

# eHealth Communications

## ■ Web Portals

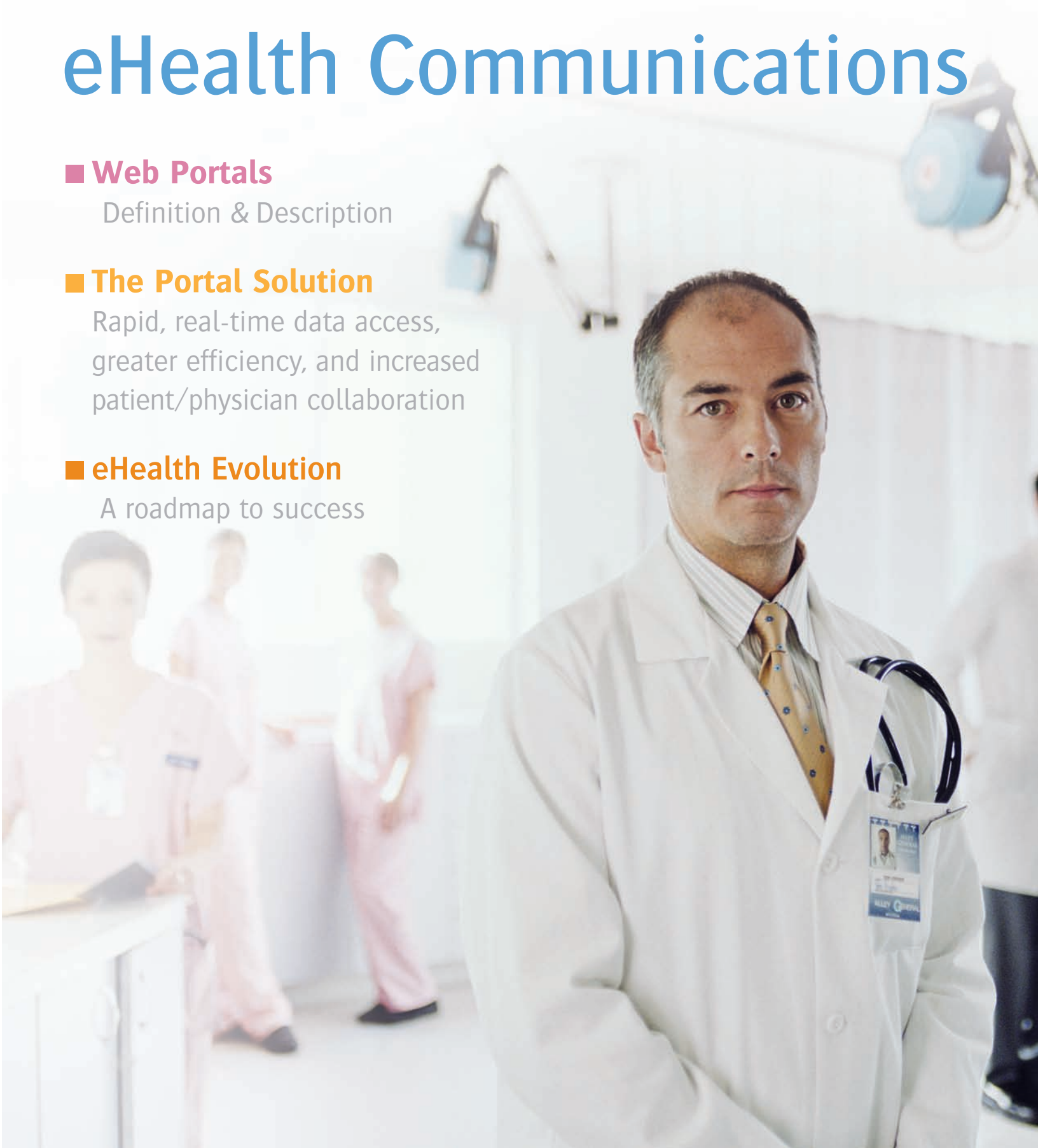
Definition & Description

## ■ The Portal Solution

Rapid, real-time data access, greater efficiency, and increased patient/physician collaboration

## ■ eHealth Evolution

A roadmap to success



# Portal Communications: The Promise Of eHealth

The past few years have been busy ones for those involved with automation of processes within the healthcare industry.

