Provider Kiosk Project

Improve the client experience
Lower costs
Regulation compliance
Reduce medical errors

opengate

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1 Concept

Provide a point of entry system for patients to improve their experience, automate the processes, capture data, provide information, and performs transaction processing. The system would be composed of integrated modules for equipment and application solutions enabling the system to be a gateway for other services and vendors as well as enabling it to grow and collapse various sub systems. The system should be NHII aware to meet standards and ensure interoperability in the future.

2 Problem statement

As a client enters an emergency room or large provider group, they may encounter three things; unnecessary care, cost, and anxiety. The encounter starts with an inefficient and painfully slow process. The check in may be long. The information about coverage may be unclear and providers have difficulty understanding the level of benefits for the client as they enter. Costs are experienced by the provider and insurance companies.

3 Opportunity

Provide a system consisting of a kiosk application or provide a module into an existing kiosk system from another provider for patient check in processes.

3.1 Benefits

Decreases costs for healthcare provider and insurance agencies by efficient processing and minimal administration support. Saves time and enhances the patient experience by faster processing, minimizing waiting, and accurate check in.

Reduction in medical errors since the patient is identified properly, benefits are identified properly, and care history is available.

Compliance with new regulations (HIPAA).

3.2 Challenges

A key challenge is the widespread adoption of Electronic Medical Records (EMRs – see reference section) that integrate at a higher level into Electronic Health Records (EHRs – see reference section). Presently, there is a low adoption of EMR, lack of standards, lack of interoperability, and a lack of a way to uniquely identify and locate patients and match them with their records (universal patient registry). This is especially true among small independent physician practices, labs, and clinics where most of healthcare takes place.

Another challenge is operability for handicapped people. IVR in a public area does not guard privacy.

Security and meeting future NHII requirements is a big challenge for adoption.

When power outage or connectivity outage, how to hold and transfer data and what functions are performed.

4 Objectives

- Quick adoption and approval rating
- Enhance client experience
- Enhance client check in process

5 Situation Analysis

5.1 Value Chain: Who is in the space

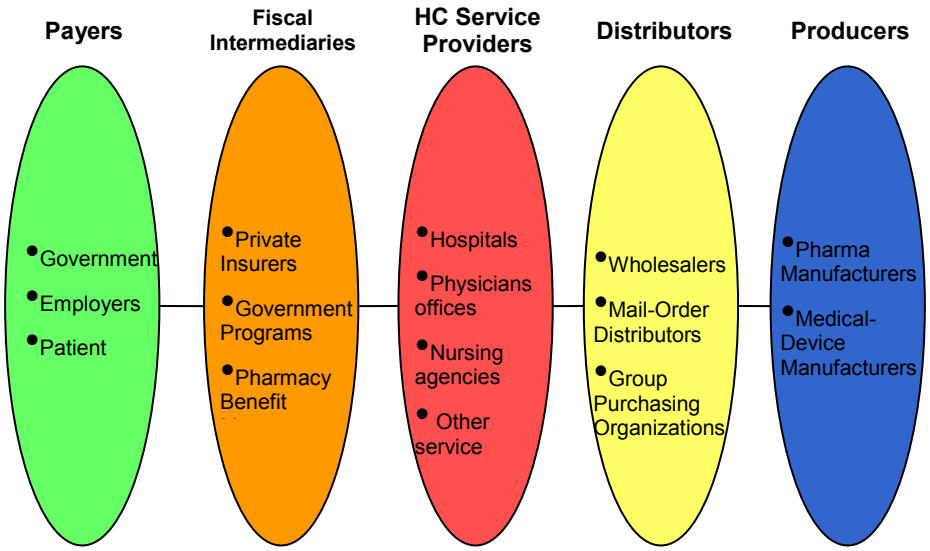
Organizations: NHII (National Health Information Infrastructure), HHS (US Human and Health Services). These organizations influence standards, processes, and IT infrastructure.

Payers: Medicaid, Medicare, patients, companies

Fiscal Intermediaries: UHC. These organizations influence spending priorities and business practices.

Healthcare providers: Hospitals, doctors' offices, nursing homes

Producers



Source: Wharton School Study of Health Care Value Chain

5.2 Trends

5.2.1 Regulatory Issues

- HIPPA compliance issues with new security regulations

- SOX
- NHII

5.2.2 Self-Service

Self service is already embedded and growing in many industries such as banking, retail, travel, hotels, leisure, and fast food.

5.2.3 Information Management

The healthcare industry is now in an early, but active, phase of transformation from fragmented and disconnected islands of medical decision making and record keeping towards connecting the islands of information flow.

