HCI HEALTHCARE INFORMATICS

HEALTHCARE IT LEADERSHIP, VISION & STRATEGY

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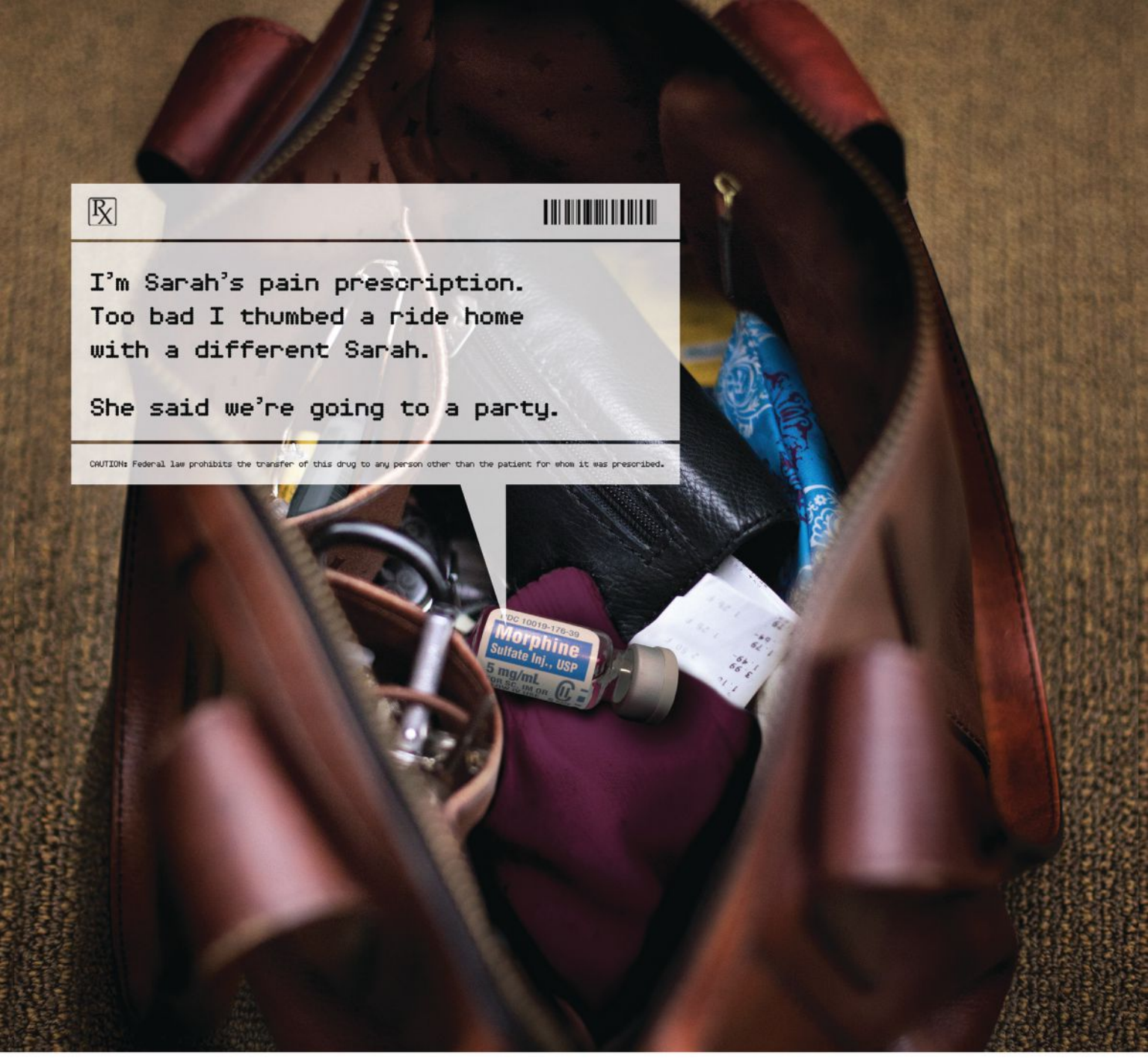
A VENDOME PUBLICATION

HCI 100

THE TOP 100 COMPANIES BY REVENUE

- MOST INTERESTING VENDORS IN HEALTH I.T.
- DATA ANALYTICS BECOMES REAL
- HOT NEW VENDORS COMING UP



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Note: teamplay is currently under development and not for sale in the U.S., China and other countries. Due to regulatory reasons, its future availability cannot be guaranteed. Please contact your local Siemens organization for further details.

Answers for life.

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COVER STORY

HCI 100 MOST INTERESTING VENDORS

Healthcare Informatics presents profiles of our "Most Interesting Vendors," healthcare IT vendor firms making waves in the industry, and whose trajectories speak to broader trends. Here are profiles of four noteworthy companies.

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HCI 100 UP AND COMERS

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Have You Met the Four Villains of Decision-Making?

Mark Hagland

Thinking narrowly and being over-confident can prove disastrous when it comes to scanning the landscape to plan for the future

Every single adult human being regularly participates in decision-making processes, and yet making decisions is so often a fraught, minefield-strewn process, isn't it? I was fascinated to come across a book on the topic: "Decisive: How to Make Better Choices in Life and Work," by Chip and Dan Heath, brother authors who co-wrote "Switch and Made to Stick"—books about creating change and building ideas that last, respectively.

What the Heath brothers offer in "Decisive" is a very useful set of questions and thoughts for how to successfully engage in decision-making. I loved their schematic of the "four villains of decision-making." The four are as follows:"narrow framing, which is the tendency to define our choices too narrowly, so we see them in binary terms"; confirmation bias, which he describes as "our normal habit in life to develop a quick belief about a situation and then seek out information that bolsters our belief"; "short-term emotion"; and finally, overconfidence. As the brother-authors put it: "The problem is that we don't know what we don't know.

The story that the Heaths tell about overconfidence in decision-making is absolutely golden. They write: "Our search for the final villain of decision-making takes us back to January 1, 1962, when a young four-man rock-and-roll group named the Beatles was invited to audition in London for one of the two major British record labels, Decca Records. 'We were all excited,' recalled John Lennon. 'It was Decca.' During an hour-long audition, they played fifteen different songs, mostly covers. The Beatles and their manager, Brian Epstein, were hopeful they'd get a contract, and they waited anxiously for a response." The verdict? No go. "In a letter to Epstein," they write, "Dick Rowe, a prominent talent scout at Decca Records, wrote, 'We don't like your boys' sound. Groups are out; four-piece groups with guitars, particularly, are finished.'" Quite the futurist, wasn't he??

Meanwhile, fast-forwarding to the present moment in U.S. healthcare, a quote widely attributed to Yogi Berra comes to mind: "The future ain't what it used to be!" Indeed, the pace and intensity of change in our industry at the present moment are absolutely mind-boggling for everyone, and in fact, many are overwhelmed. Trying to predict trends can be positively paralyzing, and yet all of us in healthcare are finding ourselves compelled to take action based on our best understandings of how trends might be playing out, even as we all know that the future of our industry will involve concepts such as population health, value-based delivery and payment, and patient-centrism.

How well might you be able to predict the trajectory of the healthcare IT vendor space? This issue includes our annual *Healthcare Informatics* 100 (p. 8), a unique compendium of data about the largest healthcare IT vendors by revenue, as well as a whole package of content around that compendium, which has become a unique informational resource for the healthcare industry. That package also includes our Most Interesting Vendors features (p. 31), in which we look at several vendor companies whose trajectories we believe help illuminate the broader overall trajectory of the healthcare IT vendor sector; as well as Up and Comers (p. 44), portraits of smaller vendors really making their moves.

We hope you'll enjoy this issue's cover story package, and will find it useful to you. Just remember the Heath brothers' advice on decision-making, and when scanning the landscape in order to make decisions going forward, do make sure you don't pass by that boy band from Liverpool because you think that boy bands with guitars are passé.

Mark Hagland
Editor-in-Chief

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Healthcare Informatics 100 Companies by Revenue

Our Annual Ranking of Healthcare IT Vendors

Once again, as in past years, we, the editors of *Healthcare Informatics,* are proud to present the newest edition of our 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 U.S.-based HIT-based revenues is eligible to submit its figures.

Meanwhile, our Up and Comers report provides information on six smaller-but-rising companies with product offerings and trajectories worth watching, (page 44). This year, we look at Apervita, EarlySense, Health Fidelity, HealthSpot, Propeller Health, and Validic.

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

Thank you, and enjoy.
The Editors of *Healthcare Informatics*

OUR METHODOLOGY AND EXPERTS

As in past years, two firms were instrumental in helping our team of editors research, complete, and finalize the 2014 revenue figures for this year's *Healthcare Informatics* 100 compendium, Porter Research and ST Advisors. The Porter Research and ST Advisors teams worked closely with members of the *HCI* editorial team, continuously updating and synthesized submitted and gathered data and information, prior to the final assembly of the list itself.

The sales figures were compiled and reviewed by Porter Research, which consulted with both its own staff and with business contacts in order to ensure the inclusion of deserving companies, as well as fairness in the reporting of those companies submitting data.

For those firms that did not disclose their sector-specific or U.S.-specific revenues, Porter, working with ST Advisors, worked to estimate data based on patterns of previous years' revenue arcs derived from a variety of available sources of industry data and trusted industry contacts. We believe that the estimates finalized in this compendium represent a fair approximation of the revenues of those companies included on the list, and of their relative influence in the industry.

The Atlanta-based Porter Research (www.PorterResearch.com), an affiliate of billion inc. and sister company to Billians 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 major healthcare sectors—payers, providers, and vendors.

ST Advisors (www.st-advisors.com) offers both long-term and project-based relationships to healthcare IT 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 advisory board.

Our sincere thanks go to Cynthia, Ben, and their colleagues, for their time and input in helping us to assemble this year's compendium.

HCI 100 COMPANIES BY REVENUE

1 ‘15 **12** ‘14

Optum | Eden Prairie, MN | 888-445-8745 | www.optum.com

HIT Revenue: $5,227,000,000 (14) **$1, 180,000,000 (13)** **$1,150,000,000 (12)**
Major Revenue: n/a

2 ‘15 **2** ‘14

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

HIT Revenue: $3,400,000,000 (14) **$2,900,000,000 (13)** **$2,700,000,000 (12)**
Major Revenue: 78% services, 14% software, 8% hardware

3 ‘15 **1** ‘14

McKesson | Alpharetta, GA

HIT Revenue: $3,120,000,000 (14)

4 ‘15 **3** ‘14

Dell | Round Rock, TX | 972-577-0000 | www.dell.com/healthcare

HIT Revenue: $2,900,000,000 (14) **$2,894,062,500 (13)**
Major Revenue: 5% Software, 40% Hardware, 55% Services

5 ‘15 **6** ‘14

Cognizant | Teaneck, NJ | 201-801-0233 | www.cognizant.com

HIT Revenue: $2,700,000,000 (14) **$2,267,000,000 (13)** **$1,935,000,000 (12)**
Major Revenue: 0.4% Software, 99.6% Services

6 ‘15 **4** ‘14

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

HIT Revenue: $2,677,000,000 (14) **$2,800,000,000 (13)** **$2,600,000,000 (12)**

7 ‘15 **n/a** ‘14

Xerox | Norwalk, CT | 877-414-2676 | www.services.xerox.com/healthcare-solutions/enus.html

HIT Revenue: $2,350,342,656 (14) **$2,227,322,176 (13)** **$2,086,391,434 (12)**
Major Revenue: 25% Software, 75% Services

8 ‘15 **7** ‘14

Siemens* | Malvern, PA | 888-826-9702 | usa.healthcare.siemens.com

HIT Revenue: $1,991,000,000 (14) **$1,810,000,000 (13)** **$1,760,000,000 (12)**
*Industry analysts’ estimates.

COMPANIES BY REVENUE

9 '15 / 8 '14

Epic Systems Corp.* | Verona, WI | 608-271-9000 | www.epic.com

HIT Revenue: $1,800,000,000 (14) **$1,750,000,000 (13)** **$1,526,000,000 (12)**
Major Revenue: 60% Software, 40% Services
*Industry analysts' estimates.

10 '15 / 9 '14

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

HIT Revenue: $1,500,000,000 (14) **$1,500,000,000 (13)**
*Industry analysts' estimates.

11 '15 / 10 '14

Allscripts | Chicago, Il | 800-334-8534 | www.allscripts.com

HIT Revenue: $1,377,873,000 (14) **$1,373,100,000 (13)** **$1,465,000,000 (12)**
Major Revenue: 17% Software, 83% Services

12 '15 / 11 '14

Emdeon, Inc. | Nashville, TN | 615-932-3000 | www.emdeon.com

HIT Revenue: $1,350,413,000 (14) **$1,242,567,000 (13)** **$1,152,313,000 (12)**
Major Revenue: 84% Software, 16% Services

13 '15 / 13 '14

CSC | Falls Church, VA | 703-876-1000 | www.csc.com

HIT Revenue: $1,299,800,000 (14) **$1,161,850,000 (13)** **$1,161,850,000 (12)**
Major Revenue: 1.5% Software; 98.5% Services

14 '15 / n/a '14

Conifer Health Solutions | Frisco, TX | 469-803-3000 | coniferhealth.com

HIT Revenue: 1,200,000,000 (14) **$900,000,000 (13)** **$488,000,000.00 (12)**
Major Revenue: 100% Services

15 '15 / 18 '14

Leidos Health | Reston, VA | 877-652-4099 | www.leidoshealth.com

HIT Revenue: $980,100,000 (14) **$678,164,000 (13)** **$610,893,000 (12)**

16 '15 / 15 '14

Nuance Communications | Burlington, MA | 781-565-5000 | nuance.com/for-healthcare

HIT Revenue: $942,700,000 (14) **$911,600,000 (13)** **$669,400,000 (12)**
Major Revenue: 93% Software, 7% Services

HCI 100 COMPANIES BY REVENUE

17 '15 / 14 '14

EMC* | Hopkinton, MA | 508-435-1000 | www.emc.com

HIT Revenue: $925,000,000 (14) **$925,000,000 (13)** **$925,000,000 (12)**
Major Revenue: 40% Software; 40% Hardware; 20% Services
*Industry analysts' estimates.

18 '15 / 16 '14

Infosys | Rockville, MD | 301-354-8600 | www.infosys.com

HIT Revenue: $828,030,000 (14) **$825,000,000 (13)** **$679,237,000 (12)**
Major Revenue: 51.7% Software, 48.3% Services

19 '15 / 22 '14

athenahealth | Watertown, MA | 800-981-5084 | www.athenahealth.com

HIT Revenue: $752,599,000 (14) **$595,003,000 (13)** **$422,271,000 (12)**
Major Revenue: 95% Software, 5% Services

20 '15 / 19 '14

Wolters Kluwer Health | Philadelphia, PA | 215-521-8300 | www.wolterskluwerhealth.com

HIT Revenue: $748,000,000 (14) **$678,000,000 (13)** **$621,000,000 (12)**
Major Revenue: 79% Software, 21% Services

21 '15 / 21 '14

3M Health Information Systems | Salt Lake City, Utah | 801-367-2447 | www.3Mhis.com

HIT Revenue: $689,000,000 (14) **$603,300,000 (13)** **$543,000,000 (12)**
Major Revenue: 79% Software, 1% Hardware, 20% Services

22 '15 / 60 '14

Wipro Technologies | East Brunswick,NJ | 732-509-1500 | www.wipro.com

HIT Revenue: $682,746,580 (14)
Major Revenue: 15% Software, 5% Hardware, 80% Services

23 '15 / 27 '14

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

HIT Revenue: $574,229,000 (14) **$502,301,000 (13)** **$215,000,000 (12)**
Major Revenue: 100% Software

24 '15 / 24 '14

Oracle | Redwood Shores, CA | 650-506-7000 | www.oracle.com

HIT Revenue: ** Industry analysts' estimates rank company in top quartile (14)
**Industry analysts' estimates rank company in top quartile.

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25 '15 / 25 '14

IBM | Armonk, NY | www.ibm.com

HIT Revenue: ** Industry analysts' estimates rank company in top quartile (14)
**Industry analysts' estimates rank company in top quartile.

26 '15 / n/a '14

Truven Health Analytics | Ann Arbor, MI | 855-878-8361 | truvenhealth.com

HIT Revenue: $544,475,000 (14)

27 '15 / 23 '14

Medical Information Technology, Inc. (MEDITECH) | Westwood, MA | 781-821-3001 | www.meditech.com

HIT Revenue: $517,002,274 (14) **$579,645,457 (13)** **$597,838,787 (12)**
Major Revenue: 40% Software, 60% Services

28 '15 / 28 '14

Quality Systems Inc. (NextGen) | Irvine, CA | 949-255-2600 | www.nextgen.com

HIT Revenue: $444,667,000 (14) **$460,229,000 (13)** **$429,835,000 (12)**
Major Revenue: 17.4% Software, 1.8% Hardware, 80.8% Services

29 '15 / n/a '14

Omnicell | Mountain View, CA | 800-850-6664 | www.omnicell.com

HIT Revenue: $441,000,000 (14) **$381,000,000 (13)** **$314,000,000 (12)**
Major Revenue: 76% Hardware; 18% Services; 6% Software

30 '15 / 30 '14

NetApp* | Sunnyvale, CA | 408-822-6000 | www.netapp.com

HIT Revenue: $438,350,000 (14) **$398,500,000 (13)** **$360,000,000 (12)**
Major Revenue: 35% Software, 47% Hardware, 18% Services
*Industry analysts' estimates.