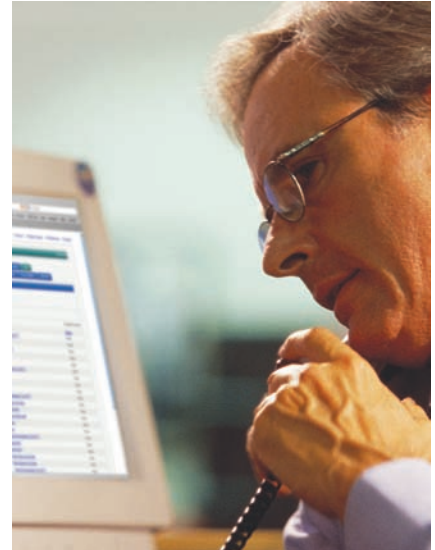
As a result of these efforts, people everywhere are increasingly benefiting from web-based information technology, and savvy web-users are finding the outdated information systems traditionally associated with delivering healthcare nonsensical. Antiquated systems and processes combined with poor information flow are increasingly resulting in under-use, and misuse of healthcare services. Add to this the pressure from the full spectrum of consumers, payers, and policy makers, and all eyes are on the sources of wasted resources, operational inefficiencies, and unsafe care. The call for a significant restructuring of our healthcare system is coming from the highest levels of government, demanding that the industry take advantage of the time, cost, and resource efficiencies promised by healthcare information technology— including electronic health records (EHR) and web-based information exchange.

To put the fundamentals in place in Canada will cost between \$10-billion and \$12-billion, or about \$300 for every Canadian citizen, according to a study by consulting firm Booz Allen Hamilton Inc. However, returns would be enormous, amounting to about \$6-billion a year, in the form of improved quality of care, better safety and greater productivity”

as Mr. Richard C. Alvarez, President and Chief Executive Officer of Canada Health Infoway identified.<sup>1</sup>

Healthcare executives have a unique challenge in responding to the eHealth call to arms, as even new systems may also create inefficiencies and risk for patients if not utilized properly. Somehow, leaders must enable their organizations to evolve while protecting the financial stability of the institution and the well-being of the patients. This includes providing the modern tools, training and support to move forward and evolve their health delivery platform. This can be accomplished incrementally by growing the universal understanding of viable, effective technologies and sharing our successes and failures as an industry. There is no longer any choice about joining the eHealth revolution. It is becoming the rule, not the exception— and it’s gaining momentum everywhere.

This is why tools have been introduced to help realize the promise of eHealth. A proven portal solution not only leverages, enhances, and augments existing IT investments, but also evolves information delivery platforms towards a more open, vendor-neutral, patient-centric environment.



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# Canada's Health System:

## A tangled, highly fragmented network



Canada's health system is a tangled, highly fragmented network that often wastes a great number of resources by duplicating efforts, leaving unaccountable gaps, and failing to build on the strengths of our health professionals and clinical expertise. Even though Canada's health care delivery carries a significantly higher price tag than more than most other industrialized nations, Canadian's only receive only about half of the recommended care for that investment. With an aging population, extended wait times, and chronic conditions reaching epidemic proportions, our healthcare system will not survive without radical change.

FROST & SULLIVAN

According to Frost & Sullivan<sup>2</sup>, increasing integration is creating the need for a single point of contact to healthcare IT (HIT) systems, which in turn, is driving the eHealth market.

eHealth, the application of web-based information technology to healthcare, can profoundly change the way the business of healthcare is conducted—making it safer, more affordable, and significantly more efficient. However, transforming traditional modes of delivering care will require Health Care organizations (HCO) to take advantage of the enormous potential offered by information technology in far more complex ways. Previously, eHealth was stalled by interoperability issues and a lack of workflow-driven, secure information exchange. Today however, progressive technology and innovative solutions are enabling unprecedented advancements.

The relatively brief history of Health Information Technology (HIT) has taught organizations the high costs of failure, which has caused Health Care Organizations (HCO's) to prudently proceed with guarded optimism. Although there is recognition of the benefits of eHealth, when combined with a market already crowded with HIT vendors attempting to help HCO's realize a return on investment (ROI,) it becomes increasingly difficult to identify a vendor with a meaningful track record. As such, the majority of Health

Care Organizations have been watching the progress of vanguard organizations before they commit their time and money.

