Beyond Y2K: No Rest for the Weary

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When the dust of Y2K has settled, what information systems projects will be next on the to-do list? The authors look at four trends you won't be able to ignore.

The turn of the century is only three months away. By now, it is to be hoped, most healthcare organizations (HCOs) have completed the majority of their mission-critical software remediation efforts. Interface testing, investigation of supply chain preparedness, and contingency planning are still consuming more time and resources than most would have predicted a few years ago. Only time will tell whether the year 2000 (Y2K) "bug" merited all the attention it has received, or whether that attention was sufficient to prevent the frequently predicted disaster scenarios.

What we do know about Y2K is that it has caused substantial reprioritization of information systems (IS) projects and tremendous costs and internal and external resource commitments. It has also become an essential hurdle for HCOs to overcome if they are to stay in business. As the deadline looms, progressive HCOs have begun to examine the next set of business and technology drivers they will face once this crisis passes. While it is too early to know for certain whether any of these issues will constitute another Y2K in terms of money, time, and staff required, four "hot buttons" will prevent healthcare IS departments from taking any kind of post-millennium breather:

- HIPAA: will it be as big as Y2K?
- e-commerce: will it lead to new stakeholder roles?
- enterprise applications: a framework for deployment
- data: healthcare's untapped asset

When the Y2K dust settles, HCOs will face not one but four nearly all-encompassing initiatives. While HCOs will undoubtedly have many other projects on their plates, each of these initiatives could potentially reinvent how healthcare is delivered and supported, and each will certainly present new and demanding information systems management challenges. The initiatives have four underlying objectives: to ensure regulatory compliance, to improve business performance, to improve customer relationships, and to improve clinical outcomes. Only by demonstrating achievement of these objectives will HCOs remain competitive or even viable.

HIPAA: Will It Be as Big as Y2K?

When Congress passed the Health Insurance Portability and Accountability Act (HIPAA) in 1996 it probably did not intend to turn healthcare information processing upside down; nonetheless, that appears to be the effect. Among other things, HIPAA mandated the US Department of Health and Human Services (HHS) to develop a set of regulations concerning the privacy and security of health information. HHS issued recommendations and proposed rules that were published in 1998 (to view the text of proposed rules, go to http://aspe.hhs.gov/admnsimp/bannerps.htm#security). They apply to providers, payers, and clearinghouses that handle (either store or transmit) individually identifiable healthcare information. More so than any regulatory drivers to date, the HIPAA security regulations will force HCOs to replace paper-based patient charts with computer-based patient record systems (CPRs). The implications for HCOs' IS and medical records departments are substantial. They include the following:

- *administrative procedures*—The regulations mandate formal documented processes for a wide variety of security activities, including establishing access controls, certifying compliance with security regulations, maintaining chain-of-trust agreements with information exchange partners, establishing contingency plans to ensure proper operation across various types of failures, handling security incidents, and establishing an internal audit procedure. A properly designed CPR security system will play a major role in supporting these activities

- *physical safeguards*—HCOs must identify a person or organization responsible for all security issues. The CPR security system must provide assistance in activities such as disaster recovery and supporting emergency modes of operation

- *technical security services*—These services guard stored data and control access to information. HHS regulations require that CPR security be in place based on at least one of three possible models: context-based access, role-based access, or user-based access. In addition, the security system must have provision for an emergency access mechanism to handle urgent situations requiring data access outside the scope of normal operations. A particularly challenging requirement is to support a patient authorization mechanism that permits patients to indicate what health information can be disclosed to whom

- *technical security mechanisms*—These are intended to protect data during transmission. Requirements include integrity controls to ensure that messages are not altered during transmission, message authentication to ensure the identity of senders, and access controls or encryption to protect messages in transit. User authentication, audit trails, event notifications, and security alarms are also required for internal private networks

- *electronic signatures*—Although no proposed standard EDI transactions or other procedures have yet required electronic signatures, the proposed regulations mandate the use of a cryptography-based digital signature if electronic signatures are used. Furthermore, HHS has broadly hinted that forthcoming standards for medical attachments to referrals will require electronic signatures