31 '15 / 17 '14

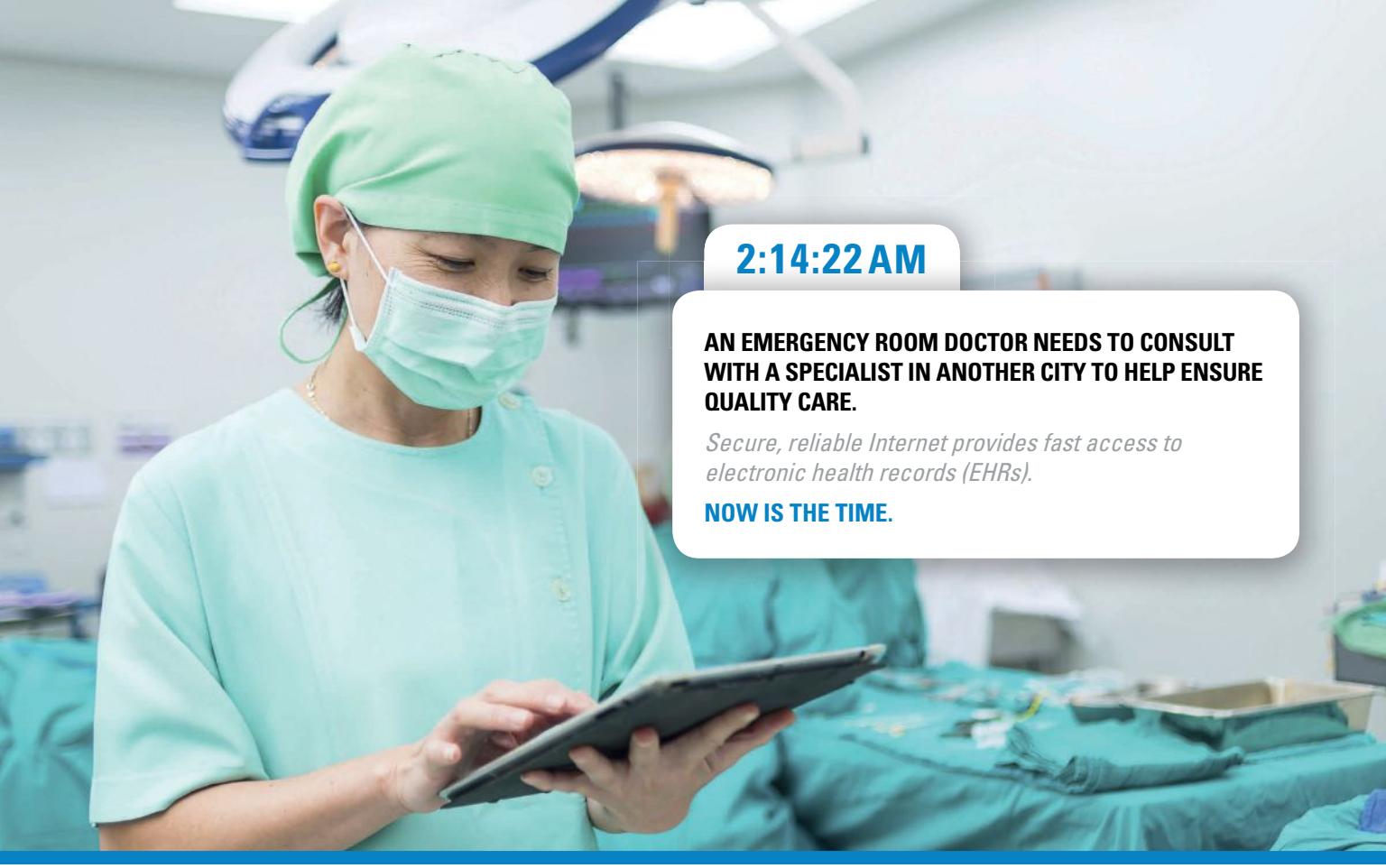
MedAssets, Inc. | Alpharetta, GA | 678-235-2500 | www.medassets.com

HIT Revenue: $428,866,000 (14) **$390,941,000 (13)** **$373,206,000 (12)**
Major Revenue: 75% Software, 25% Services

32 '15 / 33 '14

InterSystems | Cambridge, MA | 617-621-0600 | www.intersystems.com

HIT Revenue: $391,200,000 (14) **$370,400,000 (13)** **$354,480,000 (12)**
Major Revenue: 100% Software



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33 '15 / 31 '14

Northrop Grumman Corp.* | Falls Church, VA | 703-280-2900 | www.northropgrumman.com

HIT Revenue: $382,000,000 (14) **$382,000,000 (13)** **$417,000,000 (12)**
Major Revenue: 64% Software, 33% Services, 3% Hardware
*Industry analysts' estimates.

34 '15 / 32 '14

Greenway Health, LLC * | Carrollton, GA | 866-242-3805 | www.greenwayhealth.com

HIT Revenue: $375,000,000 (14) **$378,000,000 (13)** **$124,000,000 (12)**
*Industry analysts' estimates.

35 '15 / n/a '14

Inovalon | Bowie, MD | 301-809-4000 | www.inovalon.com

HIT Revenue: $361,540,000 (14)

36 '15 / 34 '14

SAS | Cary, NC | 919-531-8000 | www.sas.com

HIT Revenue: $358,825,662 (14) **$348,198,158 (13)** **$306,798,562 (12)**
Major Revenue: 85% Software, 15% Services

37 '15 / 29 '14

M*Modal | Franklin, TN | 800-233-3030 | mmodal.com

HIT Revenue: $348,300,000 (14) **$411,000,000 (13)** **$450,722,000 (12)**
Major Revenue: 20% Software, 80% Services

38 '15 / 35 '14

Infor* | New York, NY | 646-336-1700 | www.infor.com

HIT Revenue: $346,500,000 (14) **$346,500,000 (13)** **$278,000,000 (12)**
Major Revenue: 21% Software, 79% Services
*Industry analysts' estimates.

39 '15 / 38 '14

eClinicalWorks | Westborough, MA | 508-836-2700 | www.eclinicalworks.com

HIT Revenue: $333,025,000 (14) **$269,745,626 (13)** **$260,100,000 (12)**
Major Revenue: 60% Software, 40% Services

40 '15 / 36 '14

HealthPort | Alpharetta, GA | 770-360-1700 | www.healthport.com

HIT Revenue: $320,000,000 (14) **$306,000,000 (13)** **$276,000,000 (12)**
Major Revenue: 50% Software; 50% services

41 '15 / n/a '14

Verisk Analytics | Jersey City, NJ | 800-888-4476 | www.veriskhealth.com

HIT Revenue: $314,410,680 (14)

42 '15 / 37 '14

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

HIT Revenue: $286,650,000 (14) **$273,000,000 (13)** **$208,800,000 (12)**
*Industry analysts' estimates.

43 '15 / 41 '14

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

HIT Revenue: $252,641,000 (14) **$220,694,512 (13)** **$200,631,375 (12)**
Major Revenue: 80% Software, 15% Hardware, 5% Services

44 '15 / 43 '14

Premier Inc. | Charlotte, NC | 877-777-1552 | www.premierinc.com

HIT Revenue: $232,408,000 (14) **$205,214,000 (13)** **$177,000,000 (12)**
Major Revenue: 60% Software, 40% Services

45 '15 / 40 '14

NTT Data | Plano, TX | 800-699-6773 | www.nttdata.com/ushealthcaretechnologies

HIT Revenue: $230,000,000 (14) **$230,000,000 (13)** **$210,000,000 (12)**
Major Revenue: 17% Software, 3% Hardware, 80% Services

46 '15 / 44 '14

Experian Health/Passport | Franklin, TN | 888-661-5657 | www.experian.com/health

HIT Revenue: $230,000,000 (14) **121,000,000 (13)** **$56,000,000 (12)**
Major Revenue: 90% Software, 10% Services

47 '15 / 39 '14

Merge Healthcare | Chicago, IL | 312-565-6868 | www.merge.com

HIT Revenue: $212,304,000 (14) **$232,000,000 (13)** **$249,000,000 (12)**
Major Revenue: 17.8% Software, 66.1% Services, 16.1% Hardware

Identifying Opportunity in Hospital Denials Data through Predictive Modeling

by Paul Bradley

The massive scale of claims data and the large number of individual denial-related data points make finding meaningful—and non-obvious—correlations all but impossible without advanced statistical and predictive algorithms. But by leveraging such algorithms to build out predictive mathematical models, it's possible to detect hidden patterns and identify previously unknown discrete pockets of claims that will almost certainly be denied, and then catch those claims before they go out the door.

Further, through the subsequent application of machine learning, it is possible to automatically and continuously refine these models to uncover additional, otherwise impossible to identify pockets of claims that have a 98 percent or higher likelihood of being denied—and that have significant impact on AR, operational efficiency, and overall financial performance.

A simple case example can provide insight into how best to identify such pockets of opportunity.

Background: The denials analysis performed for a hospital system with a denial rate of about 16 percent incorporated the insurance code (i.e., the payer), patient class (e.g., inpatient, outpatient, emergency department visit, etc.), and other claim, payer, and potentially relevant data points.

Sample finding. The algorithms were able to establish the following conditional logic, summarized in the simple rule form:

If Primary Insurance Code = 'Medicare Part B outpatient'

And Total Lab Charges < $700

And Primary ICD-9 Procedure Code = '94.94: Other Counseling'

Then likelihood of denial = 99%

Over the set of more than 500,000 historical claims, this rule identified 780 claims that had a 99 percent probability of being denied. Moving forward, the hospital system could automatically flag claims exhibiting these traits for review before they were submitted to the payer, so that a coder can investigate the ICD-9 procedure coding to determine whether a more applicable description could be added instead of code "94.94: Other Counseling." Of course, this is but one example of the impactful, actionable pockets of denials the algorithms identified across the 500,000 historical claims.

The application of predictive modeling to estimate the likelihood of denials has the potential to identify thousands of such pockets representing both high and low denial rates. Organizations can benefit from using predictive modeling regardless of whether they already have a program in place to monitor denials by payer or department, because this approach can support program efforts to detect correlations at many different levels, including code, claim, charge, patient, and provider levels.

Having access to data sets with high levels of integrity, richness, and granularity is of paramount importance to effective predictive modeling. Organizations that comprehensively aggregate clinical and financial data to realize these capabilities—and that have clear processes in place to ensure the consistency and integrity of these data—will find correlations across a wider data-set that will inform their financial and operational decisions regarding staffing, training, service lines, and payment contracts.

Dr. Paul Bradley is ZirMed's chief data scientist.

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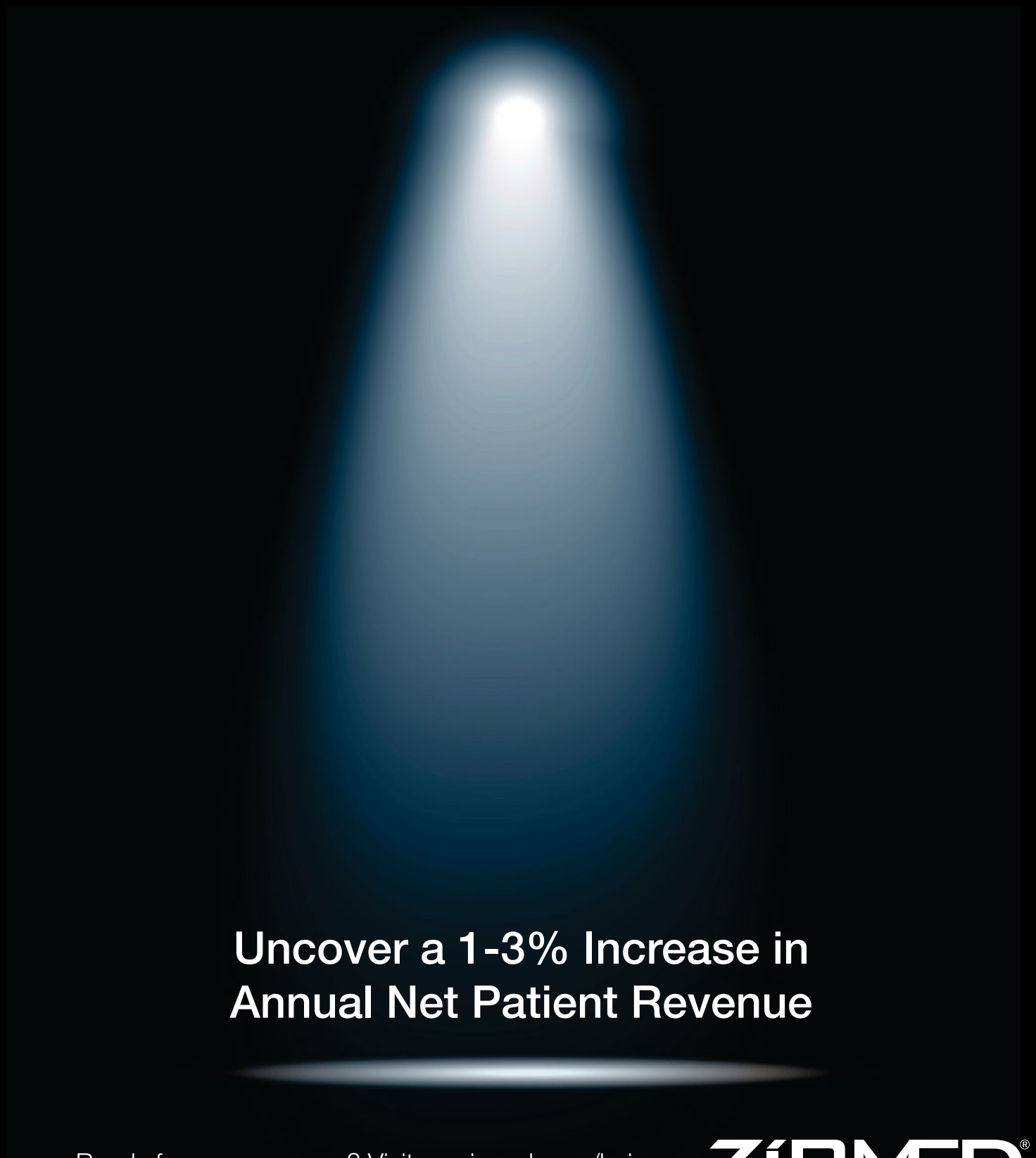

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48 '15 45 '14

CPSI | Mobile, AL | 800-711-2774 | www.cpsi.com

HIT Revenue: $204,000,000 (14) **$200,869,332 (13)** **$183,553,036 (12)**
Major Revenue: 24.5% Software, 4.7% Hardware, 70.8% Services

49 '15 n/a '14

Spok, Inc. (formerly Amcom Software, Inc.) | Springfield, VA | 800-611-8488 | www.spok.com

HIT Revenue: $200,273,000 (14) **$137,959,000 (13)** **$134,273,000 (12)**

50 '15 46 '14

MEDHOST, Inc. | Franklin, TN | 615-761-1000 | www.medhost.com

HIT Revenue: $195,300,000 (14) **$185,900,000 (13)** **$133,200,000 (12)**
Major Revenue: 45% Software, 5% Hardware, 50% Services

51 '15 50 '14

Availity* | Jacksonville, FL | 904-538-5422 | www.availity.com

HIT Revenue: $185,000,000 (14) **$154,000,000 (13)** **$133,700,000 (12)**
Major Revenue: 50% Software, 25% Hardware, and 25% Services
*Industry analysts' estimates.

52 '15 49 '14

Netsmart | Overland Park, KS | 800-472-5509 | www.ntst.com

HIT Revenue: $185,000,000 (14) **$156,400,000 (13)** **$136,000,000 (12)**

53 '15 56 '14

HealthStream | Nashville, TN | 615-301-3100 | www.healthstream.com

HIT Revenue: $171,000,000 (14) **$132,000,000 (13)** **$104,000,000 (12)**
Major Revenue: 98% Software, 2% Services

54 '15 47 '14

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

HIT Revenue: $170,000,000 (14) **$169,050,000 (13)** **$161,000,000 (12)**
Major Revenue: 100% Services
*Industry analysts' estimates.

55 '15 48 '14

CareTech Solutions* | Troy, MI | 877-700-8324 | www.caretech.com

HIT Revenue: $163,420,581 (14) **$162,607,543 (13)** **$160,000,000 (12)**
Major Revenue: 13% Software, 84% Sevices, 3% Hardware
*Industry analysts' estimates.

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56 '15 / 52 '14

SCC Soft Computer* | Clearwater, FL | 800-763-8352 | www.softcomputer.com

HIT Revenue: $155,000,000 (14) **$147,000,000 (13)** **$115,647,911 (12)**
Major Revenue: 50% Software, 30% Services, 20% Hardware
*Industry analysts' estimates.

57 '15 / 57 '14

Dimension Data (Formerly Nexus Connected) | New York, NY | 877-286-3987 | www.nexusconnectedhealthcare.com

HIT Revenue: $153,000,000 (14) **$130,000,000 (13)** **$100,000,000 (12)**
Major Revenue: 30% Software, 40% Hardware, 30% Services

58 '15 / 52 '14

Elsevier* | Philadelphia, PA | 215-239-3900 | www.elsevier.com

HIT Revenue: $151,410,000 (14) **$147,000,000 (13)** **$147,000,000 (12)**
Major Revenue: 95% Software, 5% Services
*Industry analysts' estimates.

59 '15 / 59 '14

Lexmark Healthcare* | Lenexa, KS | 913-227-7000 | www.lexmark.com/healthcare

HIT Revenue: $150,000,000 (14) **$125,000,000 (13)**
Major Revenue: 42% Software, 3% Hardware, 55% Services

60 '15 / 54 '14

Syntel | Troy, MI | 248-619-2800 | www.syntelinc.com

HIT Revenue: $147,423,742 (14) **$138,577,283 (13)** **$126,863,912 (12)**
Major Revenue: 100% Services

61 '15 / 65 '14

Mediware | Lenexa, KS | 888-633-4927 | www.mediware.com

HIT Revenue: $125,441,000 (14) **$95,000,000 (13)** **$64,601,000 (12)**
Major Revenue: 49% Software, 2% Hardware, 49% Services

62 '15 / n/a '14

Sutherland Healthcare Solutions | Clifton, NJ | 973-405-5002 | www.SutherlandHealthcare.com

HIT Revenue: $125,000,000 (14) **$111,000,000 (13)** **$115,000,000 (12)**
Major Revenue: 20% Software, 80% Services

63 '15 67 '14

Orion Health | Boston, MA | 857-488-4740 | www.orionhealth.com

HIT Revenue: $123,000,000 (14) **$135,000,000 (13)** **$93,500,000 (12)**
Major Revenue: 45% Software, 55% Services

64 '15 66 '14

Hyland | Westlake, Ohio | 888-495-2638 | www.onbase.com

HIT Revenue: $117,133,533 (14) **$93,903,699 (13)** **$95,755,858 (12)**
Major Revenue: 35% Software, 65% Services

65 '15 58 '14

IOD Incorporated* | Green Bay, WI | 920-236-3355 | www.iodincorporated.com

HIT Revenue: $115,000,000 (14) **$126,600,000 (13)** **$93,805,389 (12)**
Major Revenue: .05% Software, .10% Hardware, 99.85% Services
*Industry analysts' estimates.

66 '15 62 '14

NEC Corporation of America* | Irving, TX | 214-262-2000 | www.necam.com/Solutions/Healthcare

HIT Revenue: $110,000,000 (14) **$110,000,000 (13)** **$110,000,000 (12)**
Major Revenue: 20% Software, 50% Services, 30% Hardware
*Industry analysts' estimates.

67 '15 71 '14

ZirMed | Louisville, KY | 502-779-4302 | www.zirmed.com

HIT Revenue: $108,500,000 (14) **$87,000,000 (13)** **$76,000,000 (12)**
Major Revenue: 100% Software

68 '15 74 '14

Nordic Consulting Partners | Madison, WI | 608-268-6900 | nordicwi.com

HIT Revenue: $107,900,000 (14) **$81,400,000 (13)** **$37,800,000 (12)**
Major Revenue: 100% Services

69 '15 n/a '14

Aesynt (owned by Francisco Partners)* | Cranberry Township, PA | 800-594-9145 | aesynt.com

HIT Revenue: $100,200,000 (14)
*Industry analysts' estimates.

70 '15 ? '14

Evolent Health | Arlington, VA

HIT Revenue: $100,000,000 (14)

71 '15 / 85 '14

Imprivata | Lexington, MA | 781-430-2812 | www.imprivata.com

HIT Revenue: $97,000,000 (14) **$71,100,000 (13)** **$54,000,000 (12)**

72 '15 / 68 '14

Encore Health Resources* | Houston, TX | 877-787-1010 | www.EncoreHealthResources.com

HIT Revenue: $96,642,000 (14) **$92,040,000 (13)** **$89,770,000 (12)**
Major Revenue: 3% Software, 97% Services
*Industry analysts' estimates.

