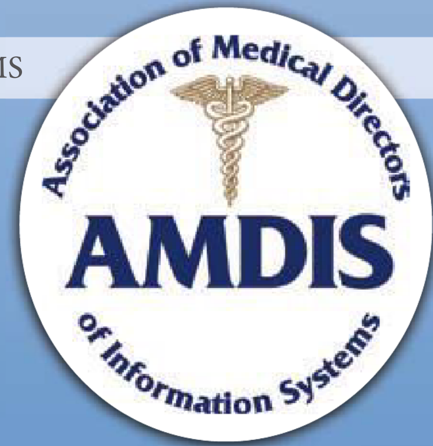

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Integrating Telehealth and the EHR

ORGANIZATIONS MAKE PROGRESS REMOTELY LINKING PHYSICIANS AND PATIENTS, BUT DOCUMENTING THE REMOTE CONSULT WILL REQUIRE MUCH INTEGRATION WORK BY JENNIFER PRESTIGIACOMO

EXECUTIVE SUMMARY:

Here's a look at several HRSA Office for Advancement of Telehealth grantee organizations and their recommendations for what CIOs, CTOs, and CMIOs need to do to achieve integration and interoperability in telehealth.

Ulfat Shaikh, M.D., at the UC Davis Health System Telemedicine Clinic located in Sacramento, Calif., is doing a pediatric consultation with an adolescent patient and her grandmother in Oroville, Calif. Photo: UC Davis Children's Hospital

Leaders at healthcare organizations across the country are finding innovative ways to use video conferencing devices to meet the specialty care needs of rural patients. A look at the Health Resources and Services Administration (HRSA) Office for Advancement of Telehealth (OAT) grantees shows that these organizations are making clear headway in linking their physicians and patients remotely, but work still needs to be done to digitally collect and document the remote consult within the electronic health record (EHR).

OAT administered grants to 36 telemedicine projects, totaling more than $10.3 million, from 2009 through 2011. Projects like these are contributing to a growing telehospital market, which was worth $8.1 billion in 2011 and is expected to grow to $17.6 billion in 2016, according to BCC Research (Wellesley, Mass.).

However, meaningful use did not specifically address telehealth; so even with this market's growth, Gary Capistrant, senior director of public policy at the American Telemedicine Association, believes there will be many frontiers before integration can occur between telemedicine hardware and EHRs. "Ultimately, that's an issue for the EHR vendors to deal with, not the hospitals," Capistrant says. "[Hospitals] may want to be able to do it, but if [vendors] don't provide functionality, it doesn't happen. And what the [vendors] do is driven a lot by meaningful use, and telehealth doesn't seem to be a priority by the ONC."

LINKING REMOTE PEDIATRIC NETWORK CONSULTS

Many organizations, including the 118-bed University of California Davis Children's Hospital (UCDCH) in Sacramento, have had to create work-

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FEATURE

A UC Davis Children's Hospital pediatrician is consulting with James Marcin, M.D., director, Pediatric Telemedicine Center for Health and Technology, UCDCH, on a patient with a traumatic injury. Photo: UC Davis Children's Hospital

arounds to digitally document their telemedicine consults. UCDCH is halfway through the process of linking up 11 partners in Northern California to its existing Pediatric Emergency Telemedicine Network of eight emergency departments that offers remote critical care consults. Each site in the network has a high-resolution videoconferencing unit (Cisco) that uses a VPN tunnel to establish an encrypted, secure link between the two sites.

To keep information exchange between each rural hospital and UCDCH inexpensive and sustainable, the UCDCH physician asks the treating physician or nurse for vitals or lab results via phone, fax, or by simply looking at the monitors via video-conference. There are ways to create more IT integration within the program, but doing so adds expense and complications, says James Marcin, M.D., professor, pediatric critical care medicine, and director, Pediatric Telemedicine Center for Health and Technology, UCDCH. "You can theoretically have a repository where all the sites can be standardized and give it to the doctor, get the labs in a standard way, but those are resource-intensive programs," he adds.

