



InterNuntius Academe Presents:

Executive Summary
on the future of
Technology and Service Infrastructure
For the
Health Care Industry

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Disclosure:

The purpose of this paper is to provide information on changes taking place in the health care industry. It is not the intent of the author to promote, criticize, or single out any particular service, product, technology or company.

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Introduction

Health care organizations are undergoing a significant transformation to unify and improve the quality of health services. Two primary drivers fuel this transformation: First, the current health market is in constant flux, defined and redefined by new advances in products and services. This shifting in the market creates unparalleled opportunity for savvy health care organizations to maximize profitability. Second, the U.S. Government is taking a leadership role in establishing a framework to enable consumer decision-making, and to streamline the sharing of health information between discrete health organizations in the provision of quality health services.

At the foundation of these transformational changes is an integrated infrastructure known as the Federal Health Architecture (FHA), which has spawned additional initiatives, including Health Information Technology or HIT. In the report, *Crossing the Quality Chasm*, the Institute of Medicine (IOM) identified health information technology as one of the most significant tools available to improve healthcare quality. Further, the IOM, the National Committee on Vital and Health Statistics, and the President's Information Technology (IT) Advisory Committee have also recommended the development of a National Health Information Infrastructure to help improve safety, to reduce costs, and to enhance the quality of healthcare.

In July 2004, the U.S. Department of Health and Human Services published *The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care: Framework for Strategic Action*.¹ The stated goal of this 10-year plan is to transform the delivery of health care by building a new health information infrastructure, including electronic health records (EHRs) and a new network to link health records nationwide.

To capitalize on the changes in the health care market, organizations must:

1. Gain an understanding of the Federal Health Architecture (FHA), and the Health Information Technology (HIT) initiatives;
2. Gain insight on how organizations in the health industry are implementing HIT initiatives; and
3. Evaluate the organization's position in the market and identify organizational capabilities for providing products and services for these emerging opportunities.

¹ David J. Brailer, MD, PhD, National Coordinator for Health Information Technology, "The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care – Framework for Strategic Action," July 21, 2004.

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Federal Health Architecture (FHA)

Before a health care organization can utilize FHA to identify products and services for the market, an understanding of the goals and vision of FHA is needed. This section summarizes FHA and outlines the goals and vision of the architecture framework.

FHA is a multi-departmental business and technical architecture that facilitates:

- Identification of collaborative business opportunities that leverage existing efforts and investments
- Development of a performance measurement and outcome strategy
- Adoption of technical and data standards
- Development of specifications for how to implement those standards

FHA utilizes a process that promotes:

- Commitment to the use of standards
- Commitment to participating in development and implementation of specifications

FHA Goals:

- Improved coordination and collaboration on government Health IT solutions and investments
- Improved efficiency, standardization, reliability, and availability of comprehensive health information solutions.

Potential Opportunities of FHA:

- Complete and publish an enterprise architecture that facilitates interoperability leveraging Consolidated Health Informatics (CHI) and other data standards, software development standards, high security model, technical infrastructure standards;
- Immediately begin integration of HHS and other Dept's overlapping application and data systems, starting with business process and data standards;
- Target high priority business lines for developing collaborative technology solutions;
- There is the potential to reduce development costs by challenging private technology firms to develop applications compliant with the published architecture, ready for use by the government and by healthcare providers and manufacturers;

Federal Enterprise Architecture (FEA) and FHA Alignment

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Health Information Technology (HIT)

As a component of FHA, the Health Information Technology framework is a strategic framework consisting of four (4) major goals, comprised of three (3) strategies for reaching those goals. The following section outlines the HIT goals and strategies for achievement.

Strategic Framework and Goals of HIT Initiatives²

- **Goal 1: Inform Clinical Practice.** Informing clinical practice is fundamental to improving care and making health care delivery more efficient. This goal centers largely around efforts to bring EHRs directly into clinical practice. This will reduce medical errors and duplicative work, and enable clinicians to focus their efforts more directly on improved patient care. Three strategies exist for realizing this goal are:
 - *Strategy 1. Incentivize EHR adoption.* The transition to safe, more consumer friendly and regionally integrated care delivery will require shared investments in information tools and changes to current clinical practice.
 - *Strategy 2. Reduce risk of EHR investment.* Clinicians who purchase EHRs and who attempt to change their clinical practices and office operations face a variety of risks that make this decision unduly challenging. Low-cost support systems that reduce risk, failure, and partial use of EHRs are needed.
 - *Strategy 3. Promote EHR diffusion in rural and underserved areas.* Practices and hospitals in rural and other underserved areas lag in EHR adoption. Technology transfer and other support efforts are needed to ensure widespread adoption.

- **Goal 2: Interconnect Clinicians.** Interconnecting clinicians will allow information to be portable and to move with consumers from one point of care to another. This will require an interoperable infrastructure to help clinicians get access to critical health care information when their clinical and/or treatment decisions are being made. The three strategies for realizing this goal are:
 - *Strategy 1. Foster regional collaborations.* Local oversight of health information exchange that reflects the needs and goals of a population should be developed.
 - *Strategy 2. Develop a national health information network.* A set of common intercommunication tools such as mobile authentication, Web services architecture, and security technologies are needed to support data movement that is inexpensive and secure. A national health information network that can provide low-cost and secure data

² Brailer, Framework for Strategic Action.

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movement is needed, along with a public-private oversight or management function to ensure adherence to public policy objectives.

- *Strategy 3. Coordinate federal health information systems.* There is a need for federal health information systems to be interoperable and to exchange data so that federal care delivery, reimbursement, and oversight are more efficient and cost-effective. Federal health information systems will be interoperable and consistent with the national health information network.