73 '15 / 76 '14

Brightree | Lawrenceville, GA | 678-243-1800 | www.brightree.com

HIT Revenue: $96,600,000 (14) **$74,900,000 (13)** **$58,800,000 (12)**
Major Revenue: 93% Software, 7% Services

74 '15 / 77 '14

Healthland | Minneapolis, MN | 612-787-3120 | www.healthland.com

HIT Revenue: $96,000,000 (14) **$89,844,000 (13)** **$32,000,000 (12)**
Major Revenue: 63% Software, 5% Hardware, 32% Services

75 '15 / 63 '14

Vocera Communications, Inc. | San Jose, CA | 408-882-5100 | www.vocera.com

HIT Revenue: $95,400,000 (14) **$102,500,000 (13)** **$101,000,000 (12)**
Major Revenue: 47% Services, 39% Hardware, 14% Software

76 '15 / 61 '14

CTG | Buffalo, NY | 716-882-8000 | www.ctg.com/industries/healthcare

HIT Revenue: $92,015,596 (14) **$110,128,788 (13)** **$121,044,438 (12)**
Major Revenue: 100% Services

77 '15 / 70 '14

Perficient, Inc | Saint Louis, MO | 314-995-8800 | www.perficient.com

HIT Revenue: $90,800,000 (14) **$81,659,400 (13)** **$75,476,750 (12)**
Major Revenue: 100% Services

78 '15 / 72 '14

MedeAnalytics, Inc.* | Emeryville, CA | 510-379-3300 | www.medeanalytics.com

HIT Revenue: $88,000,000 (14) **$84,000,000 (13)** **$73,000,000 (12)**
Major Revenue: 90% Software; 10% Services
*Industry analysts' estimates.

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79 '15 n/a '14

Medecision | Philadelphia, PA | 610-540-0202 | www.medecision.com

HIT Revenue: $85,000,000 (14)
Major Revenue: 70% Software, 30% Services

80 '15 73 '14

Zynx Health* | Los Angeles, CA | 888-333-9969 | www.zynxhealth.com

HIT Revenue: $82,000,000 (14) **$81,585,000 (13)** **$77,700,000 (12)**
Major Revenue: >95% Hardware; <5% Services
*Industry analysts' estimates.

81 '15 n/a '14

CSI Healthcare IT | Jacksonville, FL | 800-582-0828 | www.csihealthcareIT.com

HIT Revenue: $81,697,852 (14) **$62,581,873 (13)** **$67,759,469 (12)**
Major Revenue: 100% Services

82 '15 75 '14

TeleTracking Technologies, Inc.* | Pittsburgh, PA | 412-568-6078 | www.teletracking.com

HIT Revenue: $81,544,050 (14) **$77,661,000 (13)** **$72,361,000 (12)**
Major Revenue: 70% Software, 25% Services, 5% Hardware
*Industry analysts' estimates.

83 '15 69 '14

QuadraMed Corp.* (owned by Harris Corporation) | Reston, VA | 703-709-2300 | www.QuadraMed.com

HIT Revenue: $80,000,000 (14) **$90,000,000 (13)** **$106,000,000 (12)**
Major Revenue: 70% Software, 1% Hardware, 29% Services
*Industry analysts' estimates.

84 '15 78 '14

Edifecs | Bellevue, WA | 425-435-2894 | www.edifecs.com

HIT Revenue: $77,129,243 (14) **$71,000,000 (13)** **$52,000,000 (12)**
Major Revenue: 81.62% Software, 18.38% Services

85 '15 79 '14

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

HIT Revenue: $73,767,959 (14) **$63,152,000 (13)** **$50,884,942 (12)**
Major Revenue: 98% Software, 2% Services

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86 '15 n/a '14

HealthEdge* | Burlington, MA | 781-285-1300 | http://www.healthedge.com

HIT Revenue: $73,000,000 (14)
*Industry analysts' estimates.

87 '15 82 '14

Brocade | San Jose, CA | 408-333-4300 | www.brocade.com

HIT Revenue: $72,000,000 (14) **$61,400,000 (13)** **$54,900,000 (12)**
Major Revenue: 5% Software, 90% Hardware, 5% Services

88 '15 n/a '14

The HCI Group | Jacksonville, FL | 904-337-6300 | www.thehcigroup.com

HIT Revenue: $69,677,796 (14) **$34,583,142 (13)** **$25,333,458 (12)**
Major Revenue: 100% Services

89 '15 64 '14

T-System | Dallas, TX | 800-667-2482 | www.tsystem.com

HIT Revenue: $68,840,000 (14) **$100,000,000 (13)** **$100,000,000 (12)**
Major Revenue: 65% Software, 35% Services

90 '15 n/a '14

Document Storage Systems, Inc. | Juno Beach, FL | 561-284-7000 | www.dssinc.com

HIT Revenue: $68,500,000 (14) **$59,300,000 (13)** **$68,400,000 (12)**
Major Revenue: 75% Software, 25% Services

91 '15 n/a '14

Burwood Group | Chicago, IL | 312-327-4600 | www.burwood.com

HIT Revenue: $67,954,499 (14) **$54,474,310 (13)** **$60,628,525 (12)**
Major Revenue: 70% Hardware, 30% Software

92 '15 n/a '14

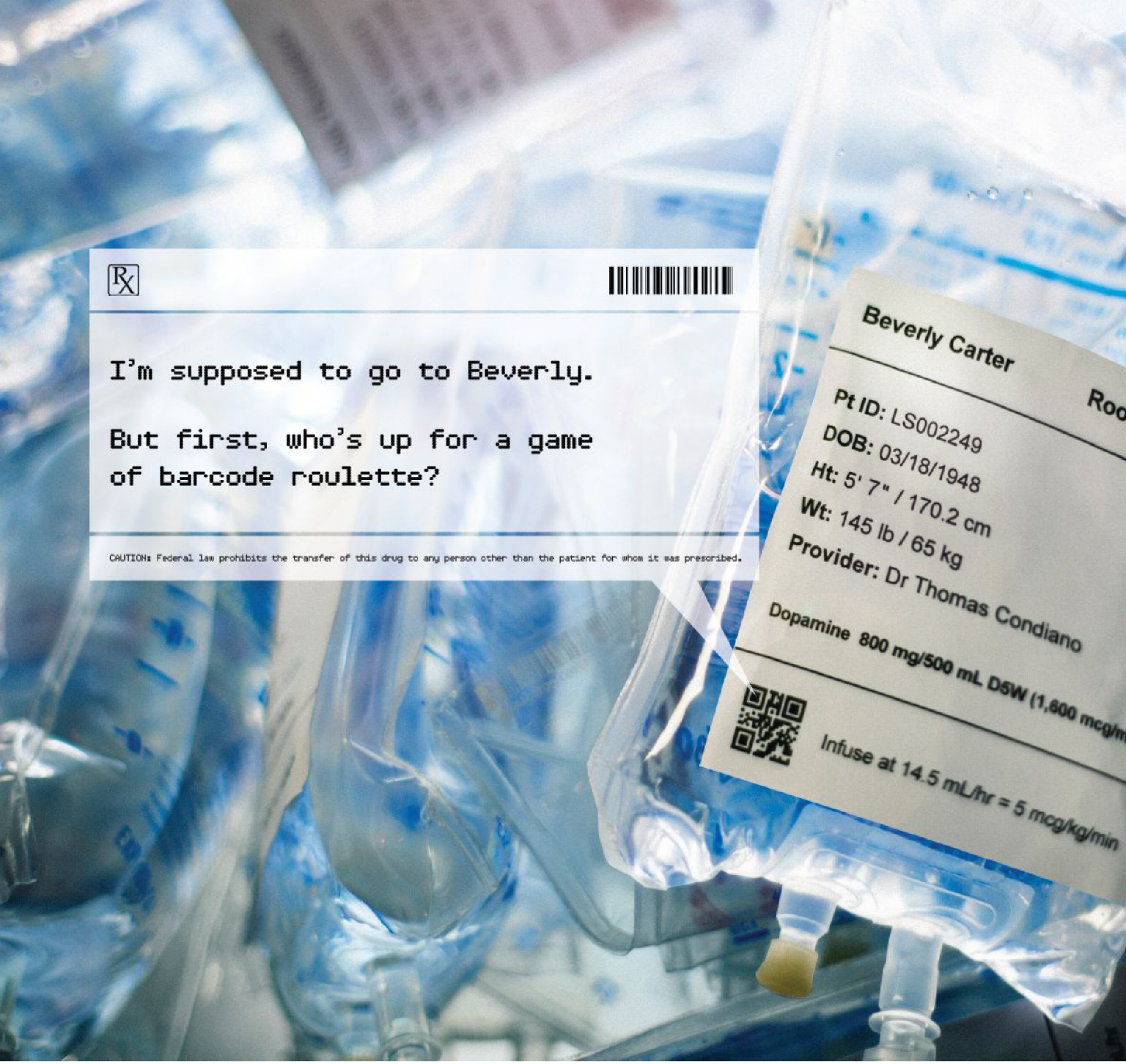
Meridian Medical Management | Winsor, CT | 855-499-9333 | www.m3meridian.com

HIT Revenue: $65,300,000 (14) **$47,900,000 (13)**
Major Revenue: 10% Software, 90% Services

93 '15 84 '14

SourceMedical (Source Medical Solutions, Inc.) | Birmingham, AL | 866-687-2300 | www.sourcemed.net

HIT Revenue: $63,300,384 (14) **$58,906,661 (13)** **$56,247,857 (12)**
Major Revenue: 6.5% Software, .07% Hardware, 93.43% Services



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94 '15 n/a '14

Sharecare * | Atlanta, GA | 404-671-4000 | www.sharecare.com

HIT Revenue: $63,000,000 (14)
Major Revenue: 100% software
*Industry analysts' estimates.

95 '15 83 '14

The SSI Group* | Mobile, AL | 251-345-0000 | www.thessigroup.com

HIT Revenue: $62,291,250 (14) **$59,325,000 (13)** **$56,500,000 (12)**
Major Revenue: 100% Software
*Industry analysts' estimates.

96 '15 n/a '14

KPMG LLP (formerly Beacon Partners)* | Weymouth, MA | 201-307-7000 | www.kpmg.com

HIT Revenue: $62,000,000 (14) **$61,767,701 (13)** **$62,971,275 (12)**
Major Revenue: 100% Services
*Industry analysts' estimates.

97 '15 86 '14

Capsule Tech, Inc.* | Andover, MA | 978-482-2300 | www.capsuletech.com

HIT Revenue: $61,376,000 (14) **$54,800,000 (13)** **$44,300,000 (12)**
Major Revenue: 35% Software, 27% Services, 28% Hardware, 10% Unaccounted
*Industry analysts' estimates.

98 '15 n/a '14

EPAM Systems Inc. | Newtown, PA | 267-759-9000 | www.epam.com

HIT Revenue: $61,187,844 (14)
Major Revenue: 100% Services

99 '15 n/a '14

Caradigm* | Bellevue, WA | 425-201-2500 | www.caradigm.com

HIT Revenue: $60,000,000 (14)
*Industry analysts' estimates.

100 '15 89 '14

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

HIT Revenue: $55,230,000 (14) **$52,600,000 (13)** **$45,922,000 (12)**
Major Revenue: 23% Software, 77% Services
*Industry analysts' estimates.

Most Interesting Vendors: Cerner's $1.3 Billion Bet

By acquiring Siemens' health IT division for $1.3 billion, Cerner is moving down an interesting, blended path

BY GABRIEL PERNA

On Aug. 5, 2014, the healthcare IT world was stood on its head when Cerner bought the health IT division of Siemens for $1.3 billion.

Cerner's buy was one of the largest acquisitions in the history of the industry. For some, it was a clear signal that the vendor wouldn't go quietly into the night and let a certain rival dominate the industry unopposed. But while rumors circulated that Cerner was making a defensive play against Epic, the company's executives denied that motive outright.

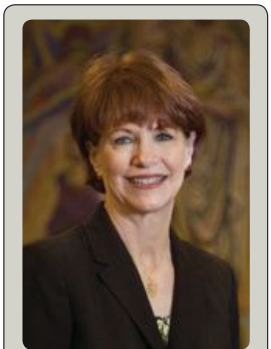
"Cerner is doing incredibly well today. We didn't need to make an acquisition, nor were we even looking for one," Zane Burke, Cerner President, told *HCI* at the time. Another higher-up, former Siemens CEO and current senior vice president at Siemens, John Glaser, Ph.D., said the same thing in a separate interview with *HCI*, stating that "It's not a competitive response, it's an industry response."

Rather, Burke says in a recent interview, the move came about because Cerner felt Siemens' entire product lineup, specifically its revenue cycle software, would strengthen its overall offering. Siemens approached Cerner first he notes, and after careful consideration and analysis, the latter determined the acquisition wouldn't disrupt any momentum Cerner had already accumulated.

Regardless of the motive, the move made sense to Beth Anderson, hospital administrator at the University of South Alabama Health System, which was a Siemens customer at the time of the acquisition. "We thought it was a good move for us. We have a proactive CIO who started making calls to fellow institutions that had Cerner. We were getting positive comments back," Anderson says.

The move has had major ramifications. There is the obvious: it made Cerner the second highest revenue-earning company in healthcare IT last year and the market share leader for acute-care hospitals. More so, it has sent Cerner down an interesting path to blend and support differing systems—a path that has been somewhat rocky for a few of its rivals. For this reason, Cerner is one of Healthcare Informatics' Most Interesting Vendors for an unprecedented second straight year.

Zane Burke



Beth Anderson

"FOR SOME, [THE SIEMENS ACQUISITION] WAS A CLEAR SIGNAL THAT THE VENDOR WOULDN'T GO QUIETLY INTO THE NIGHT AND LET A CERTAIN RIVAL DOMINATE THE INDUSTRY UNOPPOSED."

POST-ACQUISITION

The deal bringing together Cerner and Siemens' health IT division officially closed on the second of February. It was on that day, says Burke, that more than 5,000 former Siemens associates joined Cerner. Since then, Cerner has worked to transition as many elements of Siemens' health IT division as possible, including call centers, support services, billing, and various other departments. Naturally, as Dick Flanigan, president of Cerner HS, notes, "Siemens was a large company with hundreds and hundreds of operations…not everything could transition on day one."

Along with transitioning employees, Cerner reached out to the clients as well during the first few months of the marriage. Through these meet-

ings, Burke says the company has gotten a chance to introduce themselves.

"It's interesting because you think that everyone knows who you are, and that's not from a lack of humility, it's just you think people know about Cerner. What's been great is that while that's generally been the case, we had an opportunity to introduce ourselves," Flanigan says. Burke adds that conversations have been reciprocal, with Cerner hearing the specific client's journeys and where they want to go. "Some are thinking about integrated ambulatory and rev cycle (products) and those clients have been very receptive to us," he says.


Dick Flanagan

While many may have assumed, and still may assume, Cerner would push Siemens' Soarian clients towards its Millennium platform, Flanigan says that won't be the case. He says they will advance and support Sorian for ten years. "It's a clear message to the client base that you don't have to make a quick decision," he says. Other product lineups, such as MedSeries, will be supported but not advanced. He does say that clients looking for an "end-to-end platform," would be likely migrated towards Millennium.

UNIVERSITY OF SOUTH ALABAMA

For University of South Alabama (USA) Health System, a Sorian customer for the last four or five years, the move to Millennium was a bit of a no brainer. The organization had a conglomeration of different IT systems and a desire to become more integrated with the shift towards value-based care accelerating in Alabama. "Siemens didn't have a lot of solutions. They were partnering with a lot of people which meant a lot of interfacing," says Anderson.

Thus, the Cerner acquisition came along at a good time. After doing the aforementioned prospective research, Mark Lauteren, CIO at USA Health System, reached out to Cerner and was subsequently invited to Kansas City for a user meeting. Anderson, who attended the meeting, was blown away by Cerner's integration offerings. Once they saw it first hand, they calculated the financials and realized it made sense to migrate.

Continued on page 42

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HCI 100

Our Annual Ranking of Healthcare IT Vendors

The editors of *Healthcare Informatics* are proud to present the newest edition of our 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.

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- Higher revenues all around
- Risers and fallers

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HCI100

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2015 HCI 100

Rank	Previous Rank	Company	Revenue ($US)	Location
1	12	Optum	5,227,000,000	Eden Prairie, MN
2	2	Cerner Corp.	3,400,000,000	Kansas City, MO
3	1	McKesson	3,120,000,000	Alpharetta, GA
4	3	Dell	2,900,000,000	Round Rock, TX
5	6	Cognizant	2,700,000,000	Teaneck, NJ
6	4	Philips	2,677,000,000	Andover, MA
7		Xerox	2,350,342,656	Norwalk, CT
8	7	Siemens*	1,991,000,000	Malvern, PA
9	8	Epic Systems Corp.*	1,800,000,000	Verona, WI
10	9	GE Healthcare*	1,500,000,000	Chalfont St. Giles, U.K.
11	10	Allscripts	1,377,873,000	Chicago, Il
12	11	Emdeon, Inc.	1,350,413,000	Nashville, TN
13	13	CSC	1,299,800,000	Falls Church, VA
14		Conifer Health Solutions	1,200,000,000	Frisco, TX
15	18	Leidos Health	980,100,000	Reston, VA
16	15	Nuance Communications	942,700,000	Burlington, MA
17	14	EMC*	925,000,000	Hopkinton, MA
		Infosys	828,030,000	Rockville, MD
		athenahealth	752,599,000	Watertown, MA
		Wolters Kluwer Health	748,000,000	Philadelphia, PA
		3M Health Information Systems	689,000,000	Salt Lake City, Utah
		Wipro Technologies	682,746,580	East Brunswick,NJ
		The Advisory Board Company	574,229,000	Washington, D.C.
		Oracle **		Redwood Shores, CA
		IBM **		Armonk, NY
		Truven Health Analytics	544,475,000	Ann Arbor, MI
		Medical Information Technology, Inc. (MEDITECH)	517,002,274	Westwood, MA
		Quality Systems Inc. (NextGen)	444,667,000	Irvine, CA
29		Omnicell	441,000,000	Mountain View, CA
30	30	NetApp*	438,350,000	Sunnyvale, CA
31	17	MedAssets, Inc.	428,866,000	Alpharetta, GA
32	33	InterSystems +	391,200,000	Cambridge, MA
33	31	Northrop Grumman Corp.*	382,000,000	Falls Church, VA

HCI 100 Enhanced Listings:

DSS EHR-INNOVATION | encore A Quintiles Company | Evident | Experian Health | PASSPORT A part of Experian

InterSystems | Lexmark Healthcare | MERIDIAN MEDICAL MANAGEMENT | OPTUM | ZIRMED

The HCI 100 provides a complete listing of the top 100 revenue-earning companies in the industry. Any company that can identify its U.S.-based HIT-based revenues is eligible to submit its figures. To formulate this list, the HCI editorial staff worked with two market research and analysis companies: Porter Research (Atlanta) and ST Advisors, LLC (San Francisco).

View the complete HCI 100 2015 list at www.healthcare-informatics.com/hci100

HCI HEALTHCARE INFORMATICS

Most Interesting Vendor: At IBM, Providing Insights Beyond Human Cognition

Advanced analytics added with IBM Watson's cognitive capabilities is once again keeping IBM ahead of the game when it comes to healthcare technology

BY RAJIV LEVENTHAL

The general public might look at the Armonk, N.Y.-based International Business Machines Corporation, universally known as IBM, and still think of the multinational organization as a computer hardware and software company only. However, few areas of health and medicine have gone untouched by the technology, research and innovation generated by IBM in recent decades.