WHAT THE [VENDORS] DO IS DRIVEN A LOT BY MEANINGFUL USE, AND TELEHEALTH DOESN'T SEEM TO BE A PRIORITY BY THE ONC. —*GARY CAPISTRANT*

In the absence of IT integration, telemedicine equipment should at least maximize standard protocols for better intercommunication, says Juan Trujano, IT supervisor, Department of Pediatrics, UCDCH. His department ensured that it purchased teleconferencing devices that use the H.323 IP communication standard. "That's very important to us because we want to call any other institution that has a similar machine," he adds, "so [by using a] standard it doesn't have to be brand [-dependent]."

WHEN WE WERE FIRST LOOKING AT TECHNOLOGIES, WE WANTED SOMETHING THAT WAS VERSATILE AND THAT WE WEREN'T LIMITED TO A POINT TO POINT CONNECTION, SO HAVING A TECHNOLOGY THAT RAN OFF OF A WIRELESS PLATFORM WAS SOMETHING WE WERE VERY INTERESTED IN. —*TIFFANY WHITMORE*

REACHING UNDERSERVED COMMUNITIES

Another organization that is facing challenges with digitizing its telemedicine efforts is the University of Arkansas for Medical Sciences (UMAS), which participates in the Arkansas START (System To Access Rural Telecolposcopy) program to offer telecolposcopy in three underserved rural communities, covering gaps in follow-up gynecological care for Medicaid patients.

As a part of the program, there are four telehealth sites that operate weekly, half-day clinics and can each provide up to 10 women, who have had abnormal pap smears, with real-time telecolposcopic evaluations. Since 2006, the START program has treated 3,023 patients.

When a patient visits the local telehealth site, she is seen by a technician. A gynecologist and expert colposcopist at UAMS in Little Rock, Ark. watch all

the sites at the same time via a clinical teleconferencing system (Tandberg, New York, N.Y.) and a video colposcope (Welch-Allyn, Skaneateles Falls, N.Y.) that uses high-speed T1 data lines. The expert colposcopist speaks with the onsite colposcopist and then provides a colposcopic impression, recorded on paper at the hub site, and decides where to biopsy if needed.

Even though UAMS has an EHR, the colposcopy information cannot be input into the system without that patient receiving a bill, which would be against grant requirements; so all paper records from the rural site and UAMS are faxed, scanned on to secure hard drives, and placed in the patient's folder. Currently, UAMS has a proposal to replace the inpatient and outpatient EHRs with an enterprise system to reduce paper processes.

VERSATILE TECHNOLOGY

Close to five years ago, the Boise, Idaho-based Saint Alphonsus Health System began developing its telemedicine network for multiple applications among its four-hospital, 714-bed integrated healthcare system that have, as of January this year, saved the system $1.7 million in medical transport costs and has allowed more patients to be treated in their local communities.

"We wanted to develop multiple applications for a single technology so we didn't have equipment that wasn't being used very frequently, and so the project would be more sustainable," says Tiffany Whitmore, director of system development and telemedicine, Saint Alphonsus Regional Medical Center (SARMC).

Saint Alphonsus has implemented 16 remote-presence robotic systems (the RP-7i and RP-Lite, a dual-purpose workstation, from the Santa Barbara, Calif.-based InTouch Health) in 12 sites that provide a broad swath of medical and social inpatient and outpatient specialty services, including telepsychiatry, maternal fetal medicine, sign language interpretation, and even genetic counseling.

"When we were first looking at technologies, we wanted something that was versatile and that we weren't limited to a point to point connection, so having a technology that ran off of a wireless platform was something we were very interested in," says Whitmore.

Nichole Whitener, health system research administrator, stroke center director, SARMC, the only tertiary referral center for stroke in Idaho, says its telestroke program was initiated to help decrease death and disability from stroke by getting patients treated sooner.

Four neurologists in this program use an encrypted laptop to control a robotic video conferencing device to perform different assessments like zooming in to see pupil dilation or directing a patient to repeat sentences to check for slurred speech. If a stroke has occurred, then a stroke medication can be prescribed in the recommended one to three-hour treatment window.