➤ **Goal 3: Personalize Care.** Consumer-centric information helps individuals manage their own wellness and assists with their personal health care decisions. The ability to personalize care is a critical component of using health care information in a meaningful manner. The three strategies for realizing this goal are:

- *Strategy 1. Encourage use of Personal Health Records.* Consumers are increasingly seeking information about their care as a means of getting better control over their health care experience, and PHRs that provide customized facts and guidance to them are needed.
- *Strategy 2. Enhance informed consumer choice.* Consumers should have the ability to select clinicians and institutions based on what they value and the information to guide their choice, including but not limited to, the quality of care providers deliver.
- *Strategy 3. Promote use of telehealth systems.* The use of telehealth – remote communication technologies – can provide access to health services for consumers and clinicians in rural and underserved areas. Telehealth systems that can support the delivery of health care services when the participants are in different locations are needed.

➤ **Goal 4: Improve Population Health.** Population health improvement requires the collection of timely, accurate, and detailed clinical information to allow for the evaluation of health care delivery and the reporting of critical findings to public health officials, clinical trials and other research, and feedback to clinicians. Three strategies for realizing this goal are:

- *Strategy 1. Unify public health surveillance architectures.* An interoperable public health surveillance system is needed that will allow exchange of information, consistent with current law, between provider organizations, organizations they contract with, and state and federal agencies.
- *Strategy 2. Streamline quality and health status monitoring.* Many different state and local organizations collect subsets of data for specific purposes and use it in different ways. A streamlined quality-monitoring infrastructure that will allow for a complete look at quality and other issues in real-time and at the point of care is needed.

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- *Strategy 3. Accelerate research and dissemination of evidence.* Information tools are needed that can accelerate scientific discoveries and their translation into clinically useful products, applications, and knowledge.

Vision for Consumer-centric and Information-rich Health Care³

FHA sets an overarching vision for improving the quality, safety, and service of health care, and also for using health care resources more efficiently. The key to realizing this vision lies in creating a consumer-centered, outcome focused, information rich strategy, which provides health care consumers with access to information required for good decision-making whenever and wherever care is provided.

Other Traits of Consumer-centric Health Care

- Portability, information follows the consumer
- Readily Available information (to consumer and physician) such as past medical history, laboratory results, radiographs, and current diagnoses, as well as history of medications and treatments
- Sophisticated decision-support tools that help identify treatments that are best suited to a given patient
- Medications ordered with computerized systems that eliminate handwriting errors and automatically check for doses that are too high, too low, or at risk of causing harmful interactions with other drugs.
- Prescriptions checked against the health plan's formulary; Out-of-pocket costs of the prescribed drug would be compared with alternative medications.
- Fewer medical errors
- Up-to date information on patients
- Less variation in care.
- Consumer access to physician comparison information regardless of geographic location, socioeconomic status, disease condition, or disability.
- Culturally sensitive health care
- Emphasis on timely access to specialists and enhanced clinical decision support so that no consumer or family would experience unnecessary delays in access to care.
- Care delivered electronically as well as in person. Telemedicine to enhance access to the best specialists when needed for a specific disease or treatment.
- Protection of medical records from unauthorized access.

³ Brailer, Framework for Strategic Action.

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Over the past three years, many communities, hospitals, clinicians, and consumer groups have taken the initiative and demonstrated breakthroughs in improving the health care system. In these communities, even at this early stage, the process of health care is being modernized – and the experiences of both clinicians and consumers are better because of the changes. Here are some examples:

- When arriving at a physician’s office, a new patient does not have to enter his or her personal information, allergies, medications, or medical history, since this information is already available.
- Medical records and x-rays on a key chain drive that plugs into a USB port on a computer.
- Secure network for private consultations between consumer and physician avoiding unnecessary visits to emergency room and/or office visit
- Computerized prescription, where potential allergies and contraindications are shown immediately, and managed care authorization occurs instantly.
- Specialist remote monitoring of intensive care units in several different hospitals, providing coverage 24 hours a day, 7 days a week, reducing mortality, length of stay, and total cost of the ICU stay.
- A small number of cases of an unusual, sudden-onset fever and cough are instantly reported to public health officials from area emergency rooms, alerting authorities of a possible disease outbreak.
- Standardized health assessment offered via a personal digital assistant device and sent electronically to a central database, where it will be available for review and ongoing care in the decades to come by DoD and VA medical providers.

Automation of the health care industry through widespread use of HIT is a unique means of improving quality and reducing costs at the same time. HIT is also critical to transforming how health care is delivered. HIT has the potential to allow a real market to develop that would reward innovations in care delivery, make the health care system more responsive to consumers, and increase the active involvement of consumers in health and health care.

“HHS is constantly challenged to present integrated information for making management decisions, but we are hindered by not having our vast stores of data pulled together in a comprehensive way.”

US Dept. of Health and Human Services

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FHA Scope

The Federal Health Architecture is designed to be an industry-wide framework. The scope includes virtually every type and category of health organization from consumers, manufacturers, standards organizations, policy makers and regulators, federal, state, and county governments, researchers and labs, hospitals, clinics, physicians, and insurers. More relevant, any organization dealing with health issues will be required to submit and comply with the FHA and HIT architecture and technology standards.

The Diagram below illustrates the makeup of the Federal Health Architecture:

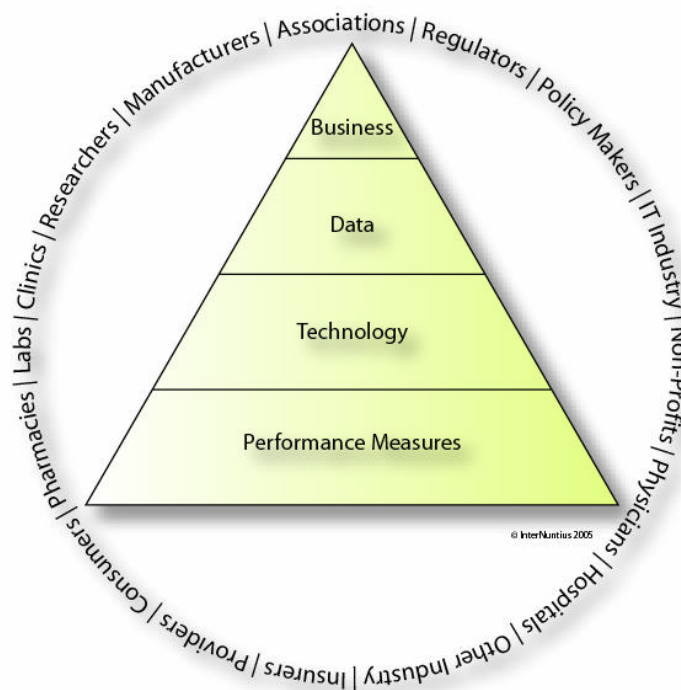


Figure 1 FHA Architecture and Scope

The architecture is made up of four layers. The foundation is built on measuring performance and outcomes. Each health organization will be required to submit quality and performance data to be shared with consumers, the industry, and to the public.