Having originated more than 100 years ago, the company has continuously evolved since its inception. Over the last several years specifically, IBM has been focused on helping its provider organization clients in their objectives to serve their populations, and be more patient-centered and outcome-oriented in the work they do, says Sean Hogan, vice president and general manager of healthcare at IBM. "Now that we have had dramatic acceleration and adoption of electronic medical record (EMR) systems and other sources of information, how do we help organizations take advantage of that as an asset to better perform?" Hogan says, noting that IBM "doesn't define itself as a product company, but one that innovates around solving problems."


Sean Hogan

At the core of that, he adds, is doing analytics work for organizations, helping them get access to data and get confidence in their data, as well as completeness of it. The organization's data analytics software already figures in prominent medical research trials with the Cleveland Clinic, Mayo Clinic, and the Memorial Sloan Kettering Cancer Center. "If you're not confident about the quality and completeness of information, it's difficult to get teams to execute against that. Helping organizations manage their information is a major driver for how they're serving populations," Hogan says.

"TO BE ABLE TO ACCESS MEDICAL KNOWLEDGE AND JOURNALS AND LITERATURE, COMBINE THAT WITH DATA SPECIFIC TO A PERSON, AND THEN APPLY ALL OF THE AVAILABLE MEDICAL KNOWLEDGE AGAINST WHAT'S KNOWN ABOUT SOMEONE AND THEIR CONDITION—THAT COULD EVOLVE KNOWLEDGE." *--SEAN HOGAN*

Another big part of IBM's mission, Hogan says, is helping organizations take advantage of its migrate-to-cloud-based services. As such, the company made two major moves in April at the Healthcare Information and Management Systems Society (HIMSS) conference in Chicago, announcing the acquisition of the Cleveland-based Explorys, a healthcare intelligence cloud firm, and Dallas-based population health management company Phytel. Regarding the Explorys acquisition, IBM officials noted that, "Since its spin-off from the Cleveland Clinic in 2009, Explorys has secured a robust healthcare database derived from numerous and diverse financial, operational and medical record systems comprising 315 billion longitudinal data points across the continuum of care."

According to Anil Jain, M.D., chief medical officer (CMO) for Explorys, and practicing physician at the Cleveland Clinic, there is "clear synergy" among the two companies, IBM and

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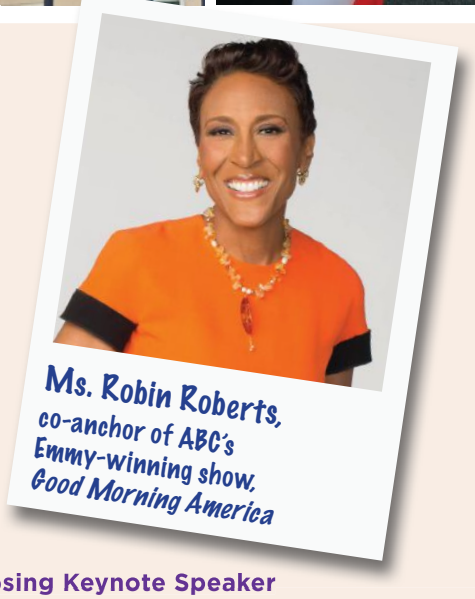

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Explorys. "Over the years we [Explorys] have become leaders when it comes to aggregating data from all the different disparate data sources that exist in a health system, and bringing it together to solve real-world problems in a very rapid manner using population health as a use case that is near and dear to most clinical systems right now," Dr. Jain says. "In many ways it's very much a competitive advantage to get a handle on all that data and do actionable things." Jain says that what attracted IBM was Explorys' ability to help them accelerate, from a data point of view—with its 50 million lives and 360 hospitals—but also from an analytics perspective.

THE ERA OF COGNITIVE COMPUTING

Enter the Watson Health Cloud, which IBM will sell to doctors, hospitals, insurers and patients. That offering will be the centerpiece of a new dedicated, Boston-area business unit, IBM Watson Health, which now includes both Explorys and Phytel. "[IBM] is complimenting much of what we do around traditional analytics using machine learning algorithms with some of the cognitive computing and the Watson analytics that Watson Health group will be leveraging," Jain says. "We became the content that will fuel some of the next generation analytics that Watson has become famous for."

Indeed, Watson, the Jeopardy!-playing supercomputer, is built to mirror the human learning process through the power of cognition. According to Rob Merkel, vice president of the Watson Health unit, the creation of this group "is a signal to the market that we are making significant advancements in the market to accelerate this technology." At the time of the April announcement, Merkel says, it was about three years since the Jeopardy! demonstration. In that time span, the Watson team went from 26 researchers to 150 to ending last year with 2,000, he notes. "At the end of the day, we're trying to provide insights that are beyond human cognition," Merkel says.

Robert Merkel

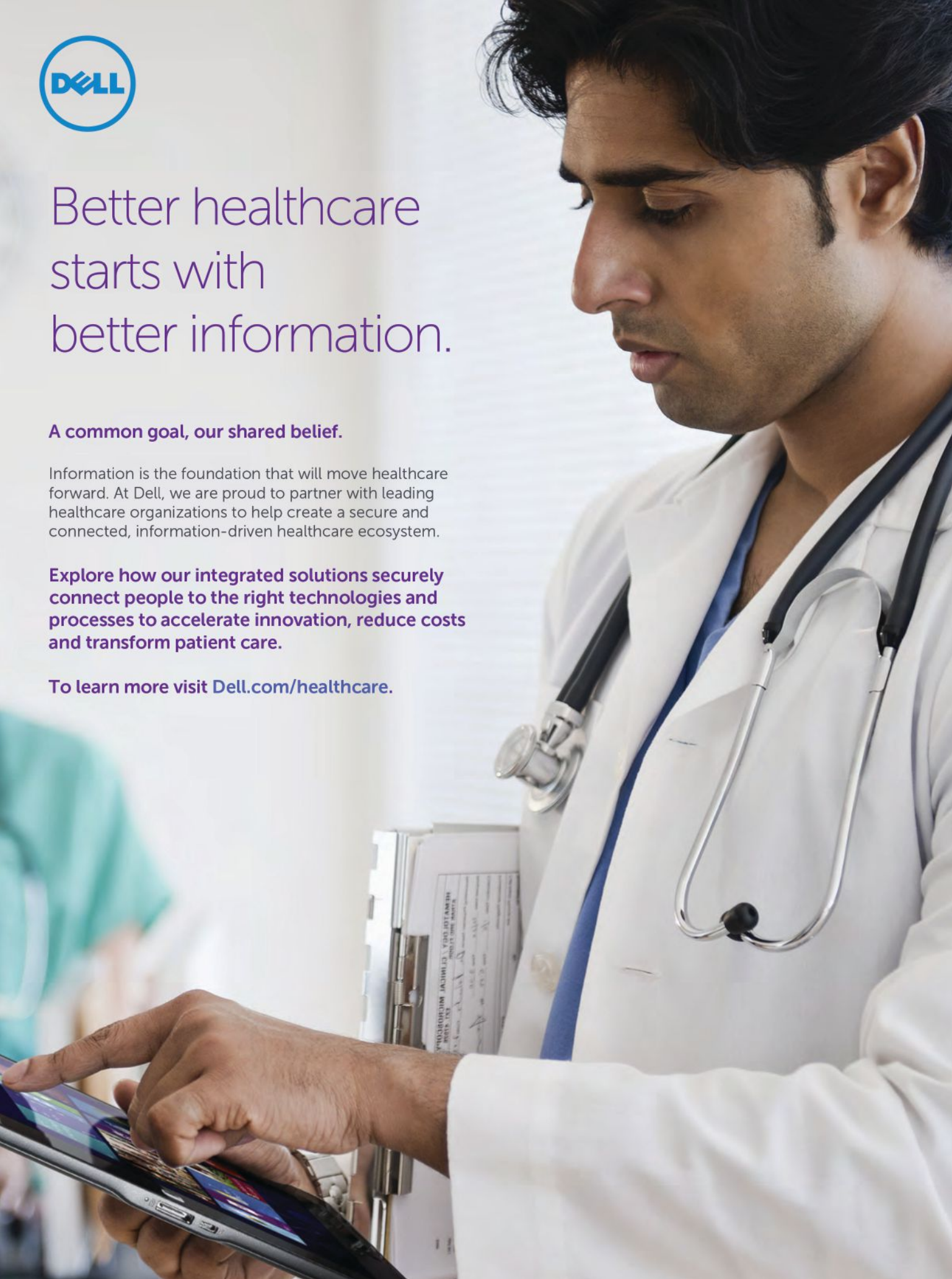
Anil Jain, M.D.

Merkel says that the organization has been trying to accomplish this coming from two different directions—published knowledge and data-driven insights. Within healthcare, there's a few data points that just make it clear what's beyond cognition, he says. "I see all of these stats on the proliferation of medical literature, from it doubling every five years to every three years, and sometimes studies even say it will just takes days for medical literature to double," he says. "There are 700,000 research articles and 180,000 clinical trials per year. Even if all you did was read, you wouldn't be able to scratch the surface in many lifetimes. So that's the knowledge approach—providing insights off those large knowledge repositories," Merkel says.

The other side is data-driven insights—what is the information you can find out about an individual? According to Merkel, IBM research estimates that over the course of a lifetime, one person will generate about 400 gigabytes worth of information, a number that increases to 6 terabytes of information when genomics are factored in. Factoring in exogenous behavioral type data such as Fitbit information it goes to 1,100 terabytes, or as Merkel says, "11,000 top-of-the-line smartphones worth of information." He adds, "There is just so much information to analyze, both knowledge-driven and data-driven. That's where we're coming from when we announce Watson health and the formation of the industry cloud that we will create to put in a standards-based, compliant, massively scalable information base to provide these insights off of," he says.

To this end, Watson applications in healthcare are organized across three dimensions, Merkel says: consumer engagement, R&D related productivity solutions, and improving clinical outcomes. In the first category, consumer engagement, is IBM's Engagement Advisor solution, which is what most people think of when they think of Jeopardy! demonstration. You ask a difficult question, you get a very good answer, Merkel notes. "Now it has advanced four years where you can have dialogue with Watson, and it remembers the context in which you're having this dialogue," he says. "We have done a lot of work around wellness solutions and chronic condition management solutions where a person can ask questions about his or her condition and have Watson give thoughtful answers," he says.

In R&D transformation, the company's Discovery Advisor solution is geared towards research in which hypotheses are generated and tested from Watson reading through 40 million research documents related to healthcare and life sciences. For example, says Merkel, at the Baylor College of Medicine, researchers were interested in phosphorylation, the p53 protein that stops the formation of tumors. There are some 70,000 studies in *Medline* alone on this single protein, Merkel says. "Now imagine Watson doing this for you as you're trying to identify new targets for research. The entire run rate for the industry over the past 10 to 20 years has



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been approximately one [new target] per year. In weeks of using Watson, they identified seven which were peer reviewed and published," Merkel says. Another IBM solution used in oncology allows Watson to receive information on a tumor which it then explores all known literature about, Merkel says. "Imagine [Watson] creates a complete biochemical picture of the tumor, which would take months worth of effort of highly-skilled people. Now imagine Watson could do that in five minutes. That's what's being beta tested today with this solution," Merkel says.

In terms of clinical outcomes, Merkel points to a solution that IBM developed with Sloan Kettering which allows Watson to provide treatment recommendations, starting with chemotherapy but eventually expanding into other areas of oncology. Then there is its EMR Advisor, in which Watson reads through a complete patient longitudinal history where it can then assist a physician in understanding what's going on in a patient's history. As a novel example, Merkel notes, Watson dynamically generates the problem list based on reading through the clinician's notes. "Imagine Watson creates a problem list based on what it sees in the medical record, something that physicians and nurses don't have a lot of time to maintain, so it's not often the most accurate. Side-by-side it has performed very well against humans," he says.

Also in the EMR arena, IBM and the Verona, Wis.-based Epic Systems are collaborating with Mayo Clinic to bring EMRs together with the cognitive computing capabilities of Watson. They are working on a proof of concept focused on helping match patients to the most relevant clinical trials for their individual conditions. Epic is extracting patient data from health records, delivering it to Watson to be quickly compared with massive volumes of relevant clinical data, and then sending results back into the Epic EMR. For patients, this potentially means more rapid and thorough analysis of all the factors that could impact their care drawing from insights far beyond the information contained in medical records alone, say IBM officials.

All of this moving and shaking, according to Hogan and Merkel, presents an opportunity to embark into the "third era of computing." First, says Merkel, is tabulating systems; second is programmable systems, and "now we are in the era of cognitive computing. We think this will last for decades and this information revolution will be enormous," he says. Hogan agrees with the notion that healthcare is such an information-intensive industry, noting that it will require a major shift in terms of being able to unlock a better understanding of approaches to handling medical conditions and health statuses. "We have the ability to do advanced analytics to see patterns and surface outliers, added with the cognitive capability that brings forward context," Hogan says. "So to be able to access medical knowledge and journals and literature, combine that with data specific to a person, and then apply all of the available medical knowledge against what's known about someone and their condition—that could evolve knowledge," he says.

AD INDEX

Most Interesting Vendors: Cognizant: Making the IT Services-Software Connection in the New Managed Care

The opportunity to leap fully into the accountable care space was irresistible to this rapidly growing managed care services company

BY MARK HAGLAND

It's not as though no one was paying attention to the Teaneck, N.J.-based Cognizant before September 2014. After all, the company had already been making waves as a provider of IT services across many industries, with an already-significant presence in the health insurance world.

Still, the announcement that Cognizant (number 5 on the *Healthcare Informatics* 100 list, with $2,689,427,000 in U.S. healthcare revenues in 2014), was acquiring the Englewood, Colo.-based TriZetto for $2.7 billion in cash was seen as some in the industry as a harbinger of things to come, as the concepts of managed care, population health, and accountable care, begin to blend together, with health insurers and providers collaborating to manage patient's care, and as providers take on more financial risk, in the broad effort to improve outcomes and cut costs in U.S. healthcare.

As a report in *Bloomberg Business* put it on Sep. 15, the day the news broke, "Cognizant, one of the largest providers of outsourcing services, is tackling its biggest-ever acquisition to bulk up in information technology that helps providers streamline processes, improve the cost and quality of care and cope with an industry overhaul. The takeover follows Cognizant's 11 percent share decline this year, driven largely by the company reducing its annual revenue forecast in August because of tech-service deals taking longer to close."


Ben Rooks


Krish Venkat

Meanwhile, in a Sep. 17, 2014 analysis of the acquisition announcement entitled "How Cognizant's TriZetto Deal Could Trigger the Next Wave of Consolidation in the IT Services Industry," Harichandan Arakali wrote in the *International Business Times* online, "There is an accelerating shift in customer expectations: they want vendors to move from merely deploying software packages and maintaining them to implementing technology solutions that solve real business problems and provide additional value, such as insights that can drive new revenue streams."

In addition, Arakali wrote, "TriZetto's cloud-based software-as-a-service platform for hospitals accounts for about 20 percent of its revenues, Cognizant's president Gordon Coburn told analysts on a call on Sep. 15, after the deal was announced. Further, including software licenses for packages used by insurers, about 60 percent of TriZetto's sales represents recurring revenue, he said." What's more, Arakali wrote, "Cognizant is setting the pace in acquiring the intellectual property in terms of software around which its 190,000-strong services team can go where Indian outsourcing services providers have never gone before."

Krish Venkat, president, Global Healthcare & Life Sciences, at Cognizant, says the acquisition of TriZetto fits in perfectly with the company's broader trajectory. "What Cognizant is trying to do is obviously synchronize to where we believe the industry is heading, and where the various participants in the healthcare ecosystem are making their moves," he says. "When you look

at changes in the Affordable Care Act, they're forcing many changes: the lines are blurring between payers and providers; a lot of consolidation is occurring; a lot of providers are taking on more risk to fully become health systems; and there's a lot of consolidation on the payer side as well."

Venkat says that while Cognizant was already all in, in terms of the provision of IT services for health insurers, "One of the things we didn't have in our repertoire, as late as last year—one aspect we see emerging, and we didn't have the full suite of product offerings—when we look at large and small customers and those in between, we look at the challenges we have in terms of what is imposed on them under the ACA [Affordable Care Act], in terms of the administrative costs and medical loss ratios. And many health plans are operating with dated technologies—and they have a smaller footprint, and want to have the support of somebody with a much larger challenge." In other words, he believes that many health insurers, in order to expand their capabilities in their markets, will need the kinds of enabling services that the combined Cognizant/TriZetto can offer.

OBSERVERS SEE OPPORTUNITIES

Industry observers see Cognizant's trajectory, post-TriZetto-acquisition, as one offers great opportunity for the company—along with certain specific challenges. Ben Rooks, an industry analyst and observer who heads up the ST Advisors consulting firm based in Northern California, and who in the past provided consulting expertise to Cognizant executives, says, "Cognizant has a great asset in that they are providing services to probably nine out of the top ten payers. Traditionally, the services were outsourcing services." After a series of complicated business moves, TriZetto acquired a very important asset, a core claims processing system that helped turn the company into a "powerhouse," as he puts it. What's more, he says, "Cognizant and TriZetto were both originally spun out of Dun & Bradstreet, so by acquiring TriZetto, they basically reintegrated things. It was a very smart move; and now they're one of the very dominant payer services companies. They've got services and they've got product; they're positioned to be one of the top players in the space."

"[M]ANY HEALTH PLANS ARE OPERATING WITH DATED TECHNOLOGIES—AND THEY HAVE A SMALLER FOOTPRINT, AND WANT TO HAVE THE SUPPORT OF SOMEBODY WITH A MUCH LARGER CHALLENGE."

–KRISH VENKAT, PRESIDENT, GLOBAL HEALTHCARE & LIFE SCIENCES, COGNIZANT

As for challenges, Rooks says that "I think for a predominantly IT sourcing services business, to acquire a more traditional software business is always challenging. So I think the biggest challenge is for an IT outsourcing organization acquiring a software company, the cultures are different, the business styles are different and the margin profiles are different. That probably drives a lot of it."

Still, he adds, "The biggest opportunity is that they really can provide a 360-degree solution to their health plan customers. And the nature of a health plan is becoming more blurry. Deb Gates, the CEO of MEDecision, talks about 'pay-viders,'" Rooks says. "So, say that I'm a multispecialty medical group taking on $150 million in risk contracts, am I a payer or a provider? So the 'payer' market really is growing, but it's also consolidating; and meanwhile, lots of hospitals and medical groups are taking on risk, which is blurring the lines."

Customer executives are both intrigued and excited by the company's trajectory. "I do think it's a very interesting company, just because of the depth of skill involved; and it's a very large company," says Lee Marley, senior vice president and CIO at the eight-hospital Presbyterian Health Services in Albuquerque (a spokesperson for Cognizant confirmed that Cognizant currently encompasses 217,000 employees worldwide). "And," she adds, "with the acquisition of TriZetto, that really does make them very interesting to watch. And any vendor with provider and plan expertise is going to be able to bring those companies together in ways that companies that don't have both of those sets of expertise won't be able to do." She describes her organization's relationship with the company as "a very long-standing, successful" one.