If the patient stays at the local facility, the SARMC physician dictates into that rural hospital system's dictation line, which is transcribed and input into the EHR. But if the patient is transferred to SARMC, the physician dictates into the SARMC system and copies the referring site. However, communication is still a challenge.

"One limitation to telemedicine is that it is difficult for remote physicians to be the admitting physician, so they have to communicate very clearly to the physicians who are going to be admitting that patient," says Whitener. "We just need to make sure that all information is communicated." ◆

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(Continued fromv p. 38)

Carlton says. The information is fed directly into the electronic medical record, he says.

Asked how Alpine's physicians have benefitted from the Greenway software, Carlton points to the immediacy and accessibility of the information. "As soon as they do their note, it's accessible to other physicians who are on call during the weekend or evenings," he says. Prescribed medications are filed electronically and easily tracked to the pharmacy that filled the order, he says.

David Willis, M.D., is a family practice physician in Ocala, Fla. and medical director of the Healthy Ocala health information exchange, as well as the current president of the Marion County Medical Society. Willis has been using Greenway's PrimeSUITE solution package, which includes an integrated EHRs and practice management feature, for about two years. He has gradually been expanding into other solutions as well.

In his experience, the solution packages are both robust and flexible. Seamless interoperability of the integrated solutions, with Greenway acting as a central information hub, is a key advantage, he says.

One valuable feature of the product line is a strong template system, Willis says. "You can create a lot of discrete data points and put in information about your encounter, and there are tools where you can actually build your own templates," he says. He adds that there is an extensive free library to do that, and that templates are sharable between practices.

Willis has recently expanded his user portfolio with Greenway's research solution, which has enabled his practice to participate in clinical trials, which led to his participation in an osteoarthritis study of the knee. When he expressed interest in the study, he was contacted by the sponsors, through Greenway, with the chart numbers of potential candidates. Willis contacted the patients and explained the study to them so they could make the decision to participate. Greenway "processes the information from the research agency and there is very little I have to do," he says.

In January Willis used Greenway's Meaningful Use Dashboard to achieve Stage 1 attestation. "It teaches you to document correctly so the system will capture the measure point. If I see that I am short on a measure, I can drill down to get to the actual patient and update the information," he says. After three months of reporting, the actual attestation process took just 27 minutes, he says. ◆

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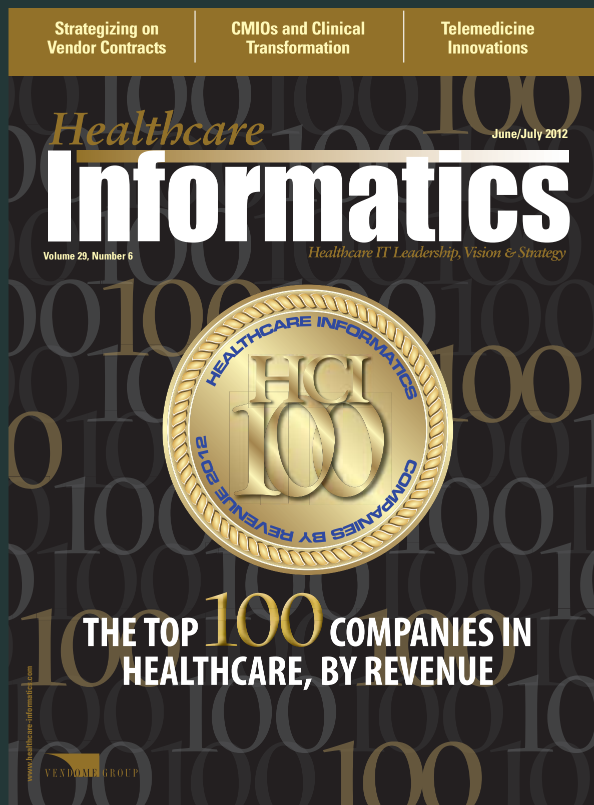

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