Waiting to join the eHealth movement has its own disadvantages. Besides prolonging current inefficiencies, laggard organizations may miss an important window of opportunity, and the benefits of adopting eHealth strategies are too great to ignore. For HCO's determined to take advantage of the current Infoway driven EHR environment, the next imperative action is to outline an appropriate technical platform for their eHealth strategy.

Fundamentally, organizations are seeking a platform that allows the seamless delivery of information across the continuum of healthcare. Fortunately, this objective can be met without cost-prohibitive, universal replacement of existing HIT. Moving forwards with a portal communications strategy can bind the information technology of disparate facilities and stakeholders into an interactive user community using advanced, but proven, web portal technologies.

2. Frost & Sullivan (<http://www.healthcareandlifesciencesIT.frost.com>) from "Growing Integration and Need for Single Point of Contact Drives Healthcare IT Platforms Market, 2007."

# Web Portals:

## Definition and description

From the user perspective, a web portal is technology that allows an individual or user community to gain convenient access to a broad range of information and services through their web browser.



Most HCO's serve a variety of stakeholder communities, including providers, payers, patients, employees, and consumers. Each of these stakeholder communities benefits from a portal that is targeted specifically to their needs, aggregating information of value for them and allowing them to communicate freely with the host organization and each other.

For the hosting HCO, a portal is an integration tool that incorporates service and data management applications with workflows and business processes to present a unified, personalized, and streamlined gateway to their enterprise for its stakeholders. The HCO establishes a portal strategy to offer timely access to real-time information resulting in better customer service that is accessible from a single point of entry, regardless of which system generates the information or where the information resides. While a provider portal, patient portal,

employee portal, and a consumer portal each appear independent of the other, they are clearly interrelated. Since healthcare consumers may be patients, employees, or even providers, their needs will overlap. Therefore, each stakeholder may require access to the others' data as well as additional common data sources.

A portal solution can serve to aggregate information stored in disparate, incompatible systems using a Service-oriented architecture (SOA). SOA describes a product architecture that allows tight integration with underlying applications, without requiring system interoperability. This also allows users to access software functions independent of the underlying platform and/or programming language. It permits services to be rolled into larger applications that can be incorporated into portals, without locking the enterprise into a specific vendor. While the SOA concept has

been around for quite some time, emerging standards-based integration technologies like Web services and XML have just recently made it practical. The benefit for your healthcare organization is clear – a SOA enables eHealth while protecting the enterprise's investment in legacy software. As organizations search for viable tactical path to leverage a service-oriented architecture, many can use portal products as a first step.

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A portal incorporates data management applications with workflows and business processes to present a unified, personalized and streamlined gateway to your enterprise.

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# Portal Solution:

## Empowering communication



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By empowering patients, providing rapid, real-time data access, greater efficiency, and increased patient/physician collaboration, everyone benefits.

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Although eHealth applications serve the needs of many different stakeholders, there are four major stakeholder groups, which illustrate the value of this solution: patients, physicians, consumers and employees.

In spite of the differences in type and format of information and services each group requires, there is significant overlap and common desire for:

- + A more positive Physician/Patient experience between clinicians and patients
- + A more satisfying and effective clinical experience for patients and caregivers
- + A more transparent technology experience for all of the stakeholders, but particularly the caregivers and IT staff, easy to use and easy to maintain
- + Better IT cost control to make the CIO and CFO's job of keeping costs down easier
- + More referrals and admits because of streamlining and efficiency improvements that expand a facility's capacity
- + Brand advancement, fulfilling the goals of the marketing department and CEO of improving community awareness and market position
- + Better recruiting retention because of more effective use of staff time and skills, and easier access to human resources and other employee information
- + Improved operations for administrators and clinicians, building on existing skills and significantly reducing unnecessary mundane tasks

However, while many vendors offer partial solutions, few offer a comprehensive portal communication solution. Legacy HIS/CIS vendors offer applications targeting information access and management, and while they improve the physician/patient experience and provide operational efficiencies, the needs of the other stakeholders are not addressed. Traditional web vendors, on the other hand, tend to focus on content management systems that excel at promoting an organization's brand but leave the needs clinical and operations stakeholders underserved. Somewhat more comprehensive, electronic medical record (EMR) vendors offer vital elements of the big picture solution, but cannot accomplish the complete transformation that browser-based systems promise.

# eHealth Evolution: Into the future

The Gartner Group<sup>3</sup> has identified five levels of eHealth development using Portals, the elements that comprise them, and what it takes to move from one level to the next (see Figure 1).

