

Federal Health IT: Focus on VistA

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Agenda

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- **Importance of Health Information Technology (HIT)**
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US Healthcare Market and Challenges



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U.S. Health Care Market



The WHO ranked US healthcare 37th out of 191 countries

- Population: 293,027,571 (2004)
- Health Expenditure: 15.4% (2004)
- Health Expenditure: \$1,805 billion (2004)
- Population Growth: .92%
- Average Length of Stay: 5.7 days
- # of Hospitals: 5,764 (2003)
- Hospital Beds: 976,000 (2004)
- Beds/ 000 population: 3.3
- Doctors/ 000: 2.8

Source: Frost & Sullivan, CIA Factbook, Espicom, AHA, OECD Health Data 2003 & California Healthcare Foundation 2005



Health Care Challenge

- The American healthcare system needs a major reform because it has many challenges that are hard to resolve:
 - **Cost**
 - US spends around 14% of gross domestic product on healthcare (estimated to rise up to 20% by 2010) — other advanced nations spend an average of 8%
 - **Quality/Value**
 - Commonwealth Fund study measuring quality of care in five nations reported that America was superior in only a few
 - This study indicates that Americans spend more but receive less value
 - **Access**
 - “Access” refers to the ease with which people can obtain the care they need
 - Access problems are caused by lack of coverage from insurance, high co-payments, lack of providers in certain areas, etc.
 - **Effectiveness**
 - Even though some experts say that the benefits outweigh the cost in such areas as heart disease and low-weight newborns — others argue that there is a lot of waste in the health care system, which results in ineffective service
 - Bill Frist in a statement said that one third of \$1.8 trillion spending is wasted due to disorganization and lack of information



Potential Solutions

- There are no easy answers to solve healthcare issues, but — use of Healthcare Information Technology (HIT) is one such solution
- Institute of Medicine reports – identified HIT as one of four critical forces that could significantly improve health quality
- Healthcare has been a top issue on the Presidential agenda and for the Federal Government

“ By computerizing health records, we can avoid dangerous medical mistakes, reduce costs and improve care”

— President George W. Bush, January 2004, State of the Union Address

Importance of Health Information Technology (HIT)



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HIT

- Presidential Information Technology Advisory Committee (PITAC) report, **Transforming Health Care through Information Technology**, proposed a framework for the 21st century health care information infrastructure with four essential elements:
 - Electronic Health Records (EHRs)
 - Computer-assisted Clinical Decision Support (CDS)
 - Computerized Provider Order Entry (CPOE)
 - Secure, private, interoperable, electronic information exchange

- Private industry coalitions (e.g., Leapfrog Group),
 - Health Information Technology (HIT) as one of the key elements in reducing errors and deploying evidence-based medicine -- CPOE



HIT and QA Improvement

- Focus on Pay-for-Performance based on quality improvement in care delivery process
 - CMS pay-for-performance program
 - Bridges to excellence
 - Evaluate8
 - Insurance companies – Blue Cross Blue Shield plans
- Measuring quality and outcomes is not possible without use of technology



HIT and ONCHIT

- Office of National Coordinator for Health Information Technology (ONCHIT) was established: Dr. David J. Brailer was appointed to that position
- Dr. David J. Brailer, in July 2004, presented ***Framework for Strategic Action for