In order to measure performance, a number of technology standards are being developed to ensure quality and consistency. This third layer has resulted in standards which include data, messaging, and technology standards such as HL7, IEEE 1073, ebXML, DICOM, SNOMED, LOINC, and Web Services as well as network systems such as PHIN/NEDSS, eLEXNET, SafetyNet, LEADERS, and EPANET. Together, these

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technology standards, as well as others being developed, will provide the infrastructure necessary to provide detection and monitoring of performance, open communication of health information, and transactional interfaces allowing for interoperability among the health community.

The second layer of the architecture is the data layer. The data layer contains the actual information and data constructs needed by each individual business or health organization. Additionally, the FHA is currently in the process of defining common data frameworks and expanding the requirements from HIPAA and Data Practices. The new data standards will enable the next generation of national health care information to be integrated and shared over the next 10 years.

The top layer of the architecture is the business layer. The business, or more specifically, the performance of the business, is the primary driver of the FHA. In order for FHA to achieve the broad integration, coordination, and participation of the health care industry, the core philosophies of the business must be refocused to an outcome-based, or business performance-based model, oriented around the improvement of health. The new orientation outlined by the FHA requires an alignment between an organization's Performance, Business, Services, Technology, and Data. To assist organizations in making the critical transition to a business performance-driven model, the FHA has outlined five (5) reference models. The reference models focus on aligning business practices and processes to facilitate the implementation and design of an FHA compliant organization.

FHA Reference Models

The five (5) FHA reference models are the culmination of over ten (10) years of Enterprise Architecture (EA) and Business Process Modeling (BPM) integration. In 1993, congress enacted the Government Performance and Results Act (GPRA). The motivation behind the legislation was “to improve the confidence of the American people in the capability of government by systematically holding...agencies accountable for achieving results.” This federal level legislation was the first effort in 80 years to tie government resources to measurable results. In 1996, as a follow-up to GPRA, The Clinger-Cohen Act mandated a federal enterprise IT architecture. The Chief Information Officer's Council responded to this mandate with the Federal Enterprise Architecture Framework (FEAF), a solution based on a framework created by noted enterprise architect John Zachman. The efficacy of this framework is evidenced by the fact that it has been implemented by nearly every federal agency in some form including the U.S. Treasury Department (Treasury Enterprise Architecture Framework -TEAF), the U.S. Department of Interior (Interior Enterprise Architecture – IEA), and the U.S. Department of Health and Human Services (Health and Human Services Enterprise Architecture – HHS EA).

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Enterprise Architecture Framework (EAF) Standards Evolution:

- The Government Performance and Results Act (GPRA) of 1993
- The Information Technology Management Reform Act (ITMRA) of 1996 ("Clinger-Cohen Act")
- The Federal Enterprise Architecture Framework (FEAF) of 1999
- Treasury Enterprise Architecture Framework (TEAF) of 2000
- Federal Health Architecture (FHA) of 2004

The FEAF has been an integral component of the FHA. It forms the foundation of the technology (TRM) and data (DRM) reference models. In addition to the technology and data reference models, FHA has expanded the Federal Enterprise Architecture to include a performance (PRM), business (BRM), and service (SRM) reference models.

The diagram below illustrates the hierarchy of the five (5) reference models:

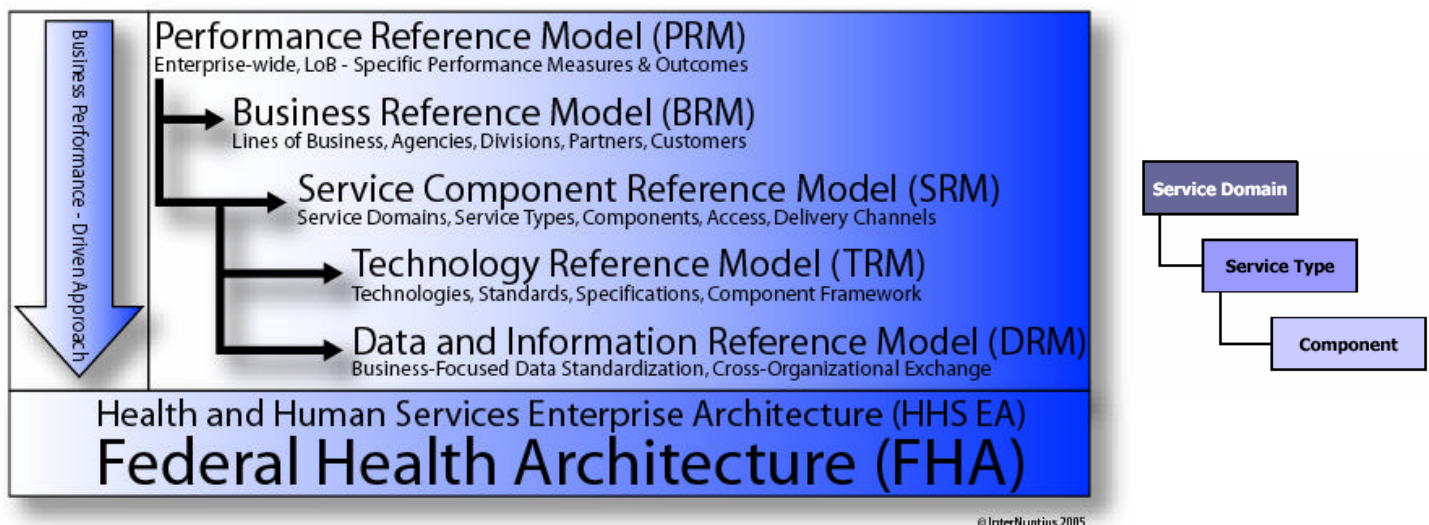


Figure 2 The FEA Reference Model Framework – A Business Performance Driven Approach