Going forward, Cognizant's Venkat sees two very broad areas of opportunity for the company. "One area is with provider organizations, as they take on greater risk and develop accountable care and population health initiatives," he says. "Population health is certainly one area where we've developed a solution, and we're integrating that with the TriZetto platform." The other broad area of opportunity, he says, is in what he calls "consumerism"—the broad range of health plan member engagement possibilities around "improving consumers' ability to select plans," and to better manage their interactions with health plans.

Some aspects of the population health trajectory yet remain to be fully sketched out. But it's a good bet that a company with a full range of both IT services and software capabilities, and one able to help both traditional health insurers and the newer risk-bearing provider organizations, will be well-positioned going forward into the new healthcare.

Most Interesting Vendors: eClinicalWorks: Riding a Wave of Innovation

The EHR vendor is expanding out in multiple directions, including moving to support telehealth, and considering entering the inpatient EHR market

BY DAVID RATHS

Healthcare Informatics chose ambulatory EHR company eClinicalWorks (eCW) as one of this year's most interesting vendors on the *HCI* 100 list both because of what it has accomplished over the past decade, and because of its potential for continued growth. Despite his company's impressive performance in the ambulatory market, hard-charging CEO and co-founder Girish Navani isn't satisfied. He is closely eyeing the acute-care EHR market as well.

An EHR vendor with a reputation for always being on the cutting edge of technology, the privately held eCW has grown its customer base to more than 100,000 physicians and 600,000 users. The Westborough, Mass.-based company now has 4,000 employees, and its 2014 revenue was $333 million (which placed it 39th on the 2015 *Healthcare Informatics* 100 list).

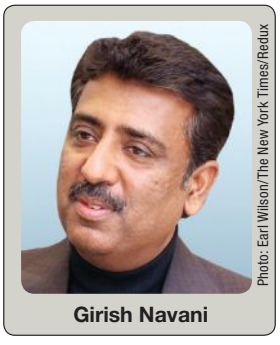
Photo: Earl Wilson/The New York Times/Redux

Girish Navani

Yet Navani admits he initially stumbled into the idea for the company about 15 years ago. After seeing a conference presentation in Geneva, Switzerland about the potential of health IT, and then talking to his primary care doctor about his office operations, he realized how little progress had been made on automation. "I compared fields like finance and semiconductors to healthcare and felt they were two different generations of technology," he says. "One had digitized itself completely, and the other was completely on paper. So it became a logical choice for someone looking to be an entrepreneur to make an impact."

In the first few years after founding the company, Navani and his co-founders spent a lot of time studying care delivery and pain points. "We brought a thinking that says don't just focus on progress notes, prescriptions and labs; think about work flow, digitizing a system that is interconnected with the supply chain of healthcare."

"WE WANTED TO… FOCUS ON GENERATING RECURRING REVENUE AND FUND OUR GROWTH THROUGH THE SUCCESS OF OUR CUSTOMERS. NOBODY THOUGHT WE COULD DO IT." *--GIRISH NAVANI*

eCW also broke from the custom at the time and chose not to take money from outside investors. "This is 1999, the dot.com era, when every Tom, Dick and Harry was raising capital to go live with a website that was going to be measured in eyeballs, not real revenues," Navani says. "We wanted to boot strap it, focus on generating recurring revenue and fund our growth through the success of our customers. Nobody thought we could do it. Even some people at the company said they don't think we were going to be successful doing this. But once we started gaining momentum, we were comfortable with slow-paced growth in the early phases."

One high-profile customer that helped put eCW on the map is the Primary Care Information Project in New York City, which Farzad Mostashari, M.D., led before he became National Coordinator for Health IT. When New York City picked eCW, it was a $26 million company, and the contract was worth almost $19 million. "It was more than a turning point," Navani says. "For that project there are more than 5,000 doctors on eCW in one geographic location," he says, "and it is done with outcomes and population health in mind, not just EHR implementation."

eCW also has a loyal following among federally qualified health centers, with

approximately 50 percent of that market.

Erik Bermudez, a KLAS research director, says eCW has a reputation among its customers for amazing innovation. "They are seen as a software development/engineering shop that can pump out more awesome, impactful technology than almost any vendor on the market," he says. "There is probably only one vendor on the technology side who is close to them as a competitor: athenahealth."

eCW is already going down the path of telehealth and has advanced tools for physician-led ACOs and patient engagement. "They have done a phenomenal job of looking at all the spaces that need to be filled from a technology standpoint, for providers today and in the next generation, and every one of those spaces has a solution," Bermudez says.

If eCW has a weakness, it is on the customer support side, he says. Customers say it is like being given a Ferrari without knowing where the gas pedal and steering wheel are. "They love the technology, but many say they don't feel that they have a business partner to ensure that they are successful," Bermudez added. "Of course, very few vendors actually have customers who refer to them as partners."

Vinaya Gavini, M.D., a physician at the ADHD Clinic for Adults & Kids. In Novi, Mich., and an eCW customer, says it's true that eCW's software has lots of bells and whistles, "but I found it to be very user friendly and within a couple of months I got the hang of it and really like it."

Gavini says he likes eCW's Healow patient portal and a Messenger care management tool that automates sending messages to all his patients about upcoming appointments. "That is an example of cutting-edge technology," he says. "No matter how much incentive I give to my staff, it was always a mundane task to call all these numbers with appointment reminders. Messenger sends them an e-mail, text message or voice mail. Our no-shows have gone down significantly."

Although Navani is the public face of the company, several of the other co-founders also still work there, and he stresses that teamwork and a unique company culture are key to the company's success.

He says eCW is very different from places he used to work in years past — with the typical corporate hierarchies and silos. "Those don't exist at eCW," he says. "I am not saying that all 4,000 people are in the same place in the bell curve of understanding the company culture. But by and large we have all adopted that our goal and mission is to make customers successful and to reward innovation."

Although he is often urged to take the company public, Navani is reluctant. "Being a publicly traded company would take me away from focusing on the technology and customers to focusing on shareholders and return on investment. I am not ready for that kind of decision-making process, and I value my freedom far more than the dollar amount it would bring."

Nevertheless eCW is definitely in expansion mode. Two years ago the company would not have responded to international requests for proposals, because it was keenly focused on the U.S. market, but in the last year it has picked up customers in 12 countries, and in the first quarter the company set an all-time high for physicians added in a quarter, he says.

Navani is also eyeing the acute-care market led by Epic and Cerner. "I am not satisfied and not going to stop with being an ambulatory vendor long-term," he says.

KLAS' Bermudez says he is not surprised to hear that eCW is considering the acute-care market. "They are as advanced as anyone, if not the leader, when it comes to technology. I don't doubt that soon we are going to hear about them entering the inpatient space." ◆

Most Interesting Vendors: Cerner's $1.3 Billion Bet

Continued from page 32

"We started comparing what it would cost to [migrate everything to Millennium] and what it would cost to stay on Sorian – knowing that at some point it wouldn't be supported – and we conducted a financial analysis. In the end, working with Cerner and getting more functionality and integration would save us millions of dollars over a seven year period, if we could swallow the cost of a big-bang conversation," Anderson says. She adds in the past, the health system didn't think it could afford Cerner.

ONE YEAR FROM NOW

Cerner is approaching the one-year anniversary from when the deal was first announced. While the transition isn't finished, Burke and Flanigan are looking ahead to August of 2016. By then, they predict the different platforms will "indistinguishable" and Siemens' revenue cycle products and talents will be infused into Cerner. As some have noted, this is easier said than done. Companies like Allscripts struggled with large-scale mergers and were arguably worse off from their attempts at trying.

Cerner is confident though, that it can execute on this strategy, all while maintaining a level of nimbleness for a company of its size and staying competitive with its chief rival. "I don't know who the underdog or the heavyweight is, but we like where we're positioned, we like the level of investment we have here, we think this is a great place to be for the combination of healthcare and technology, and we're delivering this at a time where our clients need solutions to be better. I'm excited about our trajectory," Burke says. ◆

Up and Comers: Creating Invention Out of Healthcare Necessity

BY DAVID RATHS

To accompany our *Healthcare Informatics* 100 list of the largest companies in U.S. health information technology every year, we like to give readers a heads-up on some fast-growing companies that could very well make the *HCI* 100 in years to come. In fact, one of the companies we chose as an Up-and-Comer in 2014, Evolent Health, recently registered for a $100 million initial public offering.

Some of the firms in this group may not have much revenue yet, but their growth trajectory suggests they could have a significant impact on the healthcare sector. Others are coming at seemingly intractable problems in healthcare from completely new angles. Keep your eye on these six.

APERVITA: "DEMOCRATIZING ANALYTICS"

Here is a company that is trying to do something completely new. Its founders say they are "democratizing" analytics. What does that mean?

Founded in 2012 as Pervasive Health, Chicago-based Apervita Inc. is seeking to address the demand for health analytics and data by empowering leading health systems to commercialize and share their expertise, making it readily available through a marketplace.

Where did this idea originate? "We had the good fortune of spending time talking with executives from Mayo Clinic, Cleveland Clinic, Johns Hopkins, and others," says CEO Paul Magelli. "Today we have millions of health analytics built, but they largely end up on paper and published in *PubMed*. Cleveland Clinic does around 500 analytics a year as an institution and commercializes exactly one. It takes them a few years and a couple of million dollars and that is a highly ineffective process," he says. So Apervita came up with the idea of a community and a marketplace. It is seeking to allow institutions that demonstrate the value of analytics in a clinical setting to unlock that learning and allow others to subscribe to it. Early members of the community include Cleveland Clinic, Mayo Clinic, Leapfrog Group, and Diameter Health.


Paul Magelli

When it publishes its analytics solution, the publisher takes a majority of the revenue, with Apervita taking a small commission. "It is a little like the Amazon Kindle model," Magelli explains. Amazon allows you to self-publish a book and you retain the rights. It is just a digital distribution channel that takes a commission.

Apervita provides a cloud-based service. A customer organization routes the data to the cloud; it runs the computation and returns the result into the workflow where the clinician needs it. So another way Apervita makes money is from organizations that want to scale their computational use. For instance, if a health plan wants to apply a set of financial analytics to 100 million members, that is going to cost it more than a small practice that wants to run it across a few hundred patient visits. "So we offer a subscription that is usage-based but allows the smallest single-provider practice to get started at very little cost and then scale for usage by large organizations," Magelli says.

Magelli says some examples of analytics already available on the platform involve early warnings that something may be going wrong with a patient, such as sepsis or cardiac events. A company called CETA has partnered with Apervita to author and publish a suite of algorithms that identify chronic heart failure (CHF) patients at high risk for hospital readmission. A dashboard compiles the results of readmission risk algorithms put forth by organizations such as Yale University and Get With the Guidelines as well as CHF-specific thresholds for device readings and lab results. Clinical teams can see which patients have the greatest need for discharge and transition planning, as well as better coordination of care with the outpatient setting.

In January 2015, Apervita completed an $18 million Series A round of funding led by GE Ventures and Baird Capital to expand both the platform and its sales and marketing team.

The company has grown to 35 em-

ployees and expects to double that number soon, Magelli says. Following recent announcements of participation by Mayo and Cleveland Clinic, he adds, "You will see us make a large number of other announcements in the coming months of most of the other major institutions in the United States. Those include health enterprises, not just hospitals and not just clinical analytics."

Magelli calls the Apervita marketplace absolutely unique. "We don't see anyone else trying to democratize health analytics," he insists. "The idea is that you have choice, and the cost of acquiring analytics is 10 to 100 times cheaper than you could do it on your own. And the amount of time it takes you is 100-fold less. This isn't a two-year integration where you have to hope you chose the right analytics package. It is a very different model."

EARLYSENSE: TRACKING CRITICAL PATIENT HEALTH STATUS

How can hospitals get more immediate data about what is happening with patients in a medical-surgical unit? An Israel-based company is starting to gain traction because of the promising clinical research around its sensor placed under the patient's mattress to monitor heart and respiratory rate, as well as movement and sleep.

In clinical studies, EarlySense's solution has been shown to assist clinicians in early detection of patient deterioration and in identifying and preventing potential adverse events such as patient falls and pressure ulcers. Although it was founded in Israel, EarlySense has received FDA approval and has an increasing presence in the United States, including use in several Veterans Administration hospitals, says Tim O'Malley, the company's president.

EarlySense, whose U.S. headquarters are in Waltham, Mass., was actually created by its four founders as a way to monitor respiratory patterns of children with asthma in the home. Although the solution worked, they had trouble working through reimbursement issues, O'Malley says. So they expanded the use to encompass adverse event monitoring that could give early warning around specific events that had to do with heart rate, respiratory and body motion of a patient in the hospital. They introduced the current system just over three years ago.


Tim O'Malley

O'Malley says that once a patient leaves post-anesthesia recovery, they are usually not monitored as closely. "Lots of patients should be monitored on a continual or near-continual basis, but because of staffing issues they are monitored every two to four hours," he says. "During that four-hour period we are going to have 50,000 data points and can send messages to the mobile communication devices used by hospital staff."

EarlySense has received clinical validation from both research studies and adding user sites, O'Malley says. "Our visibility has increased significantly in the market over the last 12 months. When you start to see the impact on a patient population, it becomes a powerful discussion at that point."

Among its early users are two hospitals in Massachusetts: Metro West Medical Center in Framingham and Newton-Wellesley Hospital, which is the first hospital in the United States to implement continuous and contact-free monitoring on all of its general care beds, according to EarlySense.

In January 2015, EarlySense completed a $20 million financing round, led by Samsung Ventures with an investment of $10 million. Existing investors also participaing included Pitango Venture Capital, Welch Allyn, JK&B, Proseed and Noaber.

The company also has an impressive medical advisory board that includes David Bates, M.D., senior vice president for quality and safety and chief quality officer for Brigham and Women's Hospital in Boston.

"When you look at our advisory board, and Dr. Bates is a great example, their big concern is enhancing patient safety," O'Malley says. "They realize that as the Baby Boom generation ages, we are going to face big challenges and we need to have technology help us overcome those."

The privately held company does not reveal revenue figures, but O'Malley says the 70-employee EarlySense's revenue doubled from 2013 to 2014 and he expects it to double again this year.

HEALTH FIDELITY: NLP FOR HEALTH RISK ASSESSMENT

Health Fidelity is one of those startups that had to veer slightly from its original business plan, but has now found a very promising niche. Started in 2011 by a few former health IT executives and clinicians, the company sought to help organizations organize and analyze all the data being collected through the EHR boom. "We saw parallels between other IT systems that had collected a lot of data in operations such as ERP systems," says Anand Shroff, chief technology and product officer, and one of the co-founders. He calls Health Fidelity a classic Bay Area garage startup. "We spent time understanding what can be done with that data to see if a viable company could be built," says Schroff, who previously was vice president of health information exchange and EHR products at Optum. He came to Optum by way of acquisition of Axolotl Corp., where he headed product strategy and development.

But they soon ran into a familiar problem: unstructured data. "We figured out that most data from EHRs was unstructured and we couldn't run analytics on that data, even though it is high-value

data," Shroff explained. "It was a dead end. That was disappointing."

The Health Fidelity team contacted Prof. Carol Friedman at Columbia University, who is an expert in natural language processing (NLP). She had been working on the exact same problem, and they struck a deal to license some intellectual property that allowed Health Fidelity to build a high-quality NLP engine that would let it put the unstructured data into a form that would make it computable for business intelligence.


Anond Shroff

They also spent time interviewing executives from several leading academic medical centers to understand their pressing needs. "Outcomes analysis was one," Shroff says. "ACO [accountable care organization] cohort identification was another. A really interesting one that came to the surface was risk adjustment in Medicare Advantage populations."

The San Mateo, Calif.-based Health Fidelity worked with UPMC Health Plan in Pittsburgh, to use EHR data to find appropriate conditions to identify risk factors correctly. "UPMC wanted to apply NLP to patient charts so that chronic conditions could be found proactively," Shroff explained. "We worked with them over a year and built out our risk adjustment portfolio powered by our NLP technology." It went live in April 2014. UPMC was able to find conditions that existed in charts that generated significantly increased reimbursements for 2014, he adds.

At that point, UPMC Health System's venture arm, UPMC Enterprises, made a significant investment in the company to fund further growth.

Shroff says that NLP has been instrumental in demonstrating advancement in the risk adjustment space. When we spoke in June, Health Fidelity was preparing to announce a partnership with Evolent Health, a 2014 *HCI* Up-and-Comer that does strategic planning consulting and population health management for health systems.

The privately held company does not divulge revenue, but it has grown from 10 people in April 2014 to 40 now and will likely end 2015 with more than 50. "This is the year we are scaling up both headcount and revenue," Shroff says, "and our trajectory is expected to be significant over the next three years."

To lead that growth, Steve Whitehurst recently joined the company as CEO. He previously served as senior vice president and general manager of Stericycle, a biohazard waste disposal company. "He has had a number of experiences taking developed technology and commercializing and scaling companies. We were at the stage to do that," Shroff says. "The most exciting thing is that we are generating real returns for clients."

HEALTHSPOT: RETHINKING THE RETAIL EXPERIENCE

Many healthcare IT startups have a personal healthcare story behind them. The Dublin, Ohio-based HealthSpot is one of those. Five years ago, Steve Cashman, a successful IT entrepreneur, took his daughter to a CVS mini-clinic with swimmer's ear and was then sent to an urgent-care clinic, and neither experience was great, he says. The process got him thinking about the whole ecosystem of telehealth, retail pharmacies and health systems.


Steve Cashman

"I started thinking about what was driving these retail guys to put healthcare services in their stores and yet none of them could take care of this simple situation my family had," recalls Cashman. "So I was interested in how you get the quality of the health system into a retail store and combine those worlds. It led us on a journey to create software to could facilitate remote visit with managed devices."

Studying the issue, he found that physicians say that telehealth as it was practiced didn't allow them to look at the ear, nose and throat, or take blood pressure and temperature. They were just doing video chats, which didn't complete the visit, and insurers were reluctant to pay for them. Cashman's response was to create a kiosk for use in retail spaces that includes a video meeting with a clinician, but also features a blood pressure monitor, a scale, a thermometer, a stethoscope, an otoscope, a pulse oximeter and a magnascope to look at skin or the back of the throat. An attendant is always available to help the patient on-site.

Cashman says key turning points for the startup were in 2013 when it was able to arrange year-long pilot projects with Cleveland Clinic, Kaiser Permanente, Mayo Clinic, University Hospitals and Miami Children's Hospital. "Right away we had a swath of prestigious health systems and two of the top five," he says. "And the data that came back was the same across all of them: 99 doctor satisfaction and 98 percent patient satisfaction." All of the health systems that piloted use of HealthSpot kiosks have expanded their use since then, he added.

"The next magic moment is that we won a deal with Rite Aid," he says. "We always wanted to be in the retail pharmacy space, but we wanted

to have clinical efficacy first." The company recently rolled out its kiosks in 25 Ohio Rite Aid stores linked to four health systems, including Cleveland Clinic, Kettering, University Health and Rainbow Babies. "We are one of the first doing pediatrics in a retail setting and are seeing great uptake with that," he says. "We want to get in about 15,000 of the 60,000 pharmacies in America."

In 2014, Xerox made an investment of an undisclosed amount in HealthSpot, and has partnered with the company on data integration with EHR and billing systems.