Health Care Organizations continue to significantly use portal products to build and deploy a variety of customer, citizen, partner and employee-facing enterprise portals.

Portals have evolved through four generations of technology and are embarking on their fifth generation. In the beginning, eHealth bore relatively simple websites that provided new levels of information accessibility to healthcare consumers. As the technology evolved to Level 2, searchable directories and more interactive features were added, providing dynamic new options for HCO marketing and administration departments. It was possible to promote classes and services, help people find reliable current health information and appropriate specialists, make human resources information readily available to employees, and collect and manage data using the Internet.

Since Generation 2, portals have leveraged service-oriented (SOA) capabilities. Generation 2 portals

provided a rudimentary method of composite application assembly known as interportlet communication. Organizations can use interportlet communication to build composite applications by linking portlets related to a specific business process. This type of composite application is referred to as "on the glass" because the integration is at the presentation layer rather than deep in the business logic. This

integration approach is effective for user-driven processes, and advanced enterprise portals use interportlet communication extensively.

Level 3 applications required a broader revolution within healthcare from paper to electronic medical records, which was reliant on emerging data standards and the willingness of HCOs to empower their users with more control and access.



Generation 3 portals enabled systems to handle basic Web services. These portal products could consume Web services. The addition of workflow, which is a feature of most portal products, introduced a new way to orchestrate composite applications. Over time, the experiences of the early adopters and results of pilot projects generated sufficient results to compel

cautious HCOs to pursue the promise of eHealth. With Level 3 adoption no longer stalled by technological limitations and the pervasive wait-and-see mentality, the next wave in eHealth is cresting. Transformational web portals will offer business process management with workflow automation, alerts, and reminders, integration with patient records, medical device uploads and a

host of other equally exciting advances. Together, the unified data resources and user interaction will radically alter best-practices for patient care and healthcare efficiency.

(Continued on next page)

**Figure 1: Five Generations Of eHealth Portals**

**Generation 5**

- + Advanced collaboration
- + Service-oriented business application support
- + Orchestration
- + Syndication

**Generation 4**

- + Multichannel interaction
- + Advanced web services
- + Composite applications
- + Universal federation
- + Personal content
- + Micro sites
- + Support for JSR 168 and WSRP

**Generation 3**

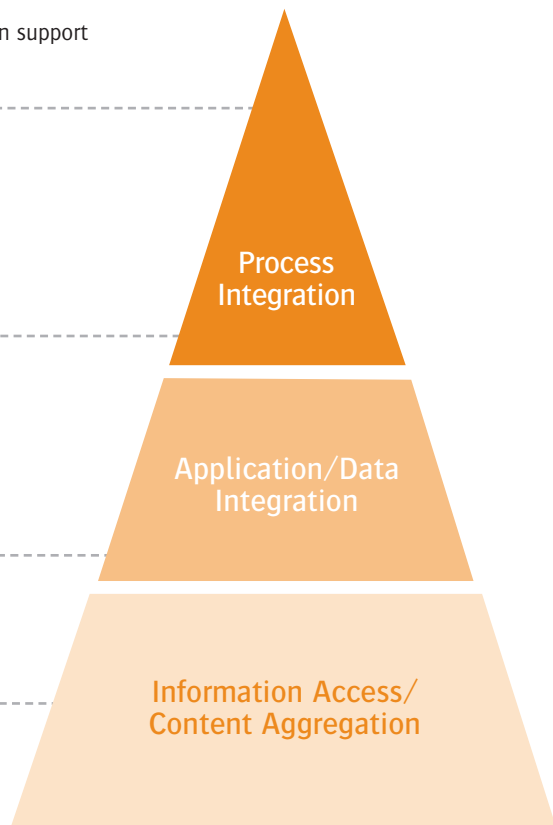
- + Advanced personalization
- + Knowledge management
- + Multiple portals
- + Web services
- + Process integration
- + Offline support
- + Abstraction layers
- + Federated search

**Generation 2**

- + Robust application framework
- + Mobile and wireless
- + Collaboration
- + Management framework

**Generation 1**

- + Content mgmt./aggregation
- + Personalization
- + Search/categorization
- + Lightweight application framework



In February 2006, a survey of healthcare CIO's ranked the area for which they would be most likely to offer increased functionality via their web presence. Offering patients the ability to schedule appointments through their website was most frequently identified, followed by utilizing a physician portal link and providing consumer health information. However, only a handful of the CIOs report that their website is used to offer patients secure and authenticated access to medical records.

