CHAPTER 1

Market Background

Change is the law of life. And those who look only to the past or present are certain to miss the future.

—John F. Kennedy (1917–1963),
thirty-fifth President of the United States

E-Health

What is *e-health?* Is it merely a fashionable buzzword from the 1990s? Is it a new way for marketing professionals to distinguish their healthcare offerings, or just a way for them to repackage their old offerings? E- (electronic-) health is all about technology. *E-information* is today's revolutionary market tool across all industry sectors. The term *tools* is used in the context of electronic processing of a particular operation. It is the technology of communicating, processing, and deriving information in electronic form. E-information will continue to impact the healthcare industry. Although the market players (patients, providers, payers, plan sponsors, and other third-party service providers) within the *healthcare continuum* (HCC) remain intact, how each functions within the continuum along with their diagnostic tools and treatment protocols continues to change.

What has changed? What is new? E-health initiatives essentially implement new, evolving forms of electronic communication and processing tools in our current healthcare system. As e-health initiatives continue to emerge, we may learn better ways to redefine the roles of our market

players. In fact, we should expect some traditional roles and processes to continue to change in scope as technology modernizes the healthcare industry.

Evidenced-based medicine is being presented as an e-health opportunity. Evidenced-based medicine can be defined as

> The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine requires the integration of individual clinical expertise with the best available external clinical evidence from systematic research and our patient's unique values and circumstances.[1]

The key e-health initiative would be the assimilation of *external* clinical evidence. Most providers are creating internal electronic systems to be more efficient within their organizations. Providing structure to health clinical outcomes from external sources would impact how we make decisions in healthcare. The audit concerns would revolve around ensuring the security and integrity of the external information being integrated with internal evidence. This opportunity should be developed within a contemporaneous internal audit control environment.

We often hear the term *efficiency* directly correlated to e-health. If someone needs to obtain a prior medical record of a patient in a traditional paper record system, it requires physically going into a file room. If someone needs to study how a patient or a series of patients responded to a treatment plan, she must engage in a set of manual processes to achieve a certain level of intelligence from the information. In other words, because a paper system is manually driven, it requires more labor hours to arrive at a particular outcome.

E-health initiatives provide the opportunity to reduce the labor associated with the retrieval of healthcare information. Similarly, electronic tools that sift through large amounts of data at a speed and consistency unmatched by any human provide the opportunity to reduce the labor associated with the processing and reading of each paper page of information.

But is there any guarantee that e-health initiatives will make all aspects of healthcare processes more efficient? In a recent audit of an e-health system, the task of organizing a patient's health information and determining what, where, when, why, and how a patient was treated clinically

and financially was found to be more time consuming than that same task in a traditional paper system.

The number of e-health tools that simply do not have a clear *e-audit trail* within their systems is alarming. If a bank implemented similar types of e-financial tools, then someone could walk into its vault at any time without any tracking of his activities. The audit of a 500-bed hospital in which the new state-of-the-art e-health system had the ability to track additions and deletions of a medical record showed that the system design did not include a control to prevent a user from deleting or adding an entire medical record episode. Another 250-bed hospital purchased a system that in essence merely tracks the activity of the last user. For example, someone could enter a medical record and record a narrative. Another user could walk in behind her and rewrite her narrative, and the system would keep track of only the last entry and have no record of the original entry. On the financial side, there are systems in which the billing side will purge account activity once the account is closed. If that provider was subjected to any audits, it would have no ability to follow the money. Imagine being presented with an audit from Medicare or Medicaid that wanted last year's accounts in which claims were submitted. In your response, you would have to clarify that the system you purchased automatically purges all accounts and you can no longer retrieve the information. Having a system that leaves your organization noncompliant with the ability to audit your claims is a significant high-risk situation to be in.

E-health is about digital healthcare data in electronic form that designated market players generate, transfer, and utilize. The technology behind e-health consists of digital tools, electronic tools, and network exchanges conceived and built to facilitate the transfer of such data. One of the foremost ongoing concerns about e-health lies in the management of its technological growth. How, for example, will we manage data when the materials and equipment (hard drive storage technology) used to create that storage become obsolete? Another significant concern regarding e-health involves the effect that varying rates of technology adoption among the market players will have on the healthcare system. The concept of interoperability thus refers not only to market acceptance of electronic media utilization but also to an environment in which the market standard drives consistent use of current technological capabilities.

From an audit perspective, the critical question concerning e-health focuses on its impact on *market roles and processes*. We will examine this impact in closer detail.

How Is Electronic Information Created?

The following is a very brief overview of the history, terminology, and acceleration of developing technologies.[2] The evolution of technology provides the foundation for the auditors' information diagram in Exhibit 1.1. The latter half of the twentieth century has seen an explosion in new technology. While they may have started as government experiments or research projects, the results of the development projects have become a part of our everyday lives. Everything from television to computers to cell phones is a result of this technological revolution. We live in a digital age, and it is defined by technology and innovation. The tools used today to execute various functions within the healthcare domain are a result of this digital age. They can be classified into the following categories: electronics, computers, networks, software, and storage.