The company recently beefed up its executive team as well. Gail Borgatti Croall, M.D., was named chief medical officer. She previously served as senior vice president and CMO for Anthem Inc. and OptumHealth, a UnitedHealth company. New chief operating officer Bruce Roberts served as the CEO of the National Community Pharmacist Association and co-founded SureScripts, a company focused on facilitating the connection between prescribers and pharmacies for the provision of electronic prescribing.

Although HealthSpot doesn't disclose revenue figures, it has grown from five locations in 2013 to 20 in 2014, Cashman says, and is aiming to close this year with more than 100 locations.

Cable giant Cox Communications also has invested in the company with an eye on how the platform could potentially be used for in-home visits as well. "We see a path to delivering the software and connected devices in the home," Cashman says.

PROPELLER HEALTH: MANAGING RESPIRATORY HEALTH

In 2010 David Van Sickle, Ph.D., founded a mobile medical device company called Asthmapolis to support both disease management and public health efforts.

Van Sickle had worked for many years as an asthma epidemiologist, including a stint with the Centers for Disease Control and Prevention.

As he studied outbreaks of respiratory disease, Van Sickle was essentially frustrated by the lack of timeliness and specificity of data.

David Van Sickle, Ph.D.

"We would get data from National Center for Health Statistics that was two to three years old," he told *Healthcare Informatics* in an earlier interview. Data was about hospitalizations and deaths but not about emergency room visits or about missed school or work, he noted, even though there are approximately 10 million office visits and 25 million missed days of school or work because of asthma. Also they were only getting one piece of geographic data: the person's address. Yet asthma events were also occurring elsewhere in the community.

"In terms of data, we were really only getting the tip of the iceberg," he says. "I thought if we could capture time and location, that would be instrumental. We could overhaul this through technology."

In 2006, while working at the University of Wisconsin, he started playing with chips and sensors with inhalers, trying to make it cheaper, lighter and smaller. His creation, Asthmapolis, attaches to a patient's inhaler and wirelessly syncs with a smart phone. A patient can track their triggers and symptoms and learn more about their asthma over time, and share that information with their physician.

Over the last few years, the Madison, Wis., company has continued to grow and find health system partners under a new moniker, Propeller Health.

"We realized that there was an opportunity to put the same type of technology to work across other respiratory diseases, not just asthma," Van Sickle says about the name change. "COPD [chronic obstructive pulmonary disease] patients are using a lot of the same medications and in fact had similar patterns to their symptoms." Programs around COPD have grown to be half the company's business, he says.

With investment from Safeguard Scientifics, the Social+Capital Partnership, and The California HealthCare Foundation, Propeller has grown to 45 employees and added a San Francisco office. It has three main types of customers: traditional health plans and insurance companies, at-risk provider groups and ACOs, and integrated health systems. For example, in 2014, the Arizona Care Network began offering its members with COPD the Propeller platform. The company also has worked with organizations such as Dignity Health, Wyckoff Heights Medical Center, and Amerigroup Florida.

At the fall 2014 Health 2.0 in Santa Clara, Calif., Van Sickle and Larry Brooks, the director of the New Business Model and Healthcare Innovation group at pharmaceutical company Boehringer Ingelheim discussed a pilot program in which Propeller built a sensor that could attach to the back of Boehringer Ingelheim's Respimat inhaler.

"We are starting to work more closely with pharmaceutical companies like Boehringer Ingelheim to bring versions of the Propeller system to market for their specific medications," Van Sickle says.

In Louisville, Ky., Propeller has been involved in a public/private partnership that has received funding from the Robert Wood Johnson Foundation to follow 2,000 area residents using the Propeller device. "That program has a strong public health component," he explained. "We can take information from daily life and put it to work, not just for the individual and their doctor, but for the broader municipality and applied public health efforts."

VALIDIC: PUSHING THE ENVELOPE ON WELLNESS


Ryan Beckland

Some successful companies find their niche almost by accident. Ryan Beckland, co-founder and CEO of Validic, started the company in 2010 with the concept of helping corporate wellness programs incentivize health behavior change. But the technology platform the company built to enable customers to track employee health devices turned out to be of greater interest to potential customers. Today, Validic's digital health platform connects patient-recorded data from digital health applications, devices and wearables such as Fitbit and Jawbone to hospital systems, pharmaceutical companies, payers, and others.

'We would be pitching to corporate wellness programs, and they would say, 'Wait, you can integrate all the data from these apps and devices?' They didn't care about our assessment programs and behavior modification modules," Beckland recalled. "Everybody was telling us the same thing: they were having problems accessing data." So the company spun out its integration platform and brought it to market in 2013. "It grew so fast we were inundated with demand for it," he says.

Since then, the company has grown its client population reach to over 160 million lives in 47 countries and now integrates with over 175 fitness and clinical devices and applications. EHR vendors Cerner and Meditech are using the Validic platform to integrate mobile health and in-home clinical device data into patient portals. In the first quarter of 2013, the Durham, N.C., company consisted of its two co-founders and four software developers. Today it has 50 full-time employees. "We plan to hire 60 more people in the next 12 months," Beckland says. "It is an exciting time, but also a challenge to grow an organization quickly."

"I'd like to think we have been smart about continually improving," he adds, "but we were just in the right place at the right time with the right product, and we saw that we had a tiger by the tail and did everything we could to capitalize on it."

Research firm Frost & Sullivan recently named Validic a "Top Ten Company Disrupting Healthcare," noting that its platform solves "key data integration challenges with devices and applications." Its disruptive impact stems from its ability to "enable next-generation patient engagement and population management for care coordination and wellness programs" by integrating data from fitness, clinical and other sources into one platform for action.

Validic recently secured a $12.5 million Series B round of funding led by Kaiser Permanente Ventures, the corporate venture capital arm of Kaiser Permanente. "We need to scale our organization," Beckland says. "What we will do in the next two years will absolutely dwarf what we have done in the last two," he says.

While Beckland says annual revenue is below $50 million, it grew about 1,000 percent between 2013 and 2014 and will grow roughly 400 percent between 2014 and 2015.

"We are very pleased with the customer response," he says. "We are stomping on the pedal with that funding from Kaiser to take this company to the next level."

THE DATA ANALYTICS JOURNEY: HEALTHCARE LEADERS ASSESS THE CURRENT MOMENT, AND THE PATH AHEAD

The reality, say industry experts and the senior leaders in patient care organizations, is that the journey into data analytics-driven healthcare delivery and operations transformation is still relatively in its infancy

By Mark Hagland

Where is the healthcare industry right now with regard to the successful use of data analytics? The answer to the question depends on a number of factors, but especially on two. It depends on the purpose or purposes for which the analytics solutions are being used—whether they be to support participation in value-based care delivery and purchasing regimens; participation in accountable care organization development; participation in population health management initiatives; participation in readmissions reduction work; or participation in other clinical or operational improvement initiatives, in hospitals, medical groups and health systems. The second factor has to do with how one defines "success," and the robustness of analytics use.

That having been said, 2014 and 2015 have been a time of explosive growth in the use of data analytics for the above uses, and more. As Healthcare Informatics has been reporting, healthcare and healthcare IT leaders have indeed been moving forward quickly on the analytics front as the purchasers and payers of healthcare—federal, state, and private—have been demanding greater value for expenditure.

For example, on June 16 of this year, healthcare leaders participating in a panel discussion of predictive data analytics at the Health IT Summit in Washington, D.C., spoke of the long journey that provider organizations are embarking on right now across the U.S. healthcare system, one that they realize is both daunting and a long-term proposition. As Perna wrote, most patient care organizations are just beginning their analytics journey, and in that context, most are focusing initially on specific areas of endeavor.

In one instance referred to in that discussion, Cherie Pardue, deputy CIO of the Gaithersburg, Md.-based Adventist Health integrated system, noted that she and her colleagues have created an algorithm that alerts providers to patients at risk for sepsis. They've also developed a risk stratification score for readmissions within its accountable care organization. The lesson, Pardue told the Health IT Summit audience, is that "You never finish truly collecting or massaging the data. As you work through it, there are always things to tweak and refine. But the work that she and her colleagues have done has been successful so far, resulting in a drop of readmissions from 20 percent to 8 percent. Meanwhile, the organization is working on further reducing its readmissions rate by working specifically on readmissions of diabetic patients.

"One of the things we've worked on is educating people," Pardue said. "The COO [has done] an amazing job of highlighting the data and how important everyone's role is in contributing to the data and interpreting the data. That was the first step into turning our culture into an informational-driven one. Quite often, we get the reports and people don't understand the role they play in the data that's presented on the reports with the accuracy."

The length of the journey ahead

The length of the journey ahead is only now beginning to be appreciated. In a discussion March 3 at the Health IT Summit in San Francisco, Shadaab Kanwal, executive director, Research & Quality, at the Oakland, Calif.-based Kaiser Permanente, led a panel discussion entitled "Driving Organizational Excellence with Analytics." During that panel discussion, David Kaelber, M.D., Ph.D., CMIO, of the MetroHealth System, an integrated health system in Cleveland, Oh., summarized the current landscape when he said, "You have to have data, tools, people and processes, to make all this work. In healthcare, we're just getting the data now, and maybe the tools. And in my own organization, we don't have the people and processes to scale in place yet to really do this. So many people think of analytics as an end unto itself," he added, "but analytics don't deliver care, they only help people. We're working on doubling our

mammography rate, and to do that, we need the tools."

What will be required, noted Jonathan Palma, M.D., medical director of IS analytics at Stanford Children's Health in Palo Alto, Calif. Will be the development of solid partnerships between and among clinical informaticists, other informaticists, and clinician leaders, in order to create early "wins" with analytics-driven clinical performance improvement projects. "One important partner we have is our quality and safety department," he noted. "When we partner with them around a defined set of goals, we can really make progress. We're doing root cause analysis around hospital-acquired infections right now," he reported. "Hopefully, that will lead to a change in the rates of infections."

Moderator Shadaab noted that "In the past, we've dealt with databases that were originally created primarily for research. Meanwhile, healthcare is still grappling with core cultural problems" around achieving consensus for analytics-driven change. How do we move from proprietary infrastructure to disease-specific databases," for more agile data use? he asked his fellow discussants.

"In San Mateo, we're beginning to make that transition now," noted Michael Aratow, M.D., CMIO of the San Mateo County Health System (San Mateo, Calif.). "The thing is that we all do use data in our daily lives, and even predictive analytics, like weather reports. And we always have our dashboards. Now we have to translate that" familiarity on the part of end-users in healthcare, with simple analytics in their daily lives, "into healthcare operations and clinical decision support."

Stanford Children's Health's Palma opined that, "From where I sit in information services analytics, I see it as both an opportunity and a challenge; in terms of changing the culture around the use of data, that's one of our responsibilities in informatics. I'd say we have a few pockets of reporting and analytics so far across Stanford Children's Health," he added. "And one opportunity is to help facilitate a data-driven culture."

Industry experts agree that developing high-level strategies around analytics, prioritizing initiatives and projects, gathering together the right combination of leaders representing clinical informatics, clinical practice, IT, and administration, and gathering together the needed resources, are all key challenges in the leveraging of data analytics for value-based care delivery and purchasing, accountable care, population health, readmissions reduction, clinical and operational performance improvement, and virtually every other endeavor.

Industry experts: high hurdles remain

The deeper obstacles to rapid advancement in the analytics space remain considerable, say industry experts. Most patient care organizations have developed or are developing some sort of analytics strategy that involves an enterprise data warehouse, and combining claims, clinical and supply chain data, notes Judy Hanover, research director at research firm IDC Health Insights. "They are trying to assimilate that information. Most have a number of different repositories and different degrees of success combining that information," she says, as noted in this issue's feature, "Healthcare Analytics: Moving from Setup to Use Cases" (p. 58). But, Hanover notes, free-text notes in the electronic health record remain unstructured, and the approaches to unstructured data are much further behind approaches that look at structured data, she says. "The value in unstructured data is clearly there for organizations that choose to tackle it, whether through text analytics or natural language processing."

Meanwhile, notes Larry Yuhasz, senior director of innovation and population health at Truven Health Analytics, "It is astounding how many organizations are creating enterprise-wide data warehouses and dumping in massive amounts of data without knowing about the stewardship of each data source. There are huge challenges around attribution, matching data to the right patient and the right physician, he adds. And, says Keith Figlioli, senior vice president of healthcare informatics at Premier Inc., the Charlotte-based healthcare alliance, data quality remains a key problem. "We just interviewed 50 to 75 people, ranging from executives down to analysts, and the No. 1 issue they mentioned by far is data quality," he notes. "It was two standard deviations away from all the other issues. By far the No. 1 thing we talk about with members is data governance. We are seeing professionals come from other industries, such as consumer product goods and insurance, migrate to healthcare because they understand data governance."

Tools for the path ahead

Right now, all industry experts and healthcare leaders agree, there remains some degree of fuzziness regarding the path ahead on data analytics. That is so not only because of the wide variety of goals, objectives, challenges, and opportunities involved, but also because of the fact that the leaders of even the most advanced patient care organizations readily admit that their organizations are just beginning the analytics-facilitated transformation of care delivery and operations in earnest. Looking ahead, experts and leaders say, the proof will be in the proverbial pudding, as the most advanced organizations blaze trails for their colleagues elsewhere to follow. Until then, the journey remains one fraught with challenges, but equally lined with opportunities for the genuine transformation of the U.S. healthcare system.

SHARED HEALTH INTELLIGENCE: A WATERSHED MOMENT

After the Black Death ravaged Europe in the mid-14th century, physicians recorded and analyzed what had happened in hand-written manuscripts. A century - and many plagues - later, early European printing presses reproduced these homespun theses as the first printed "plague treatises."

These books contained advice for everyday people on preventing and curing plague, along with higher-level discussion for medical practitioners regarding plague's etiology, symptoms, and treatment. The printing of these plague treatises represented a watershed in the management of medical knowledge: Information about disease was now being shared, allowing knowledge from universities to flow out to the general public.

With the widespread adoption of digital health records, we now find ourselves at another watershed moment in how we organize, distribute, and apply medical knowledge. The information contained in digital health records is the catalyst for the creation of health analytics: algorithms, quality and safety measures, pathways, and protocols, that can be seamlessly integrated into workflow. But these analytics are currently too much like those old hand-written manuscripts: They often don't make it out of the pages of medical journals, and the few that do, typically remain trapped within electronic health record and data warehouse systems.

Further, despite the undeniable value of decision support and business intelligence, the past decades' health analytics solutions have proven un-scalable. As EMR adage goes, "solve the problem once, and you've solved it once."

The health "printing press" of today is an overarching system of digital knowledge - Shared Health Intelligence. The power of Shared Health Intelligence comes from its ability to allow anyone to quickly create, distribute, and infuse thousands of computable health knowledge analytics into workflow. Shared Health Intelligence gives every health professional access to the world's best minds. A powerful example is a predictive risk score designed to alert clinicians when patients deteriorate in hospital, signs that nurses and doctors often miss because it requires continuous analysis of minute changes in vital signs. This risk score alone has the potential to save tens of thousands of lives.

Apervita is playing an essential role in building Shared Health Intelligence infrastructure by creating the world's first and fastest-growing trusted analytics community and marketplace unique in the health space. With Apervita, in as little as an hour, an analytic can be created, connected to health data, and applied to workflow. The author decides if they want to share their analytic within their enterprise or globally through the marketplace.

As health knowledge constantly evolves, the Apervita community continuously launches new analytics as an increasing volume of evidence is collected and put to use. Analytics become even more precise as data that supports them grows exponentially via daily use and feedback.

Our goal should be to make the world's health knowledge truly collective: available for use by all for the benefit of all. Shared Health Intelligence, like the printing press before it, will transform how we share and use our knowledge, and with that, will empower us to deliver better health everywhere.

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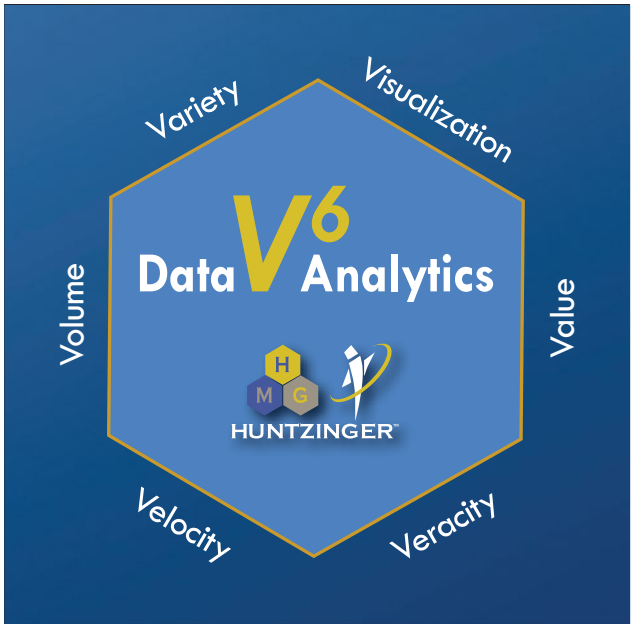
Democratizing Health Analytics & Data

MANAGING BIG DATA'S 6 V'S IN HEALTHCARE

In 2012, it was estimated that electronic health information (eHI) worldwide approached 500 petabytes with an expectation that eHI growth would continue at a rate of "between 1.2 and 2.4 exabytes a year" (Kuo, 2014). Such a quantity of data focused on a single domain, healthcare, would be considered to be "BIG" based on any definition, and healthcare, like many industries, is struggling with the strategic and tactical implication of BIG Data, Data Analytics (DA), and Business Intelligence (BI).

It has come to be generally accepted that Big Data is described in terms of three characteristics - volume, velocity, and variety. Given the critical nature of healthcare data, veracity has been added to the definition. A newer but growing data concept is visualization, while the data's value is what ultimately drives DA initiatives.

Data **Volume** represents the quantity of data to be stored, with the typical focus being solely on the amount of data and the associated storage technology that is required. However, do we thoroughly consider related aspects such as the people and processes necessary to maintain and analyze this vast volume of data? Do we explore what data can be discarded or tiered to a more economical environment?



Velocity refers to the timing and speed at which data flows into and out of an organization. Historically, data was processed in batches at discrete times. Now, data can arrive at virtually any time. And the speed at which data is being created, processed, and itself creating more data, is faster than ever before. Velocity also refers to the "speed of the feedback loop" – how fast can data be presented back to the stakeholders to support meaningful decision-making (Dumbill, 2015). How are you managing the DA transition from retrospective, to concurrent, to prospective?

The **Variety** of data in healthcare presents some of the biggest challenges to a DA strategy. With the multi-disciplinary focus of the practice of medicine and the traditionally silo'ed approach to implementing information systems to support the various clinical constituencies, data is not stored as neat, normalized, enterprise-standard structures. Text, images, and raw data in standard and non-standard formats present technical challenges. The lack of enterprise-wide data governance and management initiatives has resulted in an absence of standard codification of critical data sets and de-normalized data, sometimes with conflicting data values. What future data sources, such as the personal health data identified in Stage 3 of Meaningful Use, need to be considered when developing a DA strategy?

Because healthcare data involves a great deal of human interaction as it is created, the **Veracity** of the data is an important characteristic. This term refers to the inherent amount of credibility that is found in the data. A significant portion of healthcare clinical data is in the form of free text.

These human-inspired data stores can provide a great deal of analytic value when incorporated correctly. Unfortunately, all too often veracity is compromised by having conflicting versions of the data, i.e. lacking a single "source of truth." How is the veracity of your data viewed?