Finding themselves repeatedly on the cutting edge of eHealth, vanguard organizations are evaluating the appropriate technical platform for Level 4 applications. With Generation 4, portals started to leverage advanced Web services. This included the ability to provide Web services, as well as consume them. It also supported the first Web services standard for portlets, Web Services for Remote Portlets (WSRP), which enables one portal to consume a portlet from a different portal, using Web services protocols. Thus, portal pages could include local and remote portlets, all supporting a single set of processes.

Generation 5 is emerging (see Figure 1.) Advanced features include support for business process management (BPM), service-oriented applications (SOBAs) and orchestration, critical features to support advanced composite applications. Business Process Execution Language will become the standard orchestration language for portal products and will extend beyond the capabilities of their current workflow features.

## Four areas underserved despite great promise

### Consumerism

Rather than being passive participants in their own healthcare, today's patients are looking for return on investment and driven by the spiraling cost of health insurance and growing out-of-pocket expenses.

### Clinical

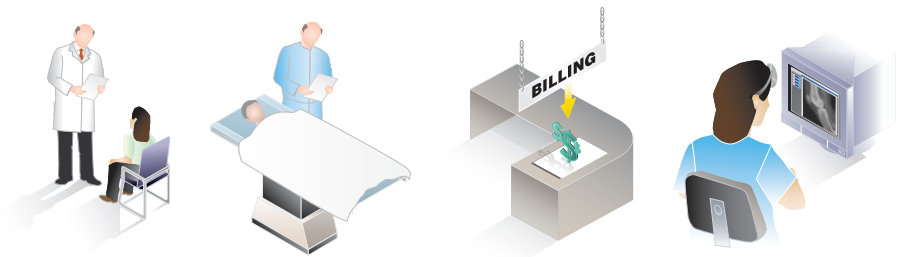
Advances in service delivery and clinical outcomes through better adherence to clinical protocols and more informed decision-making, reductions in medical errors, decreased morbidity and mortality, and expedited recovery times.

### Financial

Cost reductions and revenue enhancements from quicker charge capture and shorter billing cycles, productivity gains from all types and levels of staff.

### Organizational

Improvements in stakeholder satisfaction through shorter wait times, better access to reliable healthcare information, and better relationships with clinicians; higher productivity from increased procedure volume, reductions in the average length of stay, quicker transaction processing turnover, lower administrative staff and resource requirements; more effective risk mitigation, and increased adherence to federal, state, and accreditation organization standards.<sup>5</sup>





# The portal promise:

## Information consolidation



Current, partial solutions can be made whole with interoperable portals through which all healthcare stakeholders will exchange information and engage the enterprise. Enterprise information portals are intended to consolidate a vast array of information from a multitude of sources onto a single screen. Portal technology enables different IT systems and software applications to communicate, to exchange data accurately, effectively, securely and consistently, and to use the information that has been exchanged.

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A portal strategy should be built on a stable, secure framework, offer single sign-on, single-patient/ single-view access to all information using a coherent system of portals— simultaneously serving the needs of the wide variety of stakeholders.

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A comprehensive portal communications solution should include broad-based applications through:

- + Flexible, easy-to-use web content management tools for rapid application development by both non-technical staff and programmers
- + Interoperability between incompatible legacy HIS systems, and real-time data access
- + Secure communication allowing patients and providers to communicate conveniently
- + Integrated third party applications for additional functionality

# Technology that overcomes: Eliminating adoption issues

With billions being invested in the migration from paper to electronic records, rapid ROI is a determining factor on the minds of executives and administrators concerned about their bottom line. Speedy, enterprise-wide adoption is critical for any eHealth initiative to realize the full benefits of their investment.

## Elusive Return On Investment

Delays and patchwork systems negatively impact the organizations' ROI. Still, adoption continues to be spotty, despite incentives. In part, the gradual adoption curve can be ascribed to common complaints of HIT; accompanying workflow and systems integrations require process changes that can be intimidating. Reengineering the way work is done presents challenges that extend far beyond use of the technology. Changing the enterprise culture and convincing busy professionals to adopt and learn new systems are essential but challenging components.