B2B components include the flow of health records, collaboration among service providers, and population data collection for threat monitoring, research, and propagation of treatment guidelines to practitioners. B2C includes delivery of education materials, patient access to health records, and patient's ability to communicate with their healthcare provider (schedule appointments, submit questions).[1]

5.2.3.1 Transforming the public health information infrastructure

The public health information infrastructure is undergoing a transformation that is enabled by changes in health care informatics. The implementation of the Health Insurance Portability and Accountability Act (HIPAA) of 1996, the patient medical record information standards, and National Health Information Infrastructure (NHII) recommendations by the National Committee on Vital and Health Statistics provide the basis for improved data reporting to public health agencies. The U.S. Department of Health and Human Services should provide leadership and resources for this transformation. Newly available federal resources will have the greatest effect on improving the information infrastructure if there is a strong commitment to developing and implementing public health data standards that build upon the National Electronic Disease Surveillance System.[2]

John Lumpkin, MD is the chair for the NCVHS Workgroup on the National Health Information Infrastructure (NHII).

Government Strategic IT

HSS: The Presidential goal for EHRs is 2014. Looking into standards-harmonization processes, development of conformance certification processes, evaluation of state laws and government regulations like HIPPA that affect privacy and security practices, and a prototype of a scalable national health information network architecture. Regulations could provide a challenge to interoperable health-data exchanges.

The NHII includes not just technologies but, more importantly, values, practices, relationships, laws, standards, systems, and applications that support all facets of individual health, health care, and public health. It encompasses tools such as clinical practice guidelines, educational resources for the public and health professionals,

[1] HIMSS Summit Report by Yana Kane-Esrig
[2] John R Lumpkin and Margaret S Richards

geographic information systems, and health statistics at all levels of government, and many forms of communication among users. The key NHII stakeholders and health information users are consumers, healthcare providers (both individuals and organizations), and public health professionals at local, State, and national levels.[3]

5.3 Kiosks

Kiosk solutions have been on the market for a while. Some providers, such as the Otech Group LLC claim a 97% approval rating. Kiosk solutions have been targeted at hospitals, nursing homes, and doctor's offices. Doctors tie into systems via tablet PCs and PDAs. $775 million kiosk market by 2008 (Frost and Sullivan).

Benefits: Multipurpose, instant setup, wireless networking, information exchange, secure payment

5.4 Existing Systems for electronic records and processing

PMS – Practice Management Systems

5.5 Questions

5.5.1 Value Chain - Benefits

What is the value chain?

Can UHC dictate the standards to the other players in the value chain?

How will this differentiate UHC?

Is the value chain like credit cards where you have a clearing house?

Who are the likely partners you will need?

What is the business case for the solution? Can you quantify the cost savings for reduced errors?

What is the benefit to the hospital facility for installing? Will they want the kiosk and why? Is the kiosk something UHC can dictate or do they need to negotiate?

5.5.2 Information

How owns the information who is allowed access to it?

Is there info that UHC isn't supposed to get access to?

Where and with who is the information housed?

Who is responsible for guarantee accuracy and timely responses?

5.5.3 Alliances

How can you leverage the financial services industry's knowledge, architectures,etc?

5.5.4 Systems – Interface – Architecture - Standards

Are there any existing standards that can be leveraged to ease deployment? Are there any standards you would need to drive to ease deployments?

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[3] http://aspe.hhs.gov/sp/nhii/Documents/nhiilayo.pdf

What type of systems will be required to guarantee responses, accuracy?

How does the info interface with the hospital systems? Every hospital has a different system - is custom integration required every time?

Who are the kiosk vendors? What can they bring to the table?

What security mechanism will be required?

What existing systems will it need to interface into?

What new systems will be required?

5.5.5 Deployment- Support

What is the implementation required (hooking into the facilities network, running your own DSL line)?

What are the logistics required for maintaining & delivering the swipe card

What on-going support is required? customer Service? Technicians?

5.6 Use Scenario

The following is a scenario extracted from an HSS government report regarding healthcare information systems. The scenario shows that automated records

Avoiding unnecessary care, cost, and anxiety: Mr. S. flies across the country to start a new job. He has already chosen a medical practice in his new town because it has the same online health support service as his previous doctor, even though it is a different medical plan. He can set up appointments, get prescription refills and lab results, e-mail the doctor or nurses, and manage his personal health history.

A week after he arrives, he develops fever and muscle aches. Fearing that he may have anthrax or smallpox, he e-mails his new doctor a list of his symptoms, along with his itinerary over the previous 14 days. The doctor's automatic system immediately matches his itinerary against the public health database of anthrax and smallpox occurrences and runs his symptoms against his own personal health record, including his medications. It sends an urgent alert to the doctor, who sees no likely source of exposure for Mr. S. but spots a potential drug-drug interaction. She calls him and tells him that the new drug he just started could have caused an adverse reaction. She feels confident that he does not need to come in for tests or take unnecessary antibiotics. Instead, she changes his medication and asks him to e-mail her in 24 hours.