Visualization of the data is a rapidly evolving concept. Analytics must be prepared and presented in such a way that the knowledge can be readily understood and transferred into actionable decisions. The presentation back to the stakeholders and users must be agile enough to ensure presentation of the data is comprehendible. This means not only numbers and spreadsheets but also graphs and charts, as well as alerts and even analytic-driven workflows. How do your users want to see and use the analytics created from your data? How can you use data visualization concepts to improve your decision making?

The sixth and most important characteristic of BIG Data is its **Value**. BIG Data is necessary for meeting regulatory requirements and is essential for addressing the dimensions of healthcare's Triple-Aim – balanced attention to population health, the patient experience and cost of care reduction. The challenge to BIG Data and DA initiatives is to collectively add value via analytics to data stores that often have a low value relative to their individual original formats. It is critical to develop a DA strategy that will maximize the value a healthcare organization receives from BIG Data and that will provide a roadmap to effectively manage the other five Vs – Volume, Velocity, Variety, Veracity, and Visualization.

Dumbill, E. (2012). Volume, Velocity, Variety: What You Need to Know About Big Data. Forbes, http://onforb.es/xZhLOV.

Kuo, M.-H., Sahama, T., Kushniruk, A. W., Borycki, E. M., & Grunwell, D. K. (2014). Health big data analytics: Current perspectives, challenges and potential solutions. International Journal of Big Data Intelligence, 1(1/2), 114-126.

The IHI Triple Aim Framework was developed by the Institute for Healthcare Improvement in Cambridge, Massachusetts.

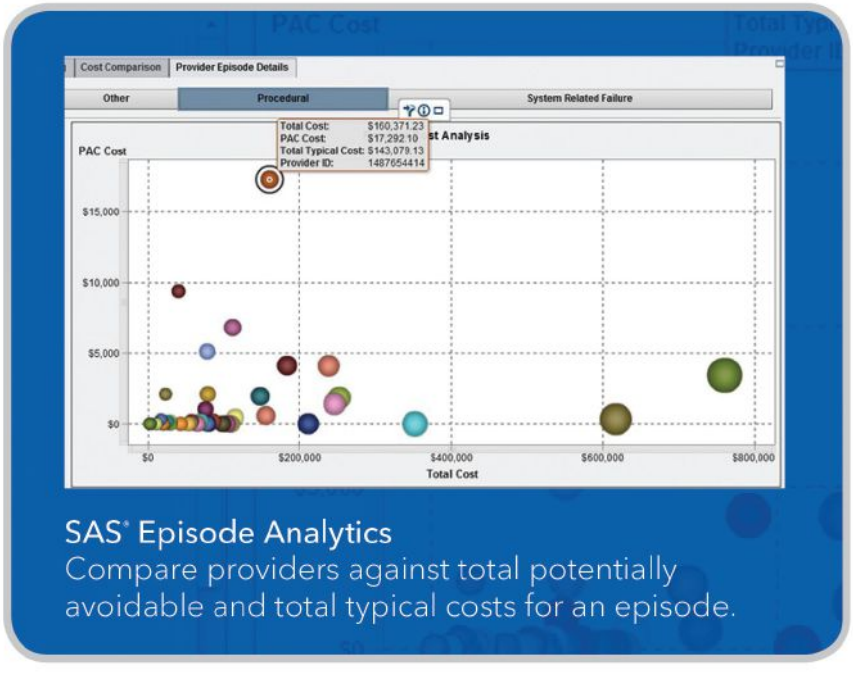
INCREASING VALUE IN HEALTH CARE – ANALYTICALLY SPEAKING

We're well on our way from fee-for-service to fee-for-value. And you know it all too well. A value-based system that is more accountable and risky. Greater demands for quality at a lower cost. No more waste. No room for error.

So how can you achieve better health care delivery and outcomes, all while managing rising costs? The answer is in a value-based model with analytics for episodes of care.

What's episode analytics?

To oversimplify, an episode is a comprehensive grouping of medical care that spans all services for a condition or procedure. Based on data, episode types are defined by which services in a given time period are related to a clinical episode – for instance, knee replacement – and what care is unrelated, such as another episode occurring in the same time period. More and more frequently, payers and providers are working to establish set fees, or bundled payments for an episode of medical care, effectively establishing a financial incentive for providers to work as a team to share responsibility for a patient's health. Episode analytics provides a way to understand the dollars it takes to deliver services in an episode, which portions are complications, and how an episode is related to another condition. The more data, the better, to confidently understand and manage outcomes, as well as the financial risks and rewards.



The challenges

Health data is invaluable. However, its complexity makes it challenging to manage and even more difficult to extract value from without the right tools and technologies. This is one of the leading reasons why some health care organizations are still struggling to find their footing in the value-based health care ecosystem. But some organizations have successfully piloted and adopted episode analytics into their care strategies – and they've improved because of it. They're gaining insights across the entire care continuum. And they're able to get data visualizations to see how all of the moving parts of care work together for any given care episode.

"Any health care organization, not just those participating in bundled payment or ACO arrangements, seeking to identify and understand cross-continuum care variation will find episode-based analysis an invaluable place to start on the journey of data-driven discovery and improvement," said Graham Hughes, MD, Chief Medical Officer of SAS.

Bringing value to the care continuum

Analytics for episodes of care allows providers and payers to confidently understand the services that go into medical outcomes and how they should be evaluated. They can understand the complexity of patient care in context of episodes and know what services are provided to individual patients – both on a granular level and in aggregate. There's no guessing. This data provides insights that can help reduce unwarranted admissions and readmissions, decrease length of stays, improve cost-effective prescribing, reduce variation in care and treat patients holistically.

"We know that treatment plans for patients with orthopedic, heart failure, pneumonia and other conditions have high variability in terms of cost, quality and outcomes," said Mark Caron, CEO of Geneia. "By using predictive and episode analytics, we enable physicians and hospitals in ACOs and other care delivery models to identify, analyze and improve the episodes of care provided to these patients."

Using analytics to analyze episodes and the cost of care at both the population and patient levels, provider organizations can determine if services delivered were well suited to a given condition and whether a given service is typical or indicative of a complication. Distinguishing between typical, complication-related and unnecessary services provides opportunities to identify and reduce preventable complications and improve care efficiencies.

The SAS® difference

SAS applies advanced analytics to complex clinical and financial data so providers can be more efficient in selecting and acting on opportunities and payers can limit risk.

With SAS, organizations can derive clinically relevant episodes of care from patient service and diagnosis information. Episodes such as a joint replacement, stroke or congestive heart failure are defined collections of services spanning the care continuum over a period of time. While services related to the patient's condition are differentiated from those that aren't, SAS Episode Analytics also identifies which

are potentially avoidable – like infection, readmission or adverse medical event. This is invaluable to help providers bring the clinical team into the improvement process because it provides clinical evidence that can drive change.

Using analytics for episodes of care to enable value-based payment strategy, operations and improvement adds value for payers and providers alike. "Payment reform is a complex process, and we are very supportive of the efforts of the Ohio Governor's Office of Health Transformation," said Bob Gladden, Vice President, Center for Analytics at CareSource. "This includes incorporating highly individualized episodes of care that have been developed for this program and require flexibility beyond a standard episode definition set. The SAS Episode Analytics tool is a key component of our ongoing strategy, to not just satisfy these customized episodes, but allow us to develop other pay-for-performance and quality programs. A bonus is this allows us to incorporate these outputs with other quality metrics we have developed with the SAS Analytics foundation utilized by the Center for Analytics."

With the right tools, health care organizations can truly share in the reward of achieving a higher standard of care with a patient-centric focus – all made possible with analytics.

sas®

A NEW VIEW OF HEALTHCARE DATA ANALYTICS

From the perspective of an internal data customer, a report request sounds so simple: all they want is the data, in the right format, at the right time. It's left up to the IT professionals to worry about and work out all the behind-the-scenes details that complicate matters, such as integrating data from disparate silos, structuring the database, configuring reports, selecting the right reporting tool, staffing appropriately to manage requests, and addressing the myriad of additional concerns that make these "simple" requests difficult to deliver—all while hospital leaders continually demand faster results, leveraging real-time data.

Data analytics from any desktop: too good to be true?

A hot topic for hospital IT and executive leaders is the concept of self-serve business intelligence. In theory, the concept sounds ideal and appears to address staffing and cost issues. The idea is to empower users by placing data management and reporting tools in their hands—bypassing the traditional analyst and shortcutting the time from request to report. However, this approach has its own challenges. Someone still needs to work behind the scenes to normalize and manage the data, and the complications and expense of data management cannot be overstated. In our conversations with large health systems, we've learned of one health system that employs 65 analysts to manage their data warehouse. Another was quoted a cost of $5 to $8 million to build an enterprise data warehouse (EDW) that may not be usable for 18 to 24 months. These costs and staffing requirements are difficult to justify when there are so many competing initiatives vying for a piece of a limited IT budget.

Solving the self-serve BI dilemma

At HIMSS15, a number of industry analysts noted that, despite the large number of self-identified "data analytics" companies, none were fully able to deliver on the insights healthcare providers need to manage their business. Many BI platforms are unproven or operate from a limited data set, and most continue to operate from an outdated EDW mentality unsuited for current data complexities and self-service demands.

The ideal model for self-serve BI must move beyond the standard "EDW plus data analyst/report writer" approach that remains prevalent today. A future-proof data analytics solution needs to check a number of boxes:

- Built on a proven healthcare platform
- Designed to be scalable and cost-effective at any size
- Merges clinical/EHR data with back office systems for a new, holistic view of the healthcare business enterprise
- Employs automated workflows for built-in data governance and normalization
- Is configurable to your organization's policies and procedures
- Includes intuitive, easily configurable and reproducible report templates to simplify self-service
- Leverages centralized and standardized data while delivering customizable reports and analytics specific to the user

Managing healthcare's data analytics and business intelligence needs will never be simple. But finding the right solution, with the right approach, is a giant step in the right direction. Visit us online at: **www.sentryds.com/anewview** to find out how our approach differs from the status quo.

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3 CRITICAL FIRST STEPS IN HEALTHCARE ANALYTICS

When you're implementing healthcare analytics, it can be hard to know where to start. It's tempting to try to tackle everything at once, but unfortunately, this mindset often leads to failure.

Rather than taking on too much too quickly, it's important to focus on a few key areas in the beginning:

- User community perspectives, opportunities, and imperatives
- Data governance
- Business rules
- By focusing on these, you'll be able to stay ahead of the game and increase your chances of success.

#1: User perspectives, opportunities, and imperatives

If there's one thing you can do to ensure success, it's to get inside the heads of your users. This seems obvious, but is often the last thing considered. Understand your users' domains, empathize with their challenges and priorities, and comprehend information from their perspective. Here are some things to focus on:

What are the most critical problems? Understand what users are trying to solve and how analytics could help.

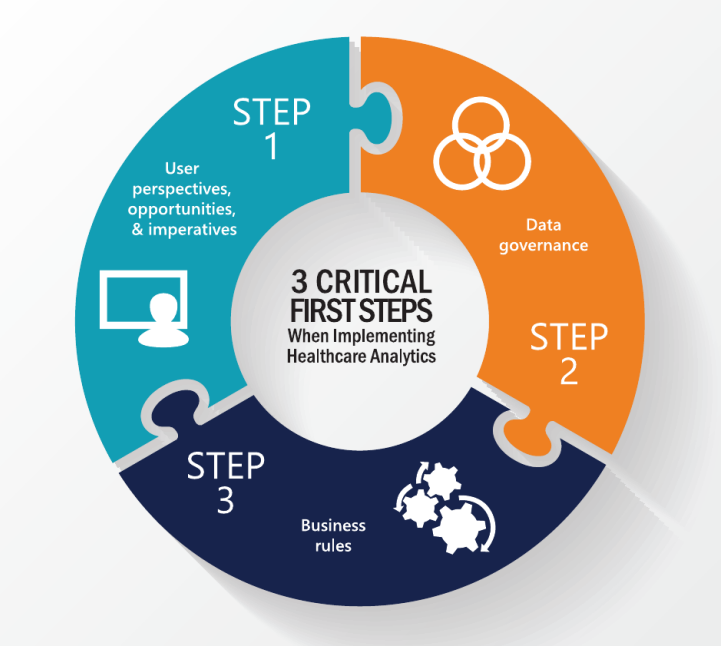
What transformations are necessary for data to be meaningful? Data from transactional systems often doesn't include useful measurements. Therefore, you must figure out what measurements are most valuable and how to define them.

What visual contexts will most effectively tell the story of the data? Visualization is about identifying and understanding patterns to see the forest through the trees, which is most effectively done through a combination of measurement and summarization.

The most important information is typically highly summarized and presented in a visually intuitive way. The very granular, detailed data may ultimately be important, but getting there is typically a result of finding a pattern worth investigating.

#2: Data governance

Data governance refers to processes that dictate how data is managed in your healthcare organization. This is critical to address at the beginning of your analytics project so everyone trusts the validity of your data. Business



users typically know what they want to do with data, but they don't understand the intricacies involved in conditioning it so it reflects reality. Conversely, IT has a good handle on the data, but doesn't always understand how it gets used. That's why ironing out data governance and understanding one another's point of view is critical.

This doesn't need to be bureaucratic or complicated. Consider the essence of the problem, which is that there can be multiple versions of the truth. Solving this problem requires:

- Bringing together the user community, including leadership
- Reaching consensus – or agree to disagree on certain issues
- Formalizing the process

#3: Business rules

Intertwined with data governance are business rules, which refer to the transformations applied to your data between the original data source and the user presentation. An example of a business rule in healthcare relates to how length of stay is measured. There are many different ways to define this measure and there are multiple

definitions that help answer different types of questions. Are you focused on certain populations: acute vs non-acute, adult vs. pediatric, elective vs. emergent? Do you need to stratify by disease type? Are you considering patients that haven't been discharged from the hospital yet?

Before you can begin meaningfully analyzing your data, you'll need to both define and implement these rules. Then you need to "close the loop" through the data governance process to ensure everyone understands what measure they are working with, how it's defined, and what it's intended to measure.

Done well, business rules are the foundation of that "single version of the truth" that is so essential to effective analytics. They help determine what data is actually needed to produce relevant and reliable quantitative measurements. But getting to consensus on definitions requires collaboration, common understanding, and compromise.

Agreeing on measures and rules may be the most important, and challenging, part of the whole analytics puzzle. Be forewarned: if you shortcut this step, you'll pay the price down the line as individual users will "roll their own" business rules. This could end up exacerbating the "single version of the truth" problem.

However, by diligently following these three steps, you will set your organization up for success in both the near-term and long-term.

Case Study: Analytics ROI in Less Than 12 Months

Henry Mayo Newhall Memorial Hospital, based in Valencia, CA, used analytics to drive its goal of becoming a more "digital" hospital, and to provide greater insight into MEDITECH data.

The hospital wanted to achieve ROI from its analytics tool, The Diver Solution™ (Diver) by Dimensional Insight, within 12 months. It did so by following these four steps.

Start small

A single department approach to business intelligence accelerated project rollout and process improvement efforts that required tapping into data from multiple areas.

Stick to the strategic plan

Having an outline of exactly which areas needed to be measured led to better prioritization and focus on value-producing projects.

Adopt a single tool environment

Standardizing on Diver accelerated development productivity and maintained data integrity. Diver's focus on business rules led to trust in the data.

Use consulting services for knowledge transfer

Dimensional Insight's consulting services provided "immersion" training to help kick-start more difficult projects.

Results

A first project focused on improving patient flow in the emergency department. With Diver, Henry Mayo identified important metrics and used that knowledge to reduce bottlenecks during the triage process.

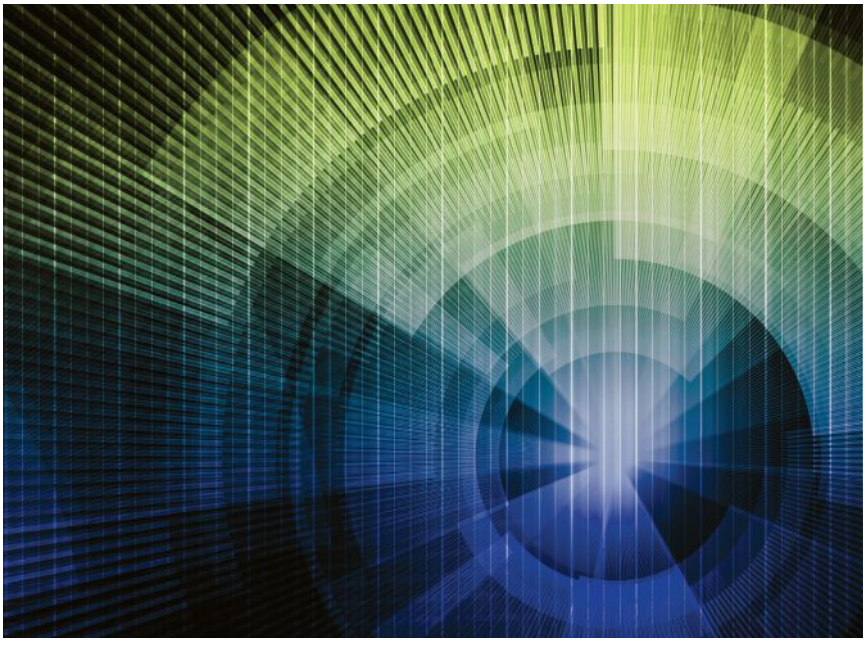
As a result:

- Average "door-to-doctor" time is now under 10 minutes
- ED Entry to Triage, 80% improvement
- Triage to Room, 60% improvement
- Room to Physician, 63% improvement
- 50% year-over-year decrease (past two years) in patients leaving the ED unseen
- $1M/year in increased revenues attributed to improvements

Healthcare Analytics: Moving from Setup to Use Cases

Pioneer patient care organizations are moving rapidly to leverage analytics for population health and accountable care. What have they been learning in the process?

BY DAVID RATHS



Over the last several years, *Healthcare Informatics* has had the privilege of covering the birth and toddler stages of the data analytics movement in healthcare. Our editors have spoken with the chief information officers and chief medical information officers of some of the pioneering organizations as they set up data warehouses and data marts, the robust business intelligence capabilities, and data governance and quality initiatives. The exciting thing now is that even though many organizations continue to struggle with setting up programs, those leading organizations are moving from talking about analytics to actually applying it to multiple use cases.

Keith Figlioli, senior vice president of healthcare informatics at Premier Inc., recently spoke with *Healthcare Informatics* during the meeting of his organization's Data Alliance Collaborative, which includes representatives from 12 of the largest health systems across the country.

In the past year things have matured fairly rapidly, said Figlioli, who heads up Premier's enterprise technology and data initiatives. "The discussions we have been having over the past three years have all been about big data and merging claims and clinical, for both operational and population health reasons. The discussions we have had over the last 48 hours have been so fundamentally different from even a year ago," he said. The provider organizations are moving away from just setting up the infrastructure. In large systems, they invest six months to a year to set up the infrastructure to begin to do analytics. It takes a considerable amount of time to get enterprise data management and governance in place, he said, but these organizations are now beyond that. "You are seeing them proliferate the use cases throughout the whole organization," Figlioli said. "It is exciting."