The digital age really began with the development of the transistor in 1947 by Bell Laboratories. Transistors are semiconductor devices that can manipulate electronic signals. They are the basis of all digital circuits, including microchips, which use millions of microscopic transistors to power everything from calculators to cell phones. Transistors are the building blocks of all electronics, including computers.

The transistor made building electronics faster and cheaper, and allowed manufacturers to build smaller and smaller devices. Electronics that were once the size of a room are now able to fit in the palm of our hand. The advances over the years have influenced the tools used in healthcare and have increased the accuracy and quality of healthcare. From digital thermometers to MRI machines, all aspects of healthcare are affected by the growth of electronic tools.

In speaking of electronics, one cannot ignore the most significant electronic tool: the computer. While computers predated the development of the transistor and modern electronics, those early vacuum-tubed giants were really used only in government and corporate research. With

advances in digital circuits, computers became cheaper, faster, and more available than ever before.

This in turn spurred the growth of new ways to use computers as software and programming languages were created and implemented. For example, the introduction of FORTRAN (short for the *IBM Mathematical FORmula TRANslating System*) in 1957 enabled a computer to perform a repetitive task from a single set of instructions by using loops.[3] Developed in the early 1950s by the Stanford Research Institute, with funding from Bank of America, ERMA (Electronic Recording Machine Accounting) explored the automation of check handling and posting. When it went into production in 1959, Bank of America had a reliable solution to automate checking accounts. To get there, it had to overcome a number of hurdles, one of which was finding a solution to automate inputting of check information. This led to the creation of *magnetic ink character recognition*. Now checks could be preprinted with magnetic-ink font characters that could be read automatically or by humans. These are still visible at the bottom of the checks we use today. In 1960, COBOL was introduced for business use; LISP, for writing artificial intelligence languages; and Quicksort, for increasing the speed of data sorting. A few years later, the introduction of the American Standard Code for Information Interchange (ASCII) enabled machines from different manufacturers to exchange data.

Computers also had to be able to store the information they processed. In the beginning, this was done with punch cards. Advances in data storage technology grew as the need for more storage was created by the advances in computing. The more power the digital circuits or microchips had, the more processing they could do, which led to more information being processed and the need for larger storage capacity. In the 1950s, IBM introduced disk storage technology to the world when it launched the IBM 305 RAMAC, which could store 4.4 MB on 50 24-inch platters back in 1956. We have come a long way since the IBM 305 RAMAC, as *storage area networks* (networks of shared storage devices) can store terabytes of information. We carry around flash drives that hold over 4 GB and are smaller than a pack of gum.

Storage is a vital component of an auditor's checklist for any e-health system, and the ability to ensure the confidentiality, integrity, and availability of the information stored is vital.

The final piece of the puzzle was *networking*, or the ability to have computers communicate with one another. This really began in 1960, when AT&T designed the data-phone, a commercial modem that converted digital computer information into analog signals. The data-phone set the stage for a series of advancements in data transmission over the next decade. ARPANET was born in 1969, from the Defense Advanced Research Project Agency of the U.S. Department of Defense. Its goal was to enable communication between research laboratories, universities, and the military.

ARPANET was in fact the predecessor to the Internet, but it did not gain the public's attention until the early 1990s. In 1975, Telnet became the first publicly available commercial network service. Established in 1980, USENET is one of the oldest communication systems still in use today. At its inception, USENET allowed users to post and reply to public messages more than a decade before the World Wide Web by relying on the UUCP protocol to copy messages from one server to another. In 1983, the military portion of ARPANET was broken off as a separate network, MILNET. Before the break off, ARPANET was comprised of 113 nodes; today it is estimated that more than 1 billion people use the Internet. ARPANET became what we now know as the *Internet*.

The Internet is now a worldwide publicly accessible series of interconnected computer networks that exchange data using the Internet Protocol suite. The Internet Protocol suite (sometimes referred to as *TCP/IP*, based on its two most important protocols—Transmission Control Protocol and Internet Protocol) is a set of communication protocols that allow for standardized communication between hosts connected to the Internet or other private networks. The Internet serves to transport a variety of information using services like the World Wide Web and electronic mail.

The *World Wide Web*, created by Tim Berners-Lee, is comprised of a series of interlinked documents accessible via the Internet. The Hypertext Transfer Protocol (HTTP), a member of the Internet Protocol suite, allows for the transfer of information on the Web. The commercialization of the Web in the mid-1990s sparked online commerce as it allowed companies to create a presence online. Today, the Web has become a ubiquitous technology along with electronic mail.

Electronic mail, often abbreviated as *e-mail*, is a method of exchanging messages over a communication network such as the Internet. Having its roots in a variety of protocols, it allows users to compose, send, and receive messages.