- *transaction sets*—HCOs that use proprietary transaction sets to communicate with payers will need to revise them. HIPAA outlines in significant detail the transaction sets that will be required of all HCOs that submit billing information electronically. This represents perhaps the closest parallel to Y2K remediation, as vendors and HCOs will have to modify and test hundreds of software applications, then retest all of their internal and external interfaces

Taken together, these changes mean that, for some HCOs, HIPAA-mandated changes may equal or exceed those required to accommodate Y2K. These requirements may be augmented by healthcare privacy legislation currently under consideration in Congress or by further HHS regulations. The combination will lead to substantial revisions to software and processes involved in the handling of patient-identifiable information—both internal and external to the HCO.

E-commerce: Will It Lead to New Stakeholder Roles?

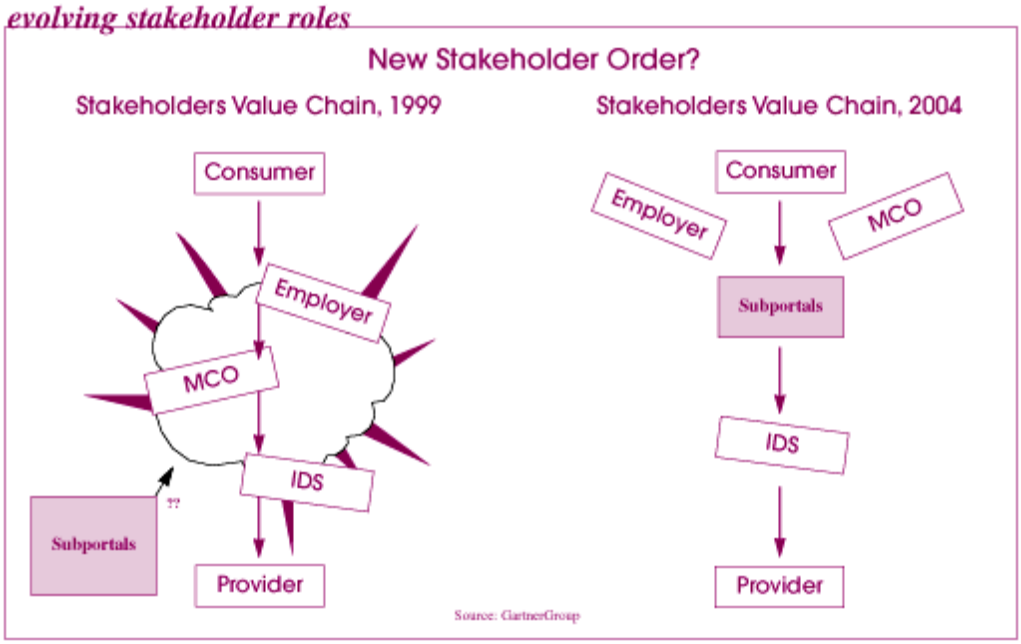
Driven in part by HIPAA legislation, a number of factors will align over the next five years to dramatically affect the volume, breadth, and design of healthcare e-commerce products and services between all stakeholders—such as purchasers, consumers, physician and delivery systems, and payers. Key factors that have an impact on e-commerce evolution are:

- *healthcare cost management and consumerism*—Increasing concern over rising healthcare costs, reimbursement trends, and consumer backlash against managed care quality and restricted care access have all led to a renewed search for more efficient, cost-effective administrative processing and for enhanced-quality care guided by outcomes research. Consumers—weary of battling payers and healthcare professionals for responsive, effective care—are seeking and using healthcare information to better manage their own care. In a joint study by Deloitte and Touche and VHA, completed in 1999, 17.5 million Americans (43 percent of Internet users) reported using the Internet to search for health-related information.[1] Nearly half reported seeking information on a particular disease; many were interested in health educational services, medications, physical fitness, and alternative medicine. As expected, the Internet is proving to be a strong medium for the dissemination of healthcare-related information to consumers and a catalyst for increased consumer responsibility and participation (in partnership with physicians) in healthcare decisions