A study conducted in 2001 found 121 administrators and physicians working for HCOs agreed that in order to remain competitive, providers must move toward interactive consumer web self-service capabilities (e.g. scheduling services, pre-registering for services and bill payment) and online physician patient communication. However, the reluctance to proceed was tied predominantly to a lack of funding followed by a lack of commitment, fear,

politics and other intangibles that must be overcome if an organization is to be able to achieve the advanced website functionality. These findings were reiterated in the 2006 HIMSS CIO Leadership survey, which found that for the sixth consecutive year, respondents identified a lack of adequate financial support for IT as the most significant barrier to a successful implementation of IT at their organization.

Certainly, ROI is an important factor in any healthcare IT acquisition. A prudent capital investment is measured by its contribution to the sustained financial strength of the organization. However, the use of capital assets for eHealth objectives cannot be measured solely on the balance sheet. When capital investment improves clinical outcomes, reduces preventable medical errors, and eliminates common sources of waste, the return is evident in healthier patients.

## Clinical System Interoperability

The fragmentation of legacy HIT systems causes interoperability issues that can undermine an organization's



confidence in their ability to successfully implement a comprehensively integrated web solution. The data systems needed for an outpatient setting require a different level of sophistication than those that regulate admissions, discharges, and transfers within in a large hospital. Each system is defined by unique vendor standards, some of them decades old. These hurdles make a seamless, rapid data sharing format seem out of reach. Integration can be tackled with the latest web technology. Using a "virtual electronic health record (EHR)" model, any HCO can connect underlying systems rapidly and cost effectively to deliver views of clinical information through secure, single sign-on, web-browser technology. The virtual EHR is dependent on a decentralized, federated data model. Using this architecture allows HCOs to leverage legacy HIS/CIS investments, avoiding the maintenance of an expensive Central Data Repository (CDR).

The federated data model eliminates system integration hassles and overcomes patient identification challenges with master patient indexing algorithms. It seamlessly integrates disparate clinical and census data, transforming fragmented data into a clean and concise dashboard of clinical information. For example, a virtual EHR presents admitting, attending, and referring physicians with ready access to all of their patients' clinical information and, when combined with systems such as computerized physician order entry (CPOE), provides the ability to input patient order entry and review via a web browser. Additionally, online continuing medical education (CME), calendars, scheduling, clinical trial information, grand rounds, physician newsletters, and relevant clinical content may all be presented in a customizable view for each user.

### Physician Acceptance

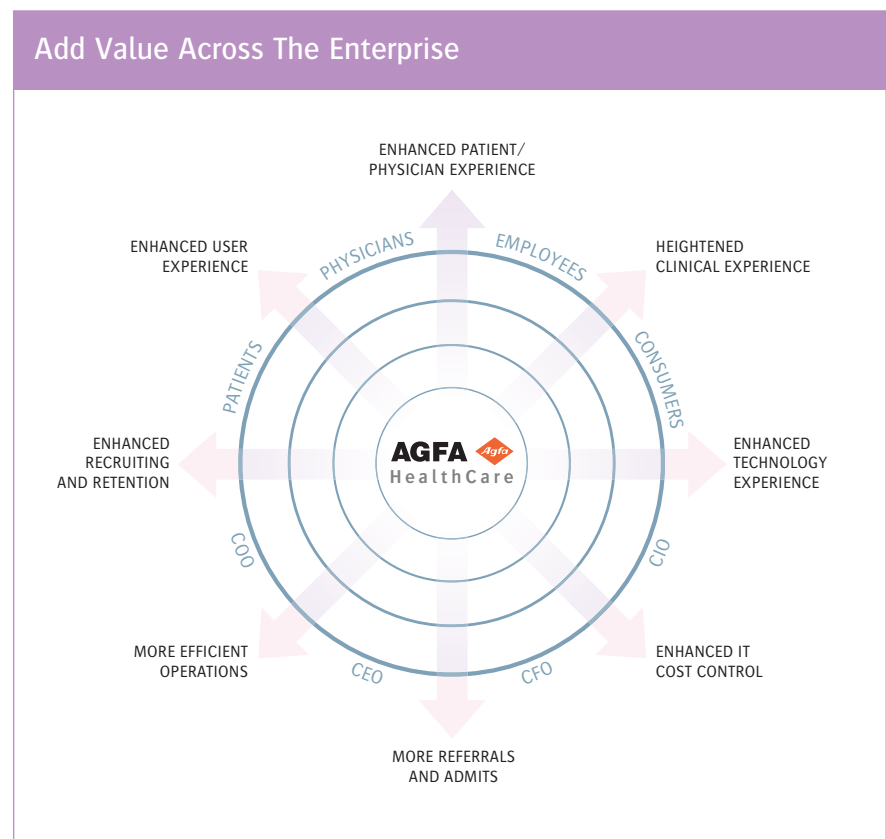
The biggest concern for busy physicians is the time and energy required to transfer data and learn a new system. They are understandably reluctant to spend time away from patient-facing activities to address administrative business. To reduce training time, leading eHealth solution providers devote considerable resources to researching and designing intuitive applications that build on existing user experiences best practices.