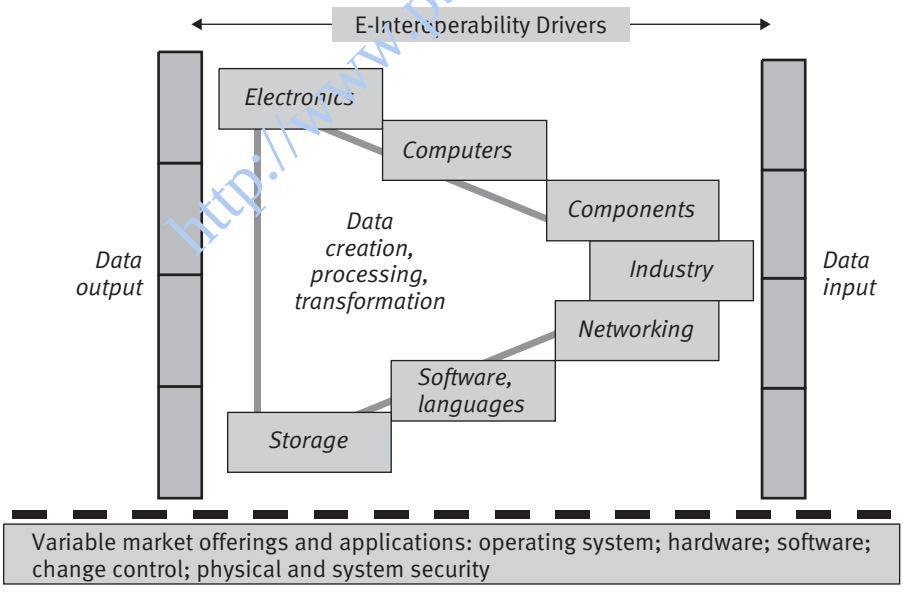
Although adoption of new technology depends on the successful integration of a variety of components, it is clear that components do not evolve at the same rate. What does this mean to the healthcare industry?

Exhibit 1.1 demonstrates the categories that should be identified in the scope of auditing an information infrastructure.

From an information perspective, the auditors' assessment should include questions that help identify the current electronic infrastructure of electronic information communications. For example, a checklist of questions might include:

- ❑ Identify the current electronic infrastructure of information communications.
- ❑ Identify what computer tools are being used to communicate information.
- ❑ Identify what components are currently being used.
- ❑ Identify the process flow of the network.

EXHIBIT 1.1 **INFORMATION CONTINUUM (IC)**



Source: MBA Inc. (www.mbanews.com; copyright 2007).

- ❑ What software and languages are we currently using to communicate information?
- ❑ What types of storage devices do we use?

For each item in the checklist, auditors should understand *why* the designated tool is used, *where* the tool is maintained, *how* the tool is implemented, and *whether* the tool uses the most appropriate framework and structure, to determine whether the information extrapolated from an e-audit will meet the standards of sufficiency and relevancy.

Information Technology Considerations

Auditing the systems and processes of an organization that utilizes information technology requires a general understanding of its technological components. In addition to a *subject matter expert*, a successful audit team will need to adopt someone who has an appropriate understanding of technological components such as operating systems, hardware, software, change or version control activities, and security devices.

An operating system is the software that allows the computer to run and process information on behalf of its user. Examples include Windows, Unix, Linux, and the Mac OS. An operating system therefore enables users to run various applications, such as an electronic healthcare record to manage information about a patient's care. Within the scope of any audit, it is important to recognize which operating system an organization uses. Your audit at minimum should include compliance with maintenance and software update requirements to help ensure the integrity of the infrastructure.

Four types of hardware exist: mainframes, servers, minicomputers, and personal computers. The *mainframe*, the original computer, is powerful and tends to connect to numerous terminals and peripheral devices. *Servers* provide infrastructure connecting the mainframe to other computer systems. These types of electronic system arrangements often include both hardware and software applications. In other words, any electronic system within any organization will include the use of hardware and software. Servers tend to serve a smaller network of users. *Minicomputers* (bigger than desktops and smaller than mainframes) are a setup of workstations that can run on a desktop and sometimes serve as a central

computer for smaller organizations. *Personal computers* and *laptops* either function and stand alone or are configured for access to a defined network. Due to advances in technology, desktop personal computers can now outperform mainframe infrastructures.

Many different types of software and applications exist, and a working knowledge of the software used by the organization being audited is necessary. When looking at a personal healthcare record, consider the dynamics of merging different sources of information. *It is the process of identifying each source document and the type of software and application that is housing the information. This will be important in testing the ability for the information to be integrated.* The audit may find that some systems are not compatible with others.