Enterprise Architecture Reference Models

Each Reference Model represents one aspect, or one set of components, of the total Health & Human Services Enterprise Architecture (HHS EA) and Federal Health Architecture (FHA). The five models are: the Performance Reference Model (PRM); the Business Reference Model (BRM); the Service Component Reference Model, also known as the Service Reference Model (SRM); the Technical Reference Model (TRM); and the Data and Information Reference Model, also known as the Data Reference Model (DRM). The lowest-level components of the first four listed models are Business Sub-functions (BRM), Performance Indicators (PRM), Service Components (SRM), and Service Specifications (TRM). The DRM is not completed; however, Data-Type Specifications may be one of the smallest components of the DRM.

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Performance Reference Mode (PRM)

The PRM is a "reference model" or standardized framework to measure the performance of major IT investments and their contribution to program performance. The PRM has three main purposes: help produce enhanced performance information to improve strategic and daily decision-making; Improve the alignment-and better articulate the contribution of-inputs to outputs and outcomes, thereby creating a clear "line of sight" to desired results; and Identify performance improvement opportunities that span traditional organizational structures and boundaries. The PRM attempts to leverage the best of existing approaches to performance measurement in the public and private sectors, including the Balanced Scorecard, Baldrige Criteria, Value Measurement Methodology, program logic models, the value chain, and the theory of constraints. In addition, the PRM was informed by current measurements through PART assessments, GPRA, Enterprise Architecture, and Capital Planning and Investment Control. Use of the PRM will populate the model over time. The PRM is currently comprised of four measurement areas: mission and business results, customer results, processes and activities and technology.

Business Reference Model (BRM)

The Business Reference Model is a function-driven framework for describing the business operations of an organization. This model provides an organized, hierarchical construct for day-to-day activities. While many models exist for describing organizations - org charts, location maps, etc. - this model presents the business based on functionalities: Business Areas, Lines of Business, and Sub-functions. These areas represent a departure from previous models that use antiquated, stove piped, business unit-oriented frameworks. The BRM is the first layer of the Federal Enterprise Architecture and it is the main viewpoint for the analysis of data, service components, and technology.

Service Reference Model (SRM)

The Service Component Reference Model (SRM) is a business and performance-driven, functional framework that classifies Service Components with respect to how they support business and/or performance objectives. The SRM is intended for use to support the discovery of enterprise-wide business and application Service Components in IT investments and assets. The SRM is structured across horizontal and vertical service domains that, independent of the business functions, can provide a leverage-able foundation to support the reuse of applications, application capabilities, components, and business services.

Technical Reference Model (TRM)

The Technical Reference Model (TRM) provides a foundation to describe the standards, specifications, and technologies to support the construction, delivery, and exchange of business and application components (Service Components) that may be used and leveraged in a Component-Based or Service-Orientated Architecture. The TRM unifies existing TRMs and electronic Government (e-Gov) guidance by providing a
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foundation to advance the re-use of technology and component services from an enterprise-wide perspective.

Data Reference Model (DRM)

The Data and Information Reference Model (DRM) is being developed. The DRM will describe, at an aggregate level, the data and information that support program and business line operations. The model will aid in describing the types of interaction and exchanges that occur between the Federal Government and its various customers, constituencies, and business partners. The DRM will facilitate collaboration and data exchange between Federal agencies and State and Local entities. The DRM will categorize the government's information along general content areas and decomposes those content areas into greater levels of detail. The DRM establishes a commonly understood classification for Federal data and leads to the identification of duplicative data resources. A common data model will streamline the processes associated with information exchange both within the Federal government between the government and its external stakeholders.

Using the Reference Models

The reference models provide a way to identify an organization's systems, services, lines of business, and performance measurement. Items are identified and decomposed into components defined in the five Reference Models, the Health & Human Services Enterprise Architecture (HHS EA) and the Federal Health Architecture (FHA). Using this information, organizations "score" baseline, yielding potential areas of improvement. The organization can then use the HHS EA's Component Registry to determine whether the components from the target architecture are already available at another office or agency, thus possibly reducing duplication of effort and related costs.

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Applying FHA in the Marketplace

FHA, and the related reference models, provides a basis for establishing the architectural framework necessary for operating in the health care industry for the next 10 years. Equally important, the progress made through the conception and development of the FHA identifies key opportunities in what InterNuntius calls the Health Service Delivery Chain (HSDC). One of the core-level philosophies embedded into the FHA is the idea that a client's health should be viewed as a continuum of historical data including the following: *health preservation, health preservation services, health events, health services, and health outcomes.*



Health History Continuum

Figure 3 Health Services on the Health History Continuum

FHA and HIT are driving health providers and insurers to reestablish the roles, functions, and services offered along the continuum of client health (initially framed by HIPAA legislation). Various health providers and insurers have begun enhancing the health history continuum services model to include expanded service offerings throughout the continuum.

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Case Studies: How Health Care Providers Are Discovering Opportunities Along the Continuum⁴

Health insurance giant, Aetna, is as a prime example of a health care organization that has expanded role and service offerings through use of health information technology. After losing some \$266 million between 2001 and 2002, Aetna has spent the last 3 years implementing a major strategic objective, which yielded a 6% operating margin in 2003, and a rising pre-tax profit as percentage of sales of 9.3% in the 3rd quarter of 2004. An integral component of Aetna's success has been better data management and the creation of an Executive Information System (EIS). Prior to the initiative, Aetna had been using stale information to make actuarial assumptions about what was happening in health care. Those assumptions, based on stale data, were costing Aetna about \$1 million per day. Aetna went through an extensive process to develop requirements for an integrated planning and performance data reporting system.