- *technology, security, standards, and XML*—Implementation of mandated security and transaction standards will create a more comfortable perception of Internet-based transactions among users and simplify data formatting. The data format Xtensible Markup Language (XML) provides the tools to simplify the representation of portable data and e-commerce transaction management. Tools to secure and simplify e-commerce and transaction management will be important catalysts to increase and sustain healthcare e-commerce

- *vendor products*—Consolidation and increasing experience with e-commerce will enable vendors to provide cheaper and more comprehensive e-commerce solutions for HCOs. Vendor products will increasingly provide "plug and play" functionality in the form of subportals—gateways to information on the Web—which provide comprehensive content or functionality that can be integrated into an existing branded Web site or e-commerce initiative (examples of subportals include consumer healthcare information sites such as WellMed.com, DrKoop.com, and WebMD.com). The combination of competing short-term priorities, the technical and management complexity of solutions (for HIPAA compliance and security), rapid technology and product obsolescence, lack of skilled staff, and continued demand by trading partners for multipayer solutions will drive HCOs to adopt the use of vendor products and subportals and, in many cases, to outsource system management

The most significant effect of increasing e-commerce will be its impact on stakeholder roles and the healthcare value chain (see "Evolving Stakeholder Roles"). These trends have profound implications for HCOs. Many e-commerce systems will disrupt current stakeholder relationships and processes, automating existing processes in the healthcare value chain and creating new relationships—particularly with the consumer—that bring into question stakeholder value. For instance, Internet subportals are changing consumer access to information. Public and widely available access to this information may diminish the role of other parties, such as health plans, as "health educators."



Similarly, e-commerce applications for healthcare purchasing are emerging, and content subportal vendors are providing healthcare information and direction to consumers—in part circumventing the consumer's relationship with both the health plan and the provider. E-commerce vendors are, at least in part, becoming competitors to many HCOs.

The reality for HCOs is that e-commerce will not just be a tool to enhance the current healthcare environment, but one that will catalyze process reengineering for the entire healthcare value chain, led by increased consumer interaction and demands for better administration and quality services. Given dissatisfaction with many HCOs' customer service, consumers are likely to easily accept new entrants (subportals) to the value chain that add value in terms of information transmission and management and discard existing participants that do not.

Enterprise Applications: A Framework for Deployment

GartnerGroup market research indicates that enterprise master person indexes (EMPIs) and clinical data repositories (CDRs) are the top enterprise application priorities for US integrated delivery systems (IDSs). These two systems form the critical path for enabling almost all other top application initiatives (especially CPRs, clinical decision support, and enterprise scheduling) by enabling the transition from a specimen- and data-centric (or encounter-based) view of information to a "person-centric" (episodic) view.

The combination of an EMPI, a CDR, and a "message broker" (interface engine) fulfills an IDS's minimum technology requirements for beginning to fully support business and operational requirements from an IT perspective. Without a unique patient identification methodology and central demographic repository in place (the EMPI), registering, scheduling, and billing a patient for encounters across the disparate care settings of a typical IDS is not feasible. Also, without a comprehensive storage and display mechanism for clinical data (the CDR), the process of managing the ordering and reporting of tests and treatments and then deciding on the most appropriate care protocols for a given diagnosis will continue to generate less than ideal outcomes. Having an EMPI in place has the added, essential benefit of helping the HIM department identify and clean up or merge duplicate patient charts, either via a batch reporting process or in real time at the point of registration.

Thus, the EMPI and CDR must be functional before any of the other top application initiatives can be moved into production across an IDS. Many IDSs have already begun implementation of these systems but have temporarily halted or slowed their rollouts until Y2K passes. Meanwhile, the largest healthcare software vendors have continued to invest in research and development to better enable these systems to meet IDSs' needs. As they resume or begin their installations, IDSs will find a market with increasingly mature and demonstrable product offerings.