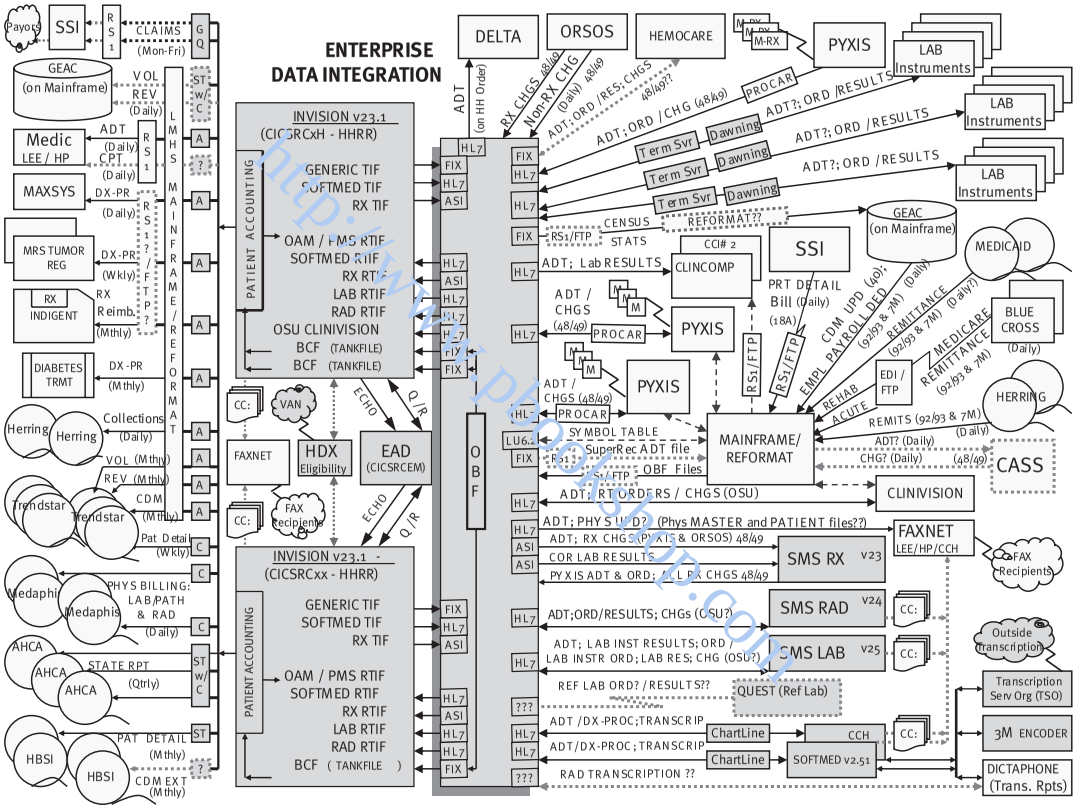
Adequate controls of information technology, security measures including virus protection and firewalls, audit trails, quality assurance, and provisions for emergency changes, sourcing, and general tracking of all end-user activities will be discussed in more detail in a later chapter.

E-health initiatives accumulate databases comprised of sensitive information. These databases can be *flat* or *relational*. Flat databases incorporate all information elements into one source, whereas relational databases link a series of databases containing different information elements. How databases use and store information deserves significant attention due to privacy concerns.

Other information technology developments that require attention include e-commerce, electronic funds transfer (EFT), and enterprise resource planning (ERP). E-commerce involves conducting commercial activities over the Internet. EFT is the way electronic payments are made in e-commerce. E-commerce has become prevalent in many industries. The airline industry, for instance, is quickly developing into a virtual-world activity since the need for in-person transactions is almost obsolete. As various components of healthcare move in this direction, specific concerns will follow with respect to the extent that patient needs can and should be addressed in a virtual world.

Enterprise resource planning software is the heart of what is happening in e-health. ERP is the art of taking the entire information infrastructure from each department and their respective functions and integrating them into one system. Exhibit 1.2 illustrates the data map for one hospital. Each component electronically is operating independently from all others. Thus the task of integration requires careful planning; otherwise,

EXHIBIT 1.2 **SAMPLE SEGMENTED DATA MAP OF A 250-BED HOSPITAL**



Source: MBA Inc. (www.mbanews.com; copyright 2007).

the risk of losing information and developing inefficiencies, and the general risk of patient care can occur with disconnect of information flow. Unfortunately, ERP planning is a concept that has the least amount of controls. The risk can be a complete system failure with major disruptions to the operations of the enterprise.

The auditor role is often missing during any type of ERP planning or transition. The auditor role appears on the scene after the implementation of the new system. Auditors can play a critical role during the design and prior to the purchase of the new system. They can ask critical questions from an internal control perspective regarding the computer, the software, and the hardware to be utilized. In addition, they can test to see whether the new system will meet all the post-audit information requirements in order to be compliant with any regulatory or industry market expectation.

Numerous e-health system audit considerations are incorporated throughout this book. In addition to developing a comprehensive operational audit checklist, it is important to develop the appropriate *people list*. For example, it is important to develop a multidisciplinary team of users. End-user acceptance and use is critical. However, experience has shown that all possible users are not sufficiently defined. The omission often results in new vulnerabilities and significant cost overruns. For example, at a 500-bed facility, the statistician and financial planners were not included on the front end during discussions of system design and their specific user requirements. Once the new system was up and running, they were scheduled for training.

During the training session, it was quickly realized that tracking information to measure revenue by department was not included in the system design. In essence, the facility lost its ability to monitor various service charges. The statisticians and financial planners should have been included in the review of the new system design. In essence, a questionnaire of all front- and back-end users should be included to ensure that the new system will incorporate the information needs of all users of the system.