Aetna now has a 14-terabyte data warehouse of medical-cost and medical-quality data. The database links performance information to core business operations to create an integrated executive informatics system or EIS. The EIS system gathers performance data about financial P/L, cost trends, customer acquisition measures, claim information, medical-costs, finance, and quality-tracking information. A key function of the EIS is to standardize and reconcile the disparities of how data is tracked and stored between various systems throughout the Aetna organization. Not only is Aetna tracking the performance of clinics, physicians, surgeons, and other healthcare providers, but they also use EIS to track and measure internal performance. Managers now have weekly snapshots of how units are performing and can respond to issues prior to seeing the results from month-end or quarter-end periods.

Aetna looks to the EIS system and data warehouse to identify, among other things, surgeon performance records on health events (including data on the number of complications resulting from the surgeon's performance on specific procedures). In some of its newer insurance plans, Aetna steers members toward better surgeons through incentives such as more generous co-pays. Aetna has found that better performance results in less follow-up care and thus fewer claims. Additionally, Aetna has used their data warehouse to help identify some 160,000 examples of potential medical errors, thereby preventing health events that result in claims.



⁴ David F. Carr, "The Aetna Cure," Baseline February, 2005, Case 155.

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Other Program Examples⁵

The following examples describe other health history continuum products and services being offered by health insurance providers through implementation of FHA and HIT initiatives:



- In August 2004, an insurer began paying primary care physicians at three medical treatment facilities for "web visits" with their patients. A large Eastern Massachusetts doctors' group, and an insurer, are experimenting with doctor/patient e-mail programs. At a hospital, patients can enroll in "Patient Site," an online system that allows them to schedule appointments, look up test results, and e-mail their doctors. The insurance provider only is paying doctors who use a standardized web visit form developed to provide secure online communication.



- A non-profit organization is focused on creating system-wide improvements in care delivery by linking physician payment and performance. This initiative, which includes a consortium of quality partners, health plans, and providers has two current projects underway - Physician Office Link (POL) and Diabetes Care Link (DCL). POL stresses the necessity and value of a HIT infrastructure in a physician's office to promote error reduction and quality improvements. Rewards are based on a physician's use of clinical information systems and evidence-based medicine; patient education and support; and care management. The intent is to establish a HIT infrastructure and link it to improvements in higher quality care. The intent is to test the effectiveness and impact of the HIT infrastructure by using HEDIS measures for patients undergoing treatment of diabetes. These proven measures will help the program assess the success of the POL.

Examples of Federal Funding for Health Initiatives in Minnesota

Several health care organizations in Minnesota have successfully applied for and received federal grants from the HIT or FHA initiatives. In 2004, the Federal Government spent more than \$900 million on IT projects and programs related to HIT and FHA. In 2004, health organizations in Minnesota received a total of \$1.75 million. The following are a sample of federally funded initiatives:

⁵ Brailer, Framework for Strategic Action.

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Title: A Community-Shared Clinical Abstract to Improve Care

Description: Plans the use of IT to enhance communication at care transitions and develops an implementation plan for a community- and patient-shared EMR abstract that will be available at the point of care.

Funding: Year 1 Funding: \$181,202 (Estimated total funding: \$181,202)

Grantee: Fairview Health Services, Minneapolis, MN

Title: HIT Strategic Plan of SW Minnesota Health Providers

Description: Develops a regional health IT strategic plan between 28 healthcare providers including a comprehensive needs assessment of all of the participating organizations, prioritization of needs, identification of health IT solutions to prioritized needs, and development of appropriate implementation plans.

Funding: \$196,274 (Estimated total funding: \$196,274)

Grantee: Granite Falls Municipal Hospital, Granite Falls, MN

Title: HIT-based Regional Medication Management Pharmacy System

Description: Implements an interactive video-conferencing system at rural hospitals to provide continuing education for pharmacist and pharmacy technicians as well as a model for bedside verification of medication administration and medication bar coding; also evaluates structure, process, and outcomes related to improvement of patient safety and more effective patient medication management.

Funding: \$488,785 (Estimated total funding: \$1,374,616)

Grantee: Clouquet Community Memorial, Clouquet, MN

Solid strategic partnerships between insurance providers, care providers, physicians, and other industry partners will be key to capitalizing on new opportunities presented from FHA and HIT initiatives. The business environment created by the Federal Health Architecture (FHA) encourages partnering among health service providers and establishing what InterNuntius calls value-add service networks (VASN).

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Developing VASNs is a key requirement to providing services along the health services delivery chain (HSDC). InterNuntius believes that HSDCs will serve as differentiators of health service organizations in the future. HSDCs leverage existing provider networks and through the use of FHA greatly expand the capabilities and value of a firm's service offerings.

Products to Services Continuum

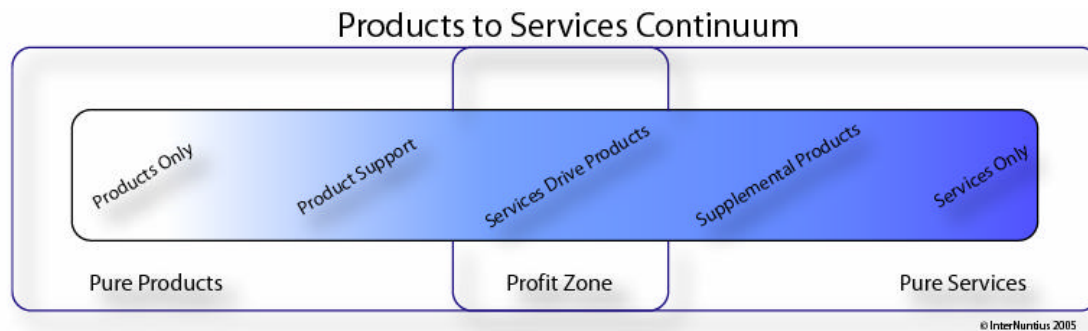


Figure 4 Continuum of Products to Services

The Health Services Industry, like so many industries, has become product focused. The ubiquitous nature of care procedures has had the effect of commoditizing health services. Many health, medical, and surgical procedures are volume-based. A primary indicator of this commoditization is that health services can now be easily “shopped” to find the best price. Another commodity indicator prevalent in the health industry is the standardization of prices and services. Health insurance providers set standard reimbursement rates for health service delivery based on the diagnosis and treatment of health conditions. Many insurance plans stipulate what procedures can be performed in the treatment of a health condition.