The next day, his e-mail message confirms that his fever and aches are gone. Unnecessary lab tests, investigation by public health authorities, anxiety for Mr. S. and his family, and an unneeded antibiotic are all avoided. This "nonevent" is the happiest of all endings for Mr. S., his doctor, and the health of the public.[4]

[4] Information for Health: Report and Recommendations From the National Committee on Vital and Health Statistics, Page 2

6 Data Model

What part does UnitedHealth Care do? We may have to interface with existing systems and allow future alliances to be able to attach to or insert an application module. The system must have an easy to use interface for patients managing all of their requests. The system must be able to be managed remotely and provide secure access and exchange of information while following all regulatory guidelines. The system requires a high adoption rate from patients and healthcare providers.

6.1 Operations/Functions

6.2 Access

- GUI touchscreen terminal
- Swipe card (smart card, mag stripe), RFID, drivers license, name and DOB

6.2.1 Security

6.2.2 Admin

- Remote IP based

6.2.3 Systems Interfaces

- Wireless connectivity
- IP based
- Providers: Practice – Hospital systems
- Insurance provider systems

6.2.4 Applications & Solutions

- Check in
  - ID verification
  - Insurance and benefits verification
  - Possible appt verification
- Consent (minors and information about procedures)
- Transaction processing
  - Pay (co-pay) via credit card
  - Authorize billing for services/meds
- Surveys
- Wayfinding (local)
- Output
  - Print Prescriptions
  - Print Appointment reminders
  - Print Medical care: treatment instructions, diet
  - Notifications
  - Office hours
  - Testing & lab info

6.3 Data Structures

- Personal ID
- Insurance

7 Reference

7.1 EMRs

Electronic Medical Records Primer[5]

A medical record is a confidential record that is kept for each patient by a healthcare professional or organisation. It contains the patient's personal details (such as name, address, date of birth), a summary of the patient's medical history, and documentation of each event, including symptoms, diagnosis, treatment and outcome. Relevant documents and correspondence are also included. Traditionally, each healthcare provider involved in a patient's care has kept an independent record, usually paper based. The main purpose of the medical record is to provide a summary of a person's contact with a healthcare provider and treatment provided to ensure appropriate healthcare.

Information from medical records also provides the essential data for monitoring patient care, clinical audits and assessing patterns of care and service delivery. In the current environment the medical record also forms the first link in the information chain producing the depersonalised aggregated coded data for statistical purposes.

As every health professional, coder, manager and patient knows, considerable effort is invested in writing, filing, sorting, searching, retrieving, issuing and recovering the medical record, in whole or in part. There is no doubt that the ready availability of well organised, legible, accurate and comprehensive clinical notes can play a very significant role in the clinical decision making process and assisting in the provision of quality healthcare.

The medical record should:

- enable health professionals to review previous care events, to reach timely and appropriate clinical decisions, and to develop treatment plans that minimise the risks and maximise the potential benefits to the patient
- provide an archival and legally acceptable record of the steps that were taken - when, why and by whom - in the care of an individual
- enable staff to audit the care provided to an individual
- provide material for researchers studying the aetiology, natural history and cost-effective approaches to treatment of specific conditions
- act as a source of information which will enable various administrative functions of the healthcare service unit (such as contract management or coded statistical returns) to be carried out automatically as a by-product of the clinical data collected
- be stored in such a way as to ensure that the data are secure from loss, alteration or damage

[5] Source: http://www.elmr-electronic-medical-records-emr.com/electronic_medical_record_Primer.htm#01

- be subject to access controls that ensure patient privacy is adequately protected, and that the risk of disclosure to unauthorised persons is minimised.

Given the changes in technology particularly the move to computerised information storage and increasing consumer or patient involvement in healthcare, one issue that must be addressed is whether the existing paper-based medical record remains the most cost-effective way of achieving these goals.

7.2 EHRs[6]

The concept of an EHR--electronic storage and instant availability of information to authorized practitioners--is often combined with the advantages of an electronic healthcare system, including enhanced access to medical information and greater efficiency. EHR promoters even claim that full access to health information might bring cures for certain diseases, such as AIDS.