Additionally, the federated data model eliminates the need for physicians to learn underlying applications for checking labs or reviewing films, as the view they see does not require them to interact with the software, only to view it.

### Patient Identification, Privacy And HIPAA Compliance

Understandably, HCOs and physicians are sensitive to their responsibility to protect confidential patient information and may see rapid, real-time online

access to vital information as a threat to privacy. Adequate security measures and an architectural design must be engineered to allow an organization to implement eHealth applications with demonstrable compliance with regulations and respect for the patients' rights. Authentication protocols and CAPTCHA, encryption of secure messages, automatic audit trails of information access, controlled workflow and secure servers guard patient information from unauthorized access.



# New technology: Follow the leaders

## Cost And Training Issues

In the 2006 HIMSS CIO Survey, lack of staffing resources was identified as the second most common barrier to IT adoption. Time and resource efficiencies enabled by eHealth have been demonstrated to pay for themselves in as little as a year. Fewer chart pulls and phone calls, speedier access to accurate information, lower record maintenance, and staffing costs, and revenue enhancements together create a synergy of efficiency—more than compensating for the up-front investments. For example, reducing the need for just one ministrator/trainer can save significant financial resources. One estimate based on a 40 hour work week over 50 weeks, and an average annual salary of \$50,000, suggests that reducing one full time trainer can yield a savings of \$61,000 USD a year. The architecture and design of eHealth products are focused on allowing non-technical users the maximum flexibility to manage their websites and portals. Additionally, intuitive design reduces the need for training and results in an immediate cost saving.



eHealth is no longer in its infancy, yet sustained concerns about implementing new technology is understandable. It's a real challenge for most organizations to create a tactical plan to ensure that their web capabilities support current corporate objectives. It is far more difficult for HCOs to devise a long term plan that serves the evolving needs of the organization, adapts to technological advances, and meets new societal demands. The pressure to deliver on high-priced projects adds gravity to the matter. The initial expenses are just a small piece of the overall financial commitment an HCO makes in the transition to eHealth, and the failure rate for EHR implementations is estimated at 30 to 50 percent. False starts and implementation timeline overruns are too costly for most HCOs to risk.

To overcome these barriers, part of doing it right the first time requires research to learn from organizations that have been successful in their own eHealth initiatives. Over the past decade, a wide variety of HCOs have achieved eHealth success, from early-adopting visionaries constantly striving for better ways to engage their stakeholders, to more cautious pragmatists waiting for proven solutions to their online needs.

# Competitive hospitals: Transforming delivery platforms

To remain competitive hospitals will soon have no real choice but to further transform their delivery platform. Organizations unable or unwilling to keep up are in danger of losing their competitive edge. The trick is to survive the transformation without multi-restarts, multi-level failures and multi-millions wasted.

The potential to succeed however, has never been clearer. A proven model is available that delivers rapid, convenient access to any and all

lifetime patient medical information from anywhere, regardless of when and where the care was delivered. Such a system is easily deployed, satisfies the need for cost effectiveness (ROI), dramatically increases productivity (efficiency,) and best use of resources. Ultimately, such a platform creates a healthcare environment that provides both patients and providers with improved outcomes and higher satisfaction. Portals will allow transactions (and

information) to flow rapidly and seamlessly over the web, but first the groundwork must be laid. Thankfully, proven technology exists (as demonstrated by Agfa HealthCare's IMPAX Clinical Dashboard™) to help healthcare organizations transition smoothly from one level of eHealth to the next. Ultimately, confidence in proven solutions will embolden the willingness of responsible managers to move forward with and capitalize upon the promise of eHealth.

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*Authored by Andrew Giles, Marketing Manager, Agfa HealthCare. Parts of the copy are reprinted with MedSeek's permission.*

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