Pressure for insurers to provide performance and analytical information from their related care network providers will continue to build over the next three years. Competitive pressure will grow even more intense as insurers like Aetna and UnitedHealthcare begin to pull further ahead of competitors by providing additional services resulting from their Enterprise Architecture capabilities. Health insurance consolidation will increase as health insurance firms struggle to keep up with the heavy infrastructures and technology requirements necessary to implement aspects of FHA and HIT.

Minnesota-based UnitedHealthcare (UHC) provides their members with hospital comparison information on patient volume, unfavorable outcomes, mortality rates, length of stay, and average charges. UHC also provides Computer Physician Order Entry (CPOE) allowing physicians to enter orders and prescriptions on the computer to eliminate errors from hand-written orders. UHC claims to have reduced medication errors by some 88% as a result of CPOE and other initiatives from the Leapfrog Group.

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As competition escalates between care providers in a services-as-products marketplace, the primary challenge for health service organizations is remaining profitable. The answer to profitability lies in operating with the proper mix of products and services. Research indicates that when an organization transitions from a products focus to a services focus, profitability is significantly improved.⁶ In the book, *S-Business: Reinventing the Services Organization*, James Alexander states that top performing service businesses drive sales for products from a pure service offerings perspective. This is illustrated in Figure 4. Top service performers averaged a 61% gross margin and a 30% annual growth rate on their service offerings.⁷ These findings suggest that a major key to profitability is focusing on coordinated service offerings to drive growth.

Marketplace Role

The first step in coordinating service offerings lies in identifying the role an organization desires to play in the marketplace. Health service organizations fall into one of four (4) roles in the marketplace.

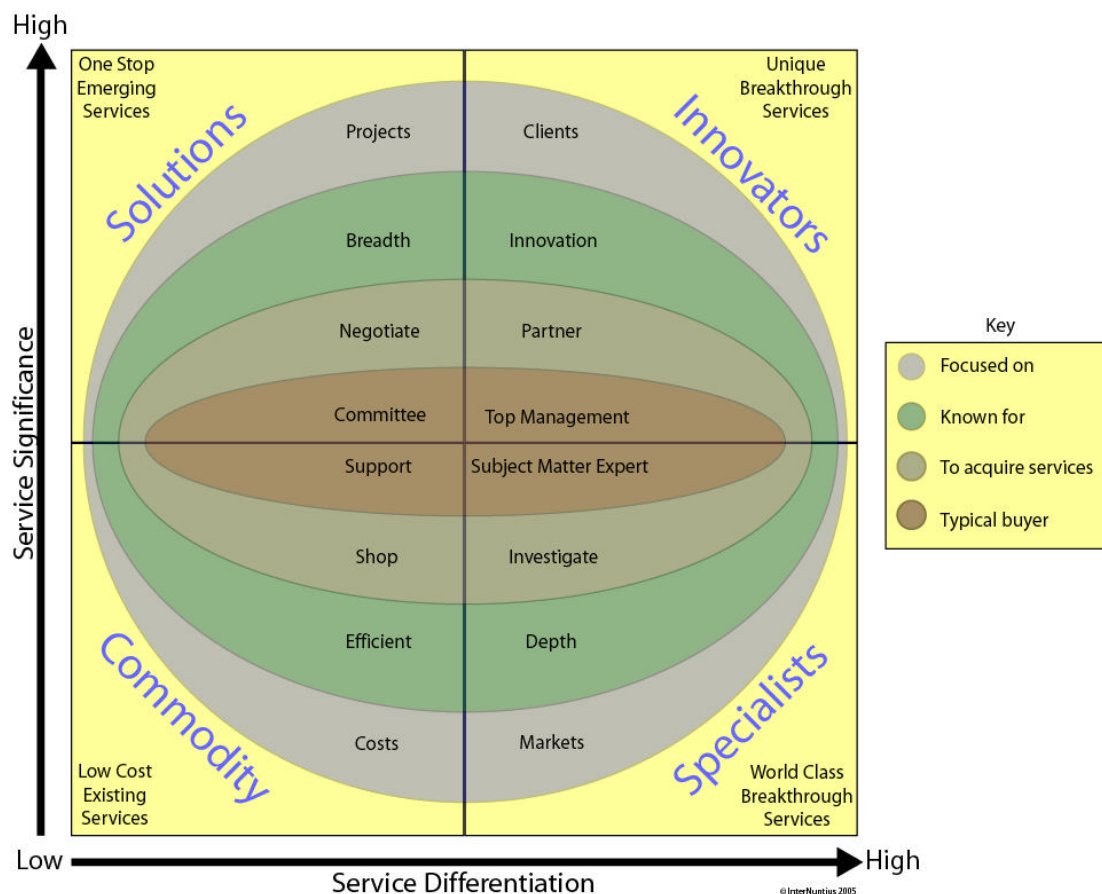


Figure 5 Marketplace Services Matrix

⁶ James A. Alexander and Mark W. Hordes, “S-Business: Reinventing the Services Organization”, Select Books, 2003

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Organizations function as innovators, specialists, solutions providers, or commodity service providers. Figure 5 above, illustrates the four (4) roles a service organization plays in the marketplace. The x-axis (horizontal) of the quadrant depicts the level of service differentiation, while the y-axis (vertical) depicts the significance of the services offered.

Commodity Service Firm

The commodity services quadrant shows firms that provide services that are low in both significance and differentiation. Services provided by firms in this quadrant typically compete based on low costs. Consumers are both comfortable and familiar with these services. Commodity firms are characterized by a focus on cost, pricing, and efficiency. Consumers of commodity services shop to find the firm that offers the lowest or best cost. The typical corporate buyer of commodity services is the support group.