Healthcare is getting more complex every day. Today, multiple specialists are involved in most patients' healthcare, and paper records cannot keep practitioners completely informed. Records must be available electronically so professionals can review a patient's history, including allergies and medication use, and thereby deliver the best care possible. A survey conducted by the Medical Records Institute, Newton, Mass. (www.medrecinst.com /resources/survey2002 /overview.shtml) shows that providers rank the ability to share information as the No. 1 benefit of EHRs, followed by better quality of care, improved workflow and documentation, and reduction of medical errors.

If EHRs have such an impressive list of benefits and capabilities, why has implementation of full-fledged systems been so slow? The following are four of the most important reasons.

Lack of a framework of standards. The main hurdle for EHRs is the lack of standards in 10 areas:

- Content--for uniformity, compatibility, interoperability
- Information capture--compliance with principles documentation
- Information representation--terminology, code sets, languages
- Operational dimension and data model--allocation, deployment, staging, routing
- Clinical practice--protocols, problem management
- Decision support--algorithms, triggers, logical support
- Security/confidentiality--authentication, accountability, data integrity, encryption
- Performance--measures, for example, of acceptable downtime
- Interoperability--translation modules, versioning, domains
- Quality assurance and system testing

Progress in these areas ranges from 45 percent (data content) to 60 percent (authentication), with many standards organizations working on sections of the

[6] Source: http://www.healthcare-informatics.com/issues/2003/05_03/cover_ehr.htm

framework. Ann Arbor, Mich.-based Health Level 7 is very active in the clinical messaging field, and ASTM Committee E31 (healthcare informatics) is working on security standards, among other things. But clearly, it will be a while before all standards are in place for a fully interoperable paperless EHR.

Lack of motivation. A patient's EHR was initially envisioned as a lifetime record of all health information--from the dentist to the psychiatrist, from the clinic to the hospital. But there is little interest in creating interoperability with, for instance, a competing clinic or hospital. Since direct benefits can be obtained with interoperable patient information systems enterprisewide, such as a clinic, physician organization, hospital, health plan or other provider organization, most activities toward an electronic record are limited to the enterprise.

The EHR benefits mentioned are for the healthcare system. Providers are concerned with return on investment, but gains from EHRs are in patient safety and efficiencies rather than in tangible and measurable financial terms.

Lack of direct benefits for practitioners. Most EHR systems require practitioners to do more computer input and less handwriting. Many perceive writing short notes as easier and, in the short term at least, more cost-effective. For example, an order entry application by computer may take twice as long as writing or dictating an order.

But this hurdle is slowly being overcome. Systems are becoming easier to use and more intuitive. More practitioners are realizing that indirect benefits, such as alerts and medication management, may compensate for the time required. Mobile health systems are providing point-of-care computing in examination rooms and during rounds that offer significant direct benefits.

Confusion about the concept. EHRs are known by various terms, each indicating a specific vision that differs from the others (see "Electronic Patient Care Terms and the Visions They Represent" at left). Ten years ago, the vision of the computer-based patient record (CPR) was in vogue. Today, most provider organizations are working on enterprisewide electronic medical records (EMRs).

While EHR seems to be accepted globally as the generic term for the vision of electronic patient care systems, terms such as CPR continue to be used in some circles, adding to the confusion.

EHRs enable data sharing through electronic information exchange, and they support the trend toward uniform documentation and better information management. A major source of medical errors is the pen. Handwriting allows illegible prescriptions and documentation, personalized shorthand entries, and medication orders that may result in side effects or drug interactions.

Even so, the key benefit of EHRs is not that they require computer entry but that they streamline processes. The most successful EHR systems improve workflow and efficiencies, enabling better management of the patient care process.

7.3 Electronic Patient Care Terms and the Visions They Represent[7]

EHR (electronic health record) Generic term for all electronic patient care systems

CPR (computer-based patient record) Lifetime patient record that includes all information from all specialties (even dentist, psychiatrist) and requires full interoperability (potentially internationally); unlikely to be achieved in foreseeable future

PCR (patient-carried record) All information contained on a token or card that patient carries; most pilots and demonstration projects have been discontinued

CMR (computerized medical record) Any document imaging-based system

EPR (electronic patient record) Similar to CPR but not necessarily containing a lifetime record and not including dental, behavioral, or alternative care; focuses on relevant information

EMR (electronic medical record) Electronic record with full interoperability within an enterprise (hospital, clinic, practice)

DMR (digital medical record) Web-based patient record using "pull" technology (minimum of messages)

PMRI (patient medical record information) Used in Department of Health and Human Services/National Committee on Vital and Health Statistics language

PHR (personal health record) Managed and controlled by patient; mostly Web-based

ICRS (integrated care record services) Term used in United Kingdom

[7] Source: http://www.healthcare-informatics.com/issues/2003/05_03/cover_ehr.htm