Beyond EMPIs and CDRs, many HCOs will continue implementing other enterprise systems with the goals of reducing costs and increasing clinical quality and patient satisfaction. As of 1998, between 33 and 50 percent of IDSs reported firm plans to begin selection and implementation of the applications listed in "IDS Enterprise Application Planning Status, 1998" within 24 months.

IDS Enterprise Application Planning Status, 1998

Application (Category)	Priority (Rank)
EMPI	1
CDR	2
Enterprise scheduling	3
Orders management	4
Enterprise registration	5
Clinical decision support	6
Enterprise billing	7

Source: Gartner Group

Data: Healthcare's Untapped Asset

Pressures of medical cost inflation and the backlash of consumer and provider dissatisfaction are threatening the survival of HCOs. A key to the future success and even the survival of these organizations will be their ability to maximize the value of their most valuable asset: data. GartnerGroup predicts that by 2003, only 20 percent of HCOs will be able to deliver timely and accurate information on utilization, cost, and quality to all of their constituents. Because this is such a critical market demand and competitive differentiator, this implies that the viability of the remaining 80 percent of HCOs will be threatened.

Historically, two options have been available to HCOs for meeting reporting and analysis requirements:

- build a customized data warehouse, using internal resources or contracting with a relational database management system (RDBMS) vendor or a healthcare vendor/consultant
- build or license multiple tactical reporting solutions

The first strategy results in a warehouse that, while technically elegant, lacks healthcare-specific business intelligence applications and, consequently, is underused. The most successful strategy from a user perspective has been multiple best-of-breed tactical reporting solutions. However, this is not a winning strategy for the corporation at large, since such strategies result in inconsistent data quality, redundant data extracts, and a management nightmare. HCOs that continue to invest and deploy multiple tactical reporting applications will realize less than 50 percent of the value of their data.

Rationalizing the investment in a data warehouse has presented tremendous challenges for HCOs. Most have been unable to afford a customized data warehouse (usually more than $5 million, with 18 to 24 months elapsing before users get meaningful

information). For many HCOs, the only alternative has been to deploy multiple tactical solutions to meet the most pressing reporting requirements.

Vendors and users share responsibility for the lack of value derived from data-reporting efforts and investments. However, progress is being made. A best-of-breed strategy has begun to evolve from data warehouse consultants and system integrators. It provides generic but customizable data models (either payer or provider) and offers clients best-of-breed healthcare business intelligence applications (e.g., HEDIS reporting, ORYX, cost accounting). Tactical reporting vendors in healthcare are redesigning products to include more flexible data models, and some are unbundling healthcare-specific reporting methodologies to deploy as data marts from existing data warehouses.

Although these are promising initiatives, they are unproven. It will be mid- to late 2000 before fully executed healthcare-strategic data management solutions will be available. HCOs must begin to rationalize their multiple tactical reporting applications while they initiate a data warehouse strategy. In the interim, HCOs must be prepared to manage either the limited flexibility of tactical reporting solutions or the limited healthcare-specific business intelligence capability of a data warehouse solution.

Does Normal=Chaos?

Soon the Y2K scramble will be over. Too many HCOs have spent the last two years saying, "We can't wait until we finish this project so things will finally get back to normal." But the fact is, we live in perhaps the most rapidly changing time in mankind's history. Technology is driving that change, and "normal" now means "chaos." Given that no other industry has either the information complexity or burden of regulation that healthcare does, it is clear that there will be no rest for the weary when January 2000 arrives. These four initiatives are critical to HCOs' survival. They will be simultaneous undertakings. They will continue to stretch already thin resources. And, if HCOs successfully address each challenge, they will have reinvented healthcare as we know it.

Note

1. Deloitte and Touche/VHA. "1999 Environmental Assessment: Rising to the Challenge of a New Century." Deloitte and Touche/ VHA, 1999.

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Article citation:
Burghard, Cynthia, et al. "Beyond Y2K: No Rest for the Weary." *Journal of AHIMA* 70, no.8 (1999): 40-44.