Solutions Provider Firm

The solutions firm provides an integrated services product to their clients. They are focused on full lifecycle solutions, are known for their breadth of knowledge and experience, and provide a single point of contact for a number of commodity and emerging services. Solutions firms must differentiate themselves by providing superior levels of services and solution packaging. Buyers of services from a solutions firm typically prepare an RFP and then evaluate the resulting proposals. Once a solutions firm is selected, negotiation is the key to making a wise purchasing decision.

Specialist Firm

A specialist firm differentiates themselves by providing world-class quality or breakthrough services. Specialist firms are focused on specific markets (vertical or horizontal) and are known for their depth of knowledge and services provided to their market of focus. To acquire services from the specialist firm, a subject matter expert will typically spend time investigating specialist firms to find the best fit.

Innovator Firms

Innovator firms pride themselves on their ability to continuously provide unique or breakthrough services of high significance or value. Innovator firms focus on clients and provide a wide-range of services that are unique and specific to individual clients. They are known for their innovation and their ability to pull together innovative solutions for specific issues faced by an organization. Top management typically hires or recommends the innovator firms and engages them by forming a partnership-style of relationship. Once partnered, the innovator firms retain the relationship for many years and reengage their clients at various levels for specific needs.

⁷ Alexander, 2003, page 27

Role Erosion

While FHA and HIT will provide many benefits for care organizations by encouraging uniform standards and performance measures, the downside of the initiative is a loss of differentiation in the marketplace. The environment created by FHA and HIT will act as an accelerant of role erosion for care organizations that lack a carefully designed strategic plan. However, the opportunities represented by FHA and HIT will offset the effect erosion will play through industry standardization.

Figure 6 below, illustrates how products and services erode into mass-market adoption, standardization, and commoditization.

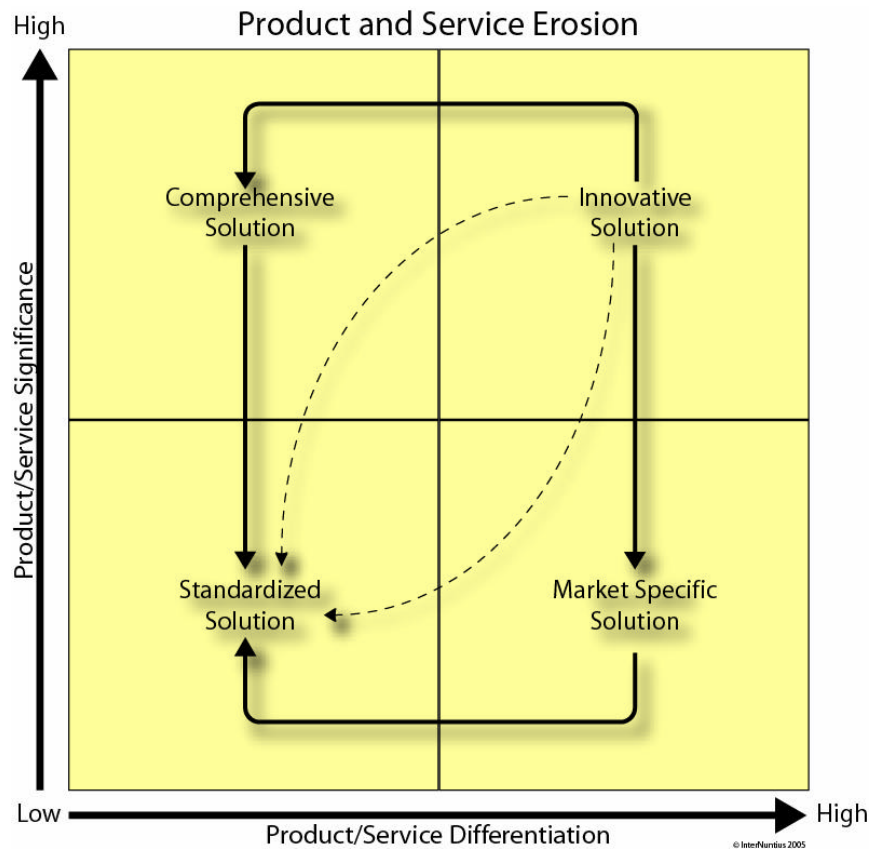


Figure 6 Erosion of innovation to commodity

Conclusion

The Federal Health Architecture and the Health Information Technology initiatives will continue to impact the health care industry in a major way. New performance measures, technology standards, and data practices, are emerging and being implemented in the mainstream health marketplace. Opportunities exist to extend product and service offerings along the Health Services Delivery Chain.

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To capitalize on the changes in the health care market, organizations must develop their strategic capabilities by understanding the impact of FHA and HIT on their organization, gain insight on how competitors are responding, and evaluate their position in the market to identify organizational capabilities for providing products and services for these emerging opportunities.

Who Is InterNuntius & How Can We Help?

InterNuntius, Incorporated is a strategy and management consulting company. We specialize in solving complex business organizational, technology, and business process issues. Since 1997, InterNuntius has provided strategy, planning, assessments, and business solutions for many of Minnesota's top companies and over 40 government agencies.

We have extensive expertise in the following functional areas:

- Project Oversight and Management
- Requirements and Consensus Facilitation
- Complex Business Process Modeling including Health and Human Services
- Enterprise Architecture and Methodology Development
- Financial Systems Development and System Process Automation
- Project Scope and Definition Identification
- Research and Feasibility Studies including Cost Benefit and Returns Investigation

InterNuntius also has extensive experience in the Health and Human Services Industry including:

- Hospital Administration and Finance
- Medicare Cost Report Preparation and Insurance Reimbursement Audits
- In-patient and Out-patient Surgery Clinics
- Durable Medical Equipment Dealer Administration
- Retail Pharmacy Administration
- Nutritional and Liquid IV Therapy Pharmacies
- Home Visiting Nursing Administration including OptionCare Franchise
- Hospital Capital Improvement Planning and Strategic Health Management Buyouts

In addition to our Health Industry experience, InterNuntius has worked with a number of public companies including Snap-On, Pentair, American Express, Lincoln Electric, Caterpillar, Ceridian, Imation, and Land-O-Lakes. Other clients include large private companies such as Cargill, Carlson Companies, and Interstate Companies. InterNuntius has also worked with the Metropolitan Airports Commission, the Minnesota Department of Commerce, Minnesota Department of Human Services, Anoka County, and over 40 Community Action Program (CAP) Agencies in the government and human services sector.