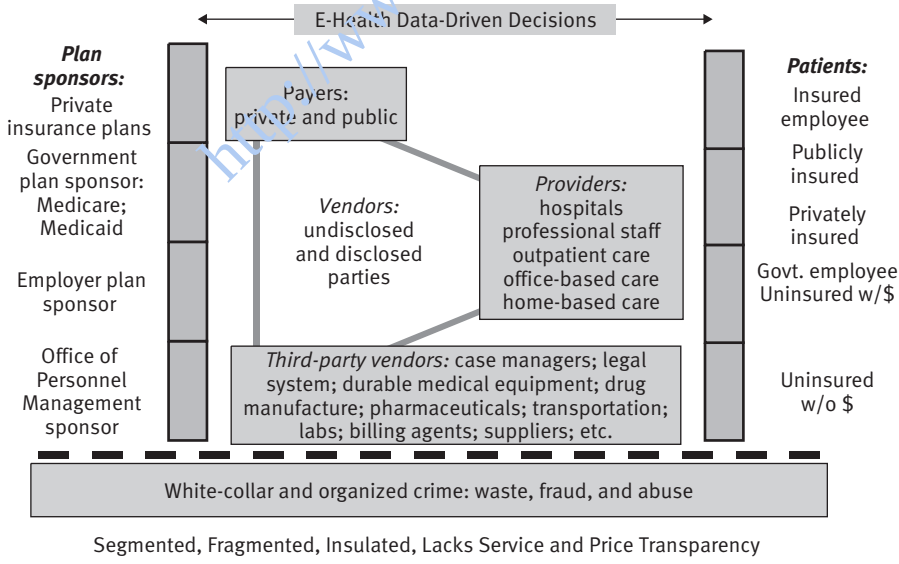
How Is Health Information Created?

Health information is the by-product of any and all activities that can occur within a healthcare episode. It is generated by the individuals and entities within the healthcare continuum and is communicated verbally and via paper, facsimile, and electronic avenues.

My previous publication, *Healthcare Fraud Audit & Detection Guidebook*, introduced the market players in the HCC to identify each party's involvement in the provision of direct and indirect patient care. Just as it is critical to understand the movement of financial and health information throughout the continuum to detect waste, fraud, and abuse, this understanding is also important when auditing the content and infrastructure of any e-health system. Exhibit 1.3 reflects the movement of a single health episode through one or more parties.

The parties above the dotted line in Exhibit 1.3 are considered legitimate market players; the illicit market players (white-collar and organized crime) lie below the dotted line. The figurative separation demonstrates that criminals seek opportunities to penetrate the normal flow and movement of a healthcare episode and that fraud can occur within a single market player or as a collusion scheme with one or more parties. Auditors should take into consideration that the market is segmented, fragmented, and at times insulated from other members of the

EXHIBIT 1.3 **PRIMARY HEALTHCARE CONTINUUM MARKET PLAYERS**



Source: MBA Inc. (www.mbanews.com; copyright 2007).

primary healthcare continuum. With respect to auditing e-health clinical information, it is important to understand the following:

- What e-health information is being generated?
- Why is the information being generated?
- Where is the information being stored?
- Who is using the information?
- How is the information being used?

The integrity of any e-health information infrastructure depends on the ability to answer these clinically related questions.

With respect to auditing e-health financial information that often lacks price (the actual cost) and service (the actual treatment or product) transparency, it is important to understand the following:

- What fees are being generated for the service or product provided?
- Why are the fees structured in the format presented?
- Where are the fees being processed and stored?
- Who is making the financial determinations?
- How are third parties getting paid and what are their fees?

The integrity of any e-health information infrastructure also depends on the ability to answer these financially related questions.

Review of Primary HCC Market Players

Patients

At the primary level of the healthcare continuum, patients are classified from a financial and clinical perspective. A patient is a party who is a recipient of health services. Within the healthcare continuum, patients are first labeled by their financial status. A patient may be financially classified as an "insured employee," "privately or publicly insured," "uninsured with financial assets," or "uninsured without financial assets." Patient financial status sets the tone for how patients will be handled from day one of a healthcare episode and impacts what offerings other members of the healthcare continuum will make available to them. The effect of a patient's financial status on a healthcare episode will be discussed in further detail in Chapter 3. For now, identifying the

concept and discipline of financial case management is enough. *Financial case management* is the discipline of creating a financial plan to meet the patient's healthcare needs. A clinical case management plan focuses only on the healthcare needs of the patient. The market should recognize each discipline as a separate function. From an auditor's perspective, remember to take into consideration the contractual and financial incentives that occur naturally in the marketplace.

From the patient's perspective, the other activity occurring during a healthcare episode is clinical case management (CCM). *Clinical case management* includes current healthcare initiatives and past treatment regimes. It will also be discussed in further detail in Chapter 3. Considerations for an e-health environment should take into account both financial and clinical market activities.

Providers

A provider is any clinical setting and professional staff that designs, implements, and/or executes any healthcare initiative. Healthcare initiatives may be part of a wellness or an illness program, and can be preventive in nature. An initiative may overlap into the secondary healthcare continuum when a patient and provider participate in research-related activities for clinical treatment.

Third-Party Vendors

The category of *third-party vendors* in Exhibit 1.3 consists of a large group of diverse market players. For instance, both durable medical equipment and pharmaceutical vendors fall into this broad category. Third-party vendors also include transportation services that move patients to and from treatment centers. Entities in this category generally support the treatment regimen designated by the provider and carry out necessary supplemental functions in the provision of care by providers.

Payers

A *payer* as illustrated in Exhibit 1.3 is an entity that processes the claims payment transactions of healthcare episodes. Payer systems are also

referred to as *third-party administrators* (TPAs). TPAs administer health plan programs on behalf of plan sponsors. A *plan sponsor* in essence is an entity that funds a health program. Exhibit 1.3 illustrates several different types of plan sponsors. Private insurance companies, for example, take a calculated risk by collecting premium payments from a group of individuals. They take the risk that the total amount of premiums collected will be below the cost of healthcare claims paid out. For instance, BCBS associations may sell an insurance plan in which they take the risk. The insurance company will adjudicate the claims based on its insurance plan program. Many insurance companies also act as TPAs and self-administer claims on behalf of other plan sponsors. They sell TPA services in which the self-insured employer takes on the "risk." The role in this example of BCBS would be to process and adjudicate the claims for its self-insured client.

The federal government–sponsored program Medicare contracts out the function of processing and adjudicating claims to a TPA. This TPA processes and adjudicates claims based on program rules on behalf of Medicare's beneficiaries. Another federally sponsored and state-managed benefit plan is Medicaid. Medicaid programs are state run with their own specific program rules. They may contract out the processing and adjudication of claims to a TPA vendor, or some states may process them internally. Patients associated with this type of program are referred to as *recipients*.

The private employer will either purchase an insurance program or choose to provide healthcare benefits to its employees but remain self-insured. In this situation, the employer is choosing to take on the risk. Many employers will hire a TPA to administer their program and process the claims. Again, the idea is that they will be able to keep their costs down. When an employer hires a TPA, it is important to recognize whether the entity is a business entity that functions only as a TPA. The TPA does not sell insurance. This is in contrast to other entities that do have insurance business but also provide TPA services to self-insured employers.

The office of personnel management handles the healthcare benefits for government employees. Just like employers, this office tends to outsource the claims-processing function to a TPA. Therefore, a TPA can have among its clientele private- and public-health-sponsored programs.

Overall, Exhibit 1.3 highlights four typical plan-sponsor profiles. It is important to appreciate that the dynamics are very different. Any audit should take into consideration the contracts between the parties and the respective e-health environment. A clear understanding of what information is exchanged is very important.

Finally, there is the illicit market player categorized as "organized crime." These perpetrators have developed all types of fraudulent schemes in the paper world and have continued in the semi-electronic and paper world of healthcare. As the market moves into the electronic era, expect to evolve new schemes. Internal controls within each legitimate market player will have a critical role in preventing, deterring, and detecting new schemes in the e-health world. The opportunities for effective and rampant schemes are exponential in an electronic environment. However, the opportunities for early detection are just as numerous if careful planning and security are included in any e-health infrastructure. The need to audit controls and appropriate internal guides in e-health requires the development of a second layer of the healthcare continuum. The market players for consideration are referenced in Exhibit 1.3.

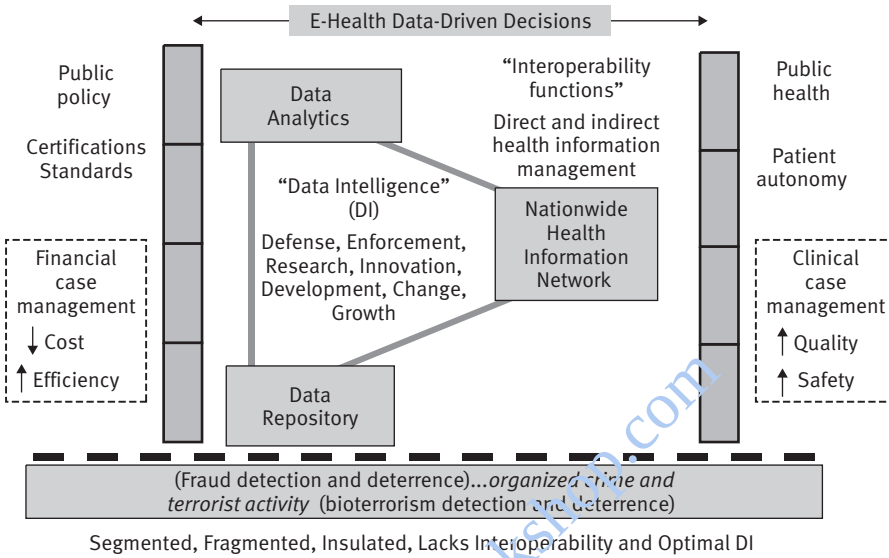
Review of HCC Secondary Market Players

Exhibit 1.4 identifies users of health information in roles outside of direct and indirect patient care activity. They may include research, monitoring, and respective public and private agency work.

The secondary HCC includes the global issues of privacy, security, confidentiality, and integrity. The central point is the generation of data intelligence. Several market players impact the generation of data intelligence. Start on the right of Exhibit 1.4 with *public health*, which is the body of science that focuses on the health and well-being of our communities. Public health involves various activities, such as research, education, prevention initiatives, mitigation initiatives, and surveillance of any developments of adverse conditions. The market has numerous organizations, both public and private, dedicated to this science.

The Centers for Disease Control (http://www.cdc.gov), a government-sponsored agency, has as its mission "To promote health and quality of life by preventing and controlling disease, injury, and disability," leading

EXHIBIT 1.4 **SECONDARY HCC MARKET PLAYERS**



Source: MBA Inc. (www.mbanews.com; Copyright 2007).

with the vision for "Healthy People in a Healthy World—Through Prevention." The key issue of prevention can be maximized with aggregating health information. The ease of processing large amounts of information within a time frame for optimal impact of such information can occur in an electronic environment.

Another example of an organization focused on public health is the American Public Health Association. This organization dates back to 1872 (http://www.apha.org/). The focus of this group is on the health and welfare of communities along with preventing serious threats. The HCC in Exhibit 1.4 continues with the concept, following public health with *patient autonomy*. The healthcare marketplace is faced with many economic as well as data-access issues. The key objective of patient autonomy is to create an environment in which patients have control. This control can occur only if they have access to their own health information. Electronic aggregation of each individual's health records will lay the groundwork for achieving that goal.

The concept of *CCM* is the separation of clinical initiatives and recommendations from any financial aspect of our patients. Clinical case management calls attention to providing independent clinical decision making that is not impacted by any financial factors. This body of science should be developed independently of any financial plan associated with the patient. This leads us to *quality assurance*. This market initiative needs to continue in the form of research, continued studies, data-driven technologies, and monitoring of patient outcomes. *Safety* follows, and is integrated throughout the healthcare continuum. Standards on this subject can be found throughout the marketplace. For example, the Joint Commission (since 1910) on accreditation of hospitals incorporates minimum standards of performance in this area in order for hospitals to receive their accreditation. A more recent organization, the National Patient Safety Foundation, was founded in 1997. Their mission is to improve the safety of patients.

Recent developments in e-health have generated the efforts of the Nationwide Health Information Network (NHIN). This is a Department of Health and Human Services initiative. It has set the following as its goals (http://www.hhs.gov/healthit/healthnetwork/background/):

- Developing capabilities for standards-based, secure data exchange nationally
- Improving the coordination of care information among hospitals, laboratories, physicians' offices, pharmacies, and other providers
- Ensuring appropriate information is available at the time and place of care
- Ensuring that consumers' health information is secure and confidential
- Giving consumers new capabilities for managing and controlling their personal health records as well as providing access to their health information from electronic health records (EHRs) and other sources
- Reducing risks from medical errors and supporting the delivery of appropriate, evidence-based medical care
- Lowering healthcare costs resulting from inefficiencies, medical errors, and incomplete patient information

- Promoting a more effective marketplace, greater competition, and increased choice through accessibility to accurate information on healthcare costs, quality, and outcomes

Any involvement on the subject of e-health should include the monitoring of activities initiated by the Department of Health and Human Services' Health Information Technology initiatives. The Nationwide Health Information Network (NHIH) is setting the stage for an overall data repository from the perspective of the individual patient. The entities within the HCC continuum do have data repositories. However, they tend to be fragmented within their own environment, as illustrated in Exhibit 1.3. Issues of segmentation are found within internal structures and external communications with other entities in both the private and public user marketplace. The future of an interoperable environment will drive data analytics and the generation of data intelligence.

The activities that run parallel on the left side of Exhibit 1.4 begin with *public policy*. Public policy is the set of policies that form the foundation for public law. Much of public policy is generated from the common conscience. For example, the progressive impact of white-collar crime within corporations and the subsequent response of the common conscience initiated public laws such as Sarbanes-Oxley. The HCC continues with *certifications* and *standards*. These activities in e-health specifically are being addressed by initiatives by the Department of Health and Human Services' Health IT activity, as well by numerous other nonprofit professional organizations. Some of these initiatives will be discussed in a later chapter.

Parallel to clinical case management (CCM) is *financial case management* (FCM). In a later chapter, details of this concept will be reviewed further. The market does not formally separate clinical from financial decision making on the management of illness and wellness initiatives. In essence, patients should receive an evaluation from their provider of the most appropriate care (CCM). A separate report and analysis should address the financial picture along with benefit provisions that are available for the treatment options presented (FCM). Separating financial from clinical decisions during the aggregation of health information within any electronic system will provide valuable data-driven opportunities. Most important, it will provide the consumer with clear, independent decision

making. This creates an environment in which true patient autonomy and empowerment can exist. The combination of these efforts will decrease cost and increase efficiency, quality, and patient safety. An interoperable e-health environment will promote data intelligence leading toward direct and indirect health information management.

The users in the secondary healthcare continuum along with the primary healthcare continuum have the opportunity to create a truly data-driven market through an interoperable e-health environment. The key component is the data-driven aspects that e-health can provide to these secondary users. Their work product will ultimately feed back into the market players in the primary healthcare continuum. In the primary HCC, data-driven health information models can drive both clinical and financial decision making. The results of these decisions in turn feed into the secondary healthcare continuum. The two forums are contemporaneous as well as reactive and responsive to the respective parties. Exhibit 1.5 provides a sample listing of HCC user activities.

Exhibit 1.6 provides a sample of key questions that should be asked in any e-health environment or among any of the market players involved in the primary or secondary HCC.

Major Initiative for E-Health

The Department of Health and Human Services has been taking steps toward the development of a truly interoperable environment. The key information source to monitor is the "Health Information Technology" home page that can be found at http://www.hhs.gov/healthit/.

In May 2007, the Health Information Technology (Health IT) source indicated several goals for Health IT initiatives. The mandate is to promote comprehensive management of health and medical information and to "secure the exchange between healthcare consumers and providers." Health IT will impact the following areas:

- Improve healthcare quality.
- Prevent medical errors.
- Reduce healthcare costs.
- Increase administrative efficiencies.
- Decrease paperwork.
- Expand access to affordable care.

EXHIBIT 1.5 **SAMPLE E-HEALTH PRIMARY AND SECONDARY HCC USER ACTIVITIES**

- ✓ Patients: Individuals who are trying to manage their own health or that of a loved one.
- ✓ Providers: Professionals and facilities establishing the most appropriate environment and means to serve their patients.
- ✓ Payers: Providing claims management services.
- ✓ Employers: Providing healthcare benefits.
- ✓ Government employees/investigators: Government programs have added significantly to their staffing to address initiatives for creating an electronic environment for all health records and transactions. How to audit in the e-health marketplace will be part of most compliance initiatives, investigations, and enforcement.
- ✓ Higher education: In response to all types of fraud- and e-health-related issues, upper graduate programs are being developed to provide degrees or certifications in this area. Healthcare is an offering academics are trying to develop as a subspecialty. The e-health network is providing greater sources of research material to develop outcome-data-driven clinical decision-making programs.
- ✓ Health attorneys have litigation activity throughout the healthcare continuum. Understanding how to audit in the e-health world will impact how cases are litigated and how various subject matters are addressed.
- ✓ Internal audit groups will be impacted by developing new skill-set offerings in order to audit in a wide range of operational areas, from workers' compensation management to employee health information to the internal controls of drug manufacturers' operational delivery systems of each identified market player.
- ✓ Fraud examiners will be impacted by e-health environments, and in particular with data-retrieval issues.
- ✓ Consulting firms will be impacted by significant opportunities for data analytics and data intelligence offerings in the e-health environment.
- ✓ Provider systems: Case managers' skill-set offerings for auditing e-health.
- ✓ Payer systems: Case managers' skill-set offerings for collecting e-health information; managing health information as well as auditing their e-health systems.
- ✓ Employers: Case managers focus workers' compensation on managing e-health issues with information received, maintained, and generated.
- ✓ Life care planners: Skill-set offerings; considerations for managing e-health information.

EXHIBIT 1.6 **SAMPLE E-HEALTH PRIMARY AND SECONDARY HCC E-HEALTH ISSUE**

- ✓ What is it using the information for?
- ✓ Why is it being used?
- ✓ Where is the information being stored?
- ✓ Who has access to the information?
- ✓ How is it being used?

This initiative targets the concept that interoperable Health IT will improve individual patient care, but it will also bring many public health benefits, including:

- Early detection of infectious disease outbreaks around the country
- Improved tracking of chronic disease management
- Evaluation of healthcare based on value enabled by the collection of de-identified (data that excludes the identity of the patient) price and quality information that can be compared

The primary discussions generated from the inception of Health IT initiatives center around the belief that health information technology is an effective tool to help individuals maintain their health through better management of their health information. The initiatives under this program will help consumers gather all of their health information into one place. This will allow the opportunity to understand its content. This type of control will allow patients to share information securely with their healthcare providers. The ultimate goal is that it will help patients get the care that best fits their individual needs. Overall, the Health IT initiatives will help improve public health. The model is to build partnerships between consumers and providers across the country one relationship at a time.

Audit Implication Overview

This chapter provides a market overview on several separate fronts. First is the introduction of e-information and e-health. Next is a historical overview of technology. Technology goes hand in hand with any discussion

of e-information and any e-health framework. Exhibit 1.1 graphically represents the major areas to incorporate when reviewing a particular market player. This is the actual delivery of healthcare products and/or services along with their financial management. Exhibit 1.2 illustrates a sample fragmented data map of one entity. Exhibit 1.4 represents the contract and information world that functions separately and overlaps with the components of Exhibit 1.3. Auditing in e-health is about taking Exhibit 1.1 and identifying the applicable IC dynamics within each market player or within their communication relationships among one or more parties. This exact same concept overlaps into the market players of the Primary Healthcare Continuum (Exhibit 1.3) and the Secondary Healthcare Continuum (Exhibit 1.4). This is vital for the integration of technology into our information continuum. The next chapter continues with concepts of industry applications and their impact on the audit process.

ENDNOTES

1. David L. Sackett, Sharon E. Straus, W. Scott Richardson, William Rosenberg, and R. Brian Haynes, *Evidence-Based Medicine: How to Practice and Teach EBM*, Third Edition (Edinburgh: Churchill Livingstone, 2005).
2. Historical information compiled from the Computer History Museum (http://www.computerhistory.org).
3. Ibid.