One example *Healthcare Informatics* has highlighted is the 42-hospital Carolinas HealthCare System, which has devoted considerable resources to its efforts to leverage analytics capabilities to support population health initiatives. The organization has done some impressive work with predictive analytics on cutting readmissions related to chronic obstructive pulmonary disease.

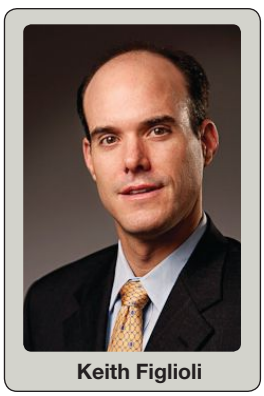
But if the leading health systems are poised to make great progress, other organizations still have hurdles to get over. Most have developed some strategy they are trying to execute that involves an enterprise data warehouse, and combining claims, clinical and supply chain data, says Judy Hanover, research director at research firm IDC Health Insights. "They are trying to as-

similate that information. Most have a number of different repositories and different degrees of success combining that information."

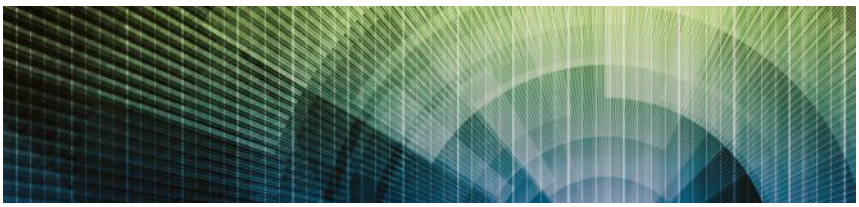
DATA QUALITY AND GOVERNANCE

Data quality is a huge issue, Hanover adds. Free-text notes in the EHR are unstructured, and the approaches to unstructured data are much further behind approaches that look at structured data, she says. "The value in unstructured data is clearly there for organizations that choose to tackle it, whether through text analytics or natural language processing."

"It is astounding how many organizations are creating enterprise-wide data warehouses and dumping in massive amounts of data without knowing about the stewardship of each data source," says Larry Yuhasz, senior director of innovation and population health at Truven Health Analytics. There are huge challenges around attribution, matching data to the right patient and the right physician, he says.


Keith Figlioli

Figlioli agrees that data quality is a key problem. "We just interviewed 50 to 75 people, ranging from executives down to analysts, and the No. 1 issue they mentioned by far is data quality. It was two standard deviations away from all the other issues. Even somebody with a single instance of Epic or Cerner, and a single instance of an ERP, once they pull all that together, they start realizing how bad that clinical data is," he says. Even more complicated is pulling data from affiliates into your system. "They are having all sorts of challenges intermingling with other pieces of data. It is a pretty complicated set of issues once you start getting into it," Figlioli says. By far the No. 1 thing we talk about with members is data governance. We are seeing professionals come from other industries, such as consumer product goods and insurance, migrate to healthcare because they understand data governance."



"THE DISCUSSIONS WE HAVE BEEN HAVING OVER THE PAST THREE YEARS HAVE ALL BEEN ABOUT BIG DATA AND MERGING CLAIMS AND CLINICAL… THE DISCUSSIONS WE HAVE HAD OVER THE LAST 48 HOURS HAVE BEEN SO FUNDAMENTALLY DIFFERENT FROM EVEN A YEAR AGO."

–KEITH FIGLIOLI, SVP OF HEALTHCARE INFORMATICS, PREMIER INC.

ANALYTICS TALENT SHORTAGE

In fact, the dearth of data analysts is a massive problem, Figlioli adds. "It is the single biggest gap across the industry right now. Even if you get the infrastructure and data governance in place, then what?" he asks. "The data is served up. Do you have front-line analysts who know how to do this?" He jokes that if you changed your title to data scientist on LinkedIn, you would have 50 job offers by the end of the day.

One reason these jobs are tough to fill is that the executives need not only analytics training, but also clinical and operational expertise and skills in being able to wed together data from different functions, Hanover says. "They have to understand the origins and elements that are contained in that data and how to be sensitive to that and put it together in a way that yields meaningful results," she adds. "That is a rare skill set, and most successful programs have a really skilled person at the helm."

Hanover says the industry is starting to see new job titles such as chief analytics officer. "These new titles that are emerging reflect the role that analytics plays in bringing their business model forward." The talent shortage is one reason there is a lot of interest in analytics as a service. Vendors can employ data scientists and leverage economies of scale to deliver data management to a number of organizations as a service, she says.

As the healthcare market transitions from fee-for-service to value-based payment, it will have a big impact on what analytics efforts measure and how they measure it, notes Truven's Yuhasz. There is a growing focus on paying for episodes of care and avoiding readmissions, he says, but an episode could be two days or it could be six months for some chronic conditions.

"That temporal dynamic is very challenging for those designing analytics," Yuhasz says. The data you use

over time changes in terms of where it delivers value. Reading vitals in an inpatient setting every 15 minutes is crucial, but in post-discharge case management that is no longer of much value. "Creating the filters over time, by encounter and by user, is another interesting challenge," he says.

Yuhasz also says both payers and providers have to change their mindset around sharing data. Health systems are going to have to get claims data. It is not particularly valuable at the point of care, but for managing performance it is incredibly valuable, he says. Health plans and commercial accountable care organizations (ACOs) need the clinical data. "This is where convergence is happening in experiments, where they are collaborating."

Judy Hanover

Shawn Grannis, M.D.

In the fee-for-service world, the data itself was often considered a strategic asset. But in an at-risk world, even those who spent millions on an enterprise-wide EHR system do not have all the data on their patients. "And all of a sudden, the blind spots they have create tremendous risk, when they work with affiliate physicians or long-term-care providers," he says.

Yuhasz says he sees customers just beginning to experiment with predictive analytics. The challenge is that in order to validate the hypothesis, you have to create a learning cycle, he says. "You have to say here are the assumptions of risk for this patient and pick an intervention. But how do you know the predictive model works unless you go back and assess? We see lots of examples of customers in the first blush of making assumptions, but not yet completing the loop."

Figlioli says more organizations will start to feed the results of analytics to the point of care over the next few years. "That will pick up pace as the tolerance for data-based decision-making makes its way through healthcare," Figlioli says, "but we are probably still in the first inning there."

THE ROLE OF HIES IN ANALYTICS

Shaun Grannis, M.D., associate director of the Center for Biomedical Informatics at the Regenstrief Institute in Indianapolis, Ind., spoke about the increasingly important role health information exchanges (HIEs) can play in analytics efforts. Grannis has been studying the intersection of HIEs and analytics with the Indiana HIE. His research has shown that patients do not receive all their care in one health enterprise. For instance, 40 percent of visits in Indiana to emergency departments are by patients who come from different healthcare systems.

"So If I want to understand healthcare utilization patterns, I need to integrate data from multiple sources," Grannis says. "If I am an ACO and want to have a complete picture of the patients I am responsible for, I need integrated data from people who are sometimes my competitors. We have agreed that integrating data to improve outcomes makes sense. So our HIE in Indiana actually provides ACOs data for analytics purposes."

In fact, he says, the ACO model has been a nice boost for HIEs, and opened up a new waterfront of opportunities of services to provide. "The ACO model is a pattern we will see repeat itself over the next several years," Grannis says. "It requires data in an integrated, standardized fashion. We can provide predictive models to identify high healthcare system utilizers."

Data quality is always a central challenge in the HIE space, he notes "We always want more complete data," Grannis says. "When you look at aggregate healthcare data, there is heterogeneity there. We are doing work to accommodate the noise, pluck the signal out, and set realistic expectations. But we see nothing but continued improvement in that data quality."

As Grannis put it, "There is substantial value in this aggregate data today and it will improve over time. The game now is finding those bright spots in current data where it shows real value. It will get better, and the value of analytics will continue to grow." ◆

"[I]F I WANT TO UNDERSTAND HEALTHCARE UTILIZATION PATTERNS I NEED TO INTEGRATE DATA FROM MULTIPLE SOURCES. IF I AM AN ACO AND WANT TO HAVE A COMPLETE PICTURE OF THE PATIENTS I AM RESPONSIBLE FOR, I NEED INTEGRATED DATA FROM PEOPLE WHO ARE SOMETIMES MY COMPETITORS." –

SHAUN GRANNIS, M.D., ASSOCIATE DIRECTOR, CENTER FOR BIOMEDICAL INFORMATICS, REGENSTRIEF INSTITUTE

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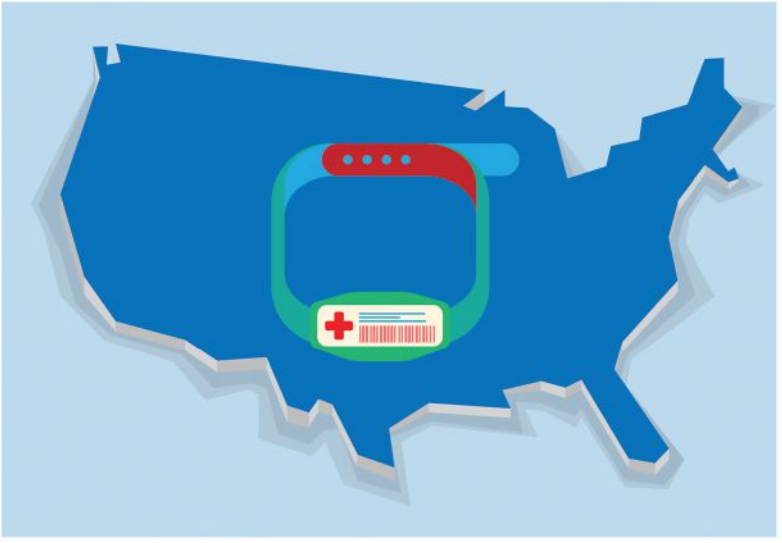
CHIME Moves Forward on a Challenge-Based Plan for a National Patient ID

Leaders at CHIME are moving forward assertively to stimulate a challenge, or contest, to spur the invention of a private-sector solution to the problem of the lack of a national patient ID in the U.S. BY MARK HAGLAND



Leaders at the Ann Arbor, Mich.-based College of Healthcare Information Management Executives (CHIME) are pushing ahead in their efforts to accomplish the creation and adoption of a national patient identifier. CHIME's senior leaders are agreed: it is absolutely time for the United States to adopt a national patient ID. The problem? There's a core challenge on the policy level, as the U.S. Congress passed legislation several years ago actually forbidding the adoption of legislation to create a national patient ID.

As a result, CHIME's leaders have been creating a policy workaround. They've partnered with the international HeroX Foundation to create a challenge-based process whereby they can stimulate inventiveness in this area, leading to the awarding of a $1 million prize for the organization or group that develops a solution that can be scaled nationally across the U.S. and, they hope, become a universalized solution in this area.

"THE SOLUTION SHOULD BE PRIVACY-ENHANCING; IT SHOULD BE SECURE AND RESILIENT; IT NEEDS TO BE INTEROPERABLE OR SUPPORT INTEROPERABILITY—THAT'S KEY; IT HAS TO BE COST-EFFECTIVE TO BECOME NATIONALLY SCALABLE; IT NEEDS TO BE VOLUNTARY; AND IT SHOULD BE ABLE TO SUPPORT CLINICAL WORKFLOWS."

–KEITH FRAIDENBURG, CHIME'S EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY OFFICER

As announced in a March 17 press release, "The College of Healthcare Information Management Executives (CHIME), the healthcare industry's leading professional organization for chief information officers and senior IT executives, is calling on innovators throughout the U.S. and around the world to participate in the CHIME National Patient ID Challenge. In an effort to find a universal solution for accurately matching patients with their healthcare information," the press release said, "CHIME will launch a $1 million challenge early this summer on the HeroX platform, co-founded by XPRIZE CEO Dr. Peter Diamandis."

And it quoted CHIME CEO and president Russell P. Branzell saying that "There is a growing consensus among payers and providers that a unique patient ID would radically reduce medical errors and save lives. Incomplete or duplicate health records," Branzell said in the press release, "present significant issues in terms of patient safety, and there is a pressing need for preventing, detecting and removing inaccurate records so hospitals can positively match the right data with the right patient in order to provide the best possible care."

Keith Fraidenburg, CHIME's executive vice president and chief strategy officer, spoke recently to *HCI* Editor-in-Chief

Mark Hagland regarding this initiative. Below are excerpts from that interview.

You and your colleagues have been pushing very hard on this initiative around the development of a national patient identifier. What is the landscape around that initiative right now?

National patient ID is really, really hot. We're happy to see that it's actually being discussed in DC, on the Hill, in Congress, at the agencies. It wasn't that long ago when I was going to meetings with agencies and Senate committees, and such, and people would literally say, "We know what you want to talk about, and we're not going to talk about it, so let's move on"—and I heard that in a Senate committee! That was two years ago And where we are today, it's in the media, it's in the news. And when we meet with ONC, they ask us how they can be supportive and helpful. So there's a growing recognition that this is a critical issue that has to be resolved.

What, at the highest level, would you like to have happen?

Our ultimate desire, which has driven us to this path of working with HeroX, is to identify a solution. The end-state of this is that we will be able to present to the industry a solution for a national patient identifier. HeroX is an offshoot of the X Prize Foundation; they're best known for launching rockets. They help produce challenges to spark innovation in many different fields. The challenges that X Prize runs are in the 10, 20, upwards of 50 million-dollar range now. So as they've moved up in scale and scope, they've created HeroX. HeroX's challenges are generally for a million dollars or less. Our prize is for one million dollars. As XPrize gets bigger and bigger, now you have HeroX.

So they're hoping that vendors will create a solution?

Yes, it's like global crowd-sourcing. They have a database of something like 5,000 companies, ranging from start-up organizations to small non-profits, to for-profits, to universities. So HeroX and XPrize bring access to these potential competitors to the table, in a platform that connects them with people who have the potential to support it. It's possible that a company from China might come in to solve this; it doesn't have to be U.S.-based or healthcare IT-based.

When will the challenge launch, live?

It's still in pre-launch phase; we'll be able to announce the scheduling of a live date sometime soon. Meanwhile, we're in the phase of challenge design right now. We're developing the criteria that competitors have to fulfill. And with an issue as complex as a national patient identifier—we're getting close to being able to publicly share in draft form the challenge requirements, so that we can crowd-source and provide feedback—we're within a few weeks of being able to offer those requirements.

Very broadly, what kinds of things are going to be in the criteria?

Let me give you some broad criteria; the actual requirements will be much more detailed. But the solution should be privacy-enhancing; it should be secure and resilient; it needs to be interoperable or support interoperability—that's key; it has to be cost-effective to become nationally scalable; it needs to be voluntary; and it should be able to support clinical workflows.

What are your expectations around what level of activity will come out of this challenge?

We would love to see hundreds of potential competitors. In the pre-registration stage right now, approximately 50 organizations have indicated preliminary interest in the competition. We've really been overwhelmed by that level of preliminary interest already. We've been so hard at work working on the design requirements, we haven't really spent much time promoting the challenge itself, so that is very heartening. Our hope would be to possibly garner 100 or even 200 competitors. That would be a moon shot, but we'd love to see that. And outside HeroX, I don't know how you could bring in that many bright minds to solve something this complex—which makes it very exciting.

This will be a private, voluntary solution, but you're hoping it will be doable and therefore will be adopted across the U.S. healthcare system?

We're talking about intellectual property issues now; our hope is that if and when this solution is developed, will live in some sort of public/private collaborative. In order to be scalable and achieve the aims we're setting for it, it would be difficult if it were totally private and proprietary. Fully open-source would be ideal; perhaps somewhere in between would be where this might end up; but we're still working out those details.

And after you award the prize, you're going to try to get everyone to participate, right?

Yes; it obviously has to be voluntary. And the best we can do is to shine a spotlight on this and say, this is what our industry has been looking for, for a long time. We've come up with a winner based on a very rigorous process, and here you go. You can't force anyone to adopt something if it's voluntary, obviously. But if you look at the press release on the launch of the challenge, a number of organizations, including AHIMA, CommonWell, and others, were very supportive. I think as an industry, our hope is that if we can identify the solution—and we're extremely transparent about the requirements and the rigor—that the industry would be hard-pressed to say no.

Staying Prepared in a Hot M&A Environment in Health IT

Many in health IT are delaying interviewing great candidates and sitting on offers like it's 2008. Bad move. BY TIM TOLAN

Tim Tolan

It' s that time of year again – time to see which healthcare IT companies made the *Healthcare Informatics* 100 list, and how they rank in 2015. It's also a chance to see which companies have fallen off the list for a variety of reasons including all of the consolidation that's been taking place in our market; as well as to read about some exciting Up and Comers. The merger and acquisition environment in the HCIT market remains very strong and the amount of capital invested today in this market is nothing short of phenomenal. There is significant demand by both strategic and financial buyers and expect that to continue for the foreseeable future. One example of this trend is in the digital health space. Funding for U.S. companies in the digital health space in 2014 was $4.1 billion, nearly equal to the total funding of the previous three years combined. That's huge!

HCIT consolidation covers the waterfront: it includes larger more established companies but also includes smaller start-ups and medium size early stage companies. Most of these companies have invested capital in some very unique niche solutions while others have focused on solutions for more developed markets with a seemingly better mousetrap. All of these players struggle with the same challenge: It's hard to achieve meaningful scale without sufficient capital. These strategic and financial buyers are seeking to add a new line of business or enter the market while these niche players are seeking capital to grow to the next level.

This consolidation, while normal in the business world can plan havoc on the human capital in these companies and create stress and possible financial hardship for some of the employees impacted. Here are a few tips to make sure you don't get caught flat-footed if your organization is involved in a merger or acquisition:

Keep your network active and updated. Make sure your LinkedIn profile reflects your career success and highlights metrics that recruiters and future employers would be interested in. Join groups that connect you with people that have similar backgrounds to yours or new groups or niches that interest you.

Make a commitment to add 15-20 new LI contacts each week and connect with people and companies that interest you. I started using LI about 10 years ago and now have nearly 4,000 direct 1st degree connections and have access and can reach well over 1M people in this space.

"KEEP YOUR NETWORK ACTIVE AND UPDATED. MAKE SURE YOUR LINKEDIN PROFILE REFLECTS YOUR CAREER SUCCESS AND HIGHLIGHTS METRICS THAT RECRUITERS AND FUTURE EMPLOYERS WOULD BE INTERESTED IN." —TIM TOLAN

Keep your resume updated and make sure you review it periodically to ensure the information is correct. When using bullets below each position you've held—make sure they are listed in the order of importance that a potential employer cares about. In other words list your greatest career accomplishments to help you stand out in the sea of other candidates.

Keep in touch with the references that you'll need to provide to your future employer. Make sure that you stay in touch with them constantly and not just when you need them. That's never a good plan.

Look for signs that things are changing in your company and don't be the last person to leave the boat. Too many candidates I speak with wait too long to consider dipping their toe in the water. It always helps to have options and it never hurts to pursue something new and exciting before the hammer comes down.

Make sure you keep your head about you and don't overreact to changes from a merger or acquisition that leaves you on the outside looking in. if you sense something is happening—get busy. Looking for a job is truly a full time endeavor and candidates must dedicate time on a regular basis to make connections and to develop relationships before any chaos begins. It's just a good practice.

Finally, try to project a good attitude and demonstrate you are a team player when you are interviewing and in pursuit of your next job. Hopefully when the shoe falls you will be well ahead of the curve. ◆

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