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About the Author

Bryant Avey is the CEO and founder of InterNuntius, Incorporated. He spends approximately eighty percent of his time consulting InterNuntius clients and has over eight years of experience in the Health and Human Services Industry. In December 2004, Mr. Avey received a service recognition award from the Commissioner of the Minnesota Department of Commerce for his role in providing a strategy and architecture in the statewide eGovernment solution, eHEAT, for the Low Income Heating and Energy Assistance Program (LIHEAP).

Mr. Avey has developed white papers on employee retention and developed conference seminars for the International Association of Personnel in Employment Security (IAPES) on the topic of Branding Your Environment and Strategic Career Growth. He has also produced an audiotape for InterNuntius Academe Presents entitled Employee Retention in the D-Age Environment. The audio program covers several case studies of organizations that have excelled in creating winning employee environments.

Mr. Avey has been published in some fourteen different publications including: Chief Executive, where his article was the CEO's Challenge of the month; International Personnel Management Association's IPMA News; the Hartford Business Journal; Four Corners Business Journal; Legal Management Magazine; The Professional Journal; Benefits & Compensation Solutions; Employee Assistance; The American Management Association's Manage Magazine; the Northeast Pennsylvania Business Journal; and Employee Benefit News.

A complete discussion on topics discussed in this white paper can be found on the InterNuntius Web Forum at: <http://InterNuntius.com/Forum>. Users must register to participate in forum discussions.

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Frequently Asked Questions (FAQ)

What does it mean to Auto-Adjudicate?

Auto-adjudication is the process of automatically approving, denying, or adjusting a claim transaction without human intervention.

What is an Electronic Health Record (EHR)?

An electronic health record is the generic term for all electronic patient care systems.

What is a Personal Health Record (PHR)?

A personal health record is an electronically accessible personal patient chart. The PHR contains information about each visit to a health provider including physician orders, lab reports, imaging and x-ray reports, immunization records, consent forms, and other medical record and medical history information.

Clinical Health Data Repository (CHDR)

CHDR provides bi-directional exchange of health data and is integrated with the clinical decision support systems. Using CHDR clinical decision support applications, providers will be able to access and use relevant clinical data to make important medical decisions for their patients regardless of where the information resides.

How do I describe Enterprise Architecture?

Enterprise Architecture is a framework whereby an organization can identify its baseline and future components. More specifically, EA covers present and future lines of business, desired performance outcomes, data types, information technology, and the service channels through which an organization delivers products and services. EA consists of reference models, policies, and operating procedures.

What is the Federal Enterprise Architecture?

The FEA, established in 2002, is a business and performance-based process and model, or framework, to support cross-agency collaboration, transformation, and government-wide improvement. FEA defines work activities and technologies by components; hence, it is called a Component-Based Architecture (CBA). The FEA Program Management Office (FEAPMO) within the Office of Management and Budget (OMB) oversees the FEA. The FEA is the basis for the Health & Human Services Federal Architecture (HHS EA).

What is a Component-Based Architecture?

A Component Based Architecture (CBA) bases its design upon categorizing business, service, performance, technical, and data elements, at their lowest level, as components, and recognizing larger

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lines of business, service, and technology infrastructures as combinations of components. By defining and publishing these "groups of building blocks" in the Federal Enterprise Architecture (FEA), OMB has, as a primary goal, the reuse of components across the Federal Government. Secondary OMB hopes to increase efficiency, and program effectiveness, and reduce costs.

Is EA done just once for an organization?

No. The EA process is dynamic, with cycles of revision for the current architecture, the target architecture, and the plans of action and milestones to reach the target architecture. The Plan of Action is known as a Modernization Blueprint. Once an initial Modernization Blueprint is established, a continuing process leads to adjustments of that Blueprint. Further, a Maturity Model Self Assessment tool provides a way to evaluate an organization's achievements and identifies short- and long-range tasks necessary to maintain an excellent Enterprise Architecture.

What are the Department's committees associated with Enterprise Architecture?

Direct Enterprise Architecture teams are: The Interior Architecture Working Group (IAWG), the Architecture Review Board (ARB), the Interior Business Architecture Team (IBAT), and the Data Reference Model Steering Group (DRMSG). Enterprise Architecture is mentioned as a high priority in the Department's Strategic Plan and is discussed in other related committees: The CIO's committee, the Information Technology Management Committee (ITMC); the E-Gov Team, the DOI-wide E-Government initiatives' team that deals with the E-Government part of the President's Management Agenda (PMA); The IRB, the senior-management Investment Review Board that receives information from both the ITMC and the E-Gov Team. The IRB reports to the DOI-wide senior-level Management Initiatives Team (MIT), that in turn supports the MEC, the highest-level DOI Management Excellence Committee.

What Business Areas are included in the FEA?

The four Business Areas included in the FEA are: Service for Citizens, Mode of Delivery, Support Delivery of Services, and Management of Government Resources.

What are some of the transaction types that we can expect under the new architecture?

Six general types of business transactional relationship have been identified within the health services marketplace:

B2P – Business to Patient: Hospitals, clinics, and doctors offices provide service based transactions to patients. The patient relationship is unique to the healthcare market and is differentiated from relationships with members, employees, or consumers due to the unique HIPAA and patient information requirements.

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B2M – Business to Member: Health insurance providers and other member-based health organizations provide transactional services to their members.

B2B – Business to Business: Businesses exchange data and transact business between themselves. This includes transactions between clinics, physicians, insurance providers, pharmacies, and other health network providers.

B2G – Business to Government: Businesses exchange data and transact business, claims, and services with various local, county, state, and federal governments.

B2E – Business to Employee: Business provide various services to their employees or provide employee assistance services for various customer's employees.

B2C – Business to Consumer/Client/Customer: Business is transacted directly with the end consumer, client, or customer. Transactions are specifically tailored for the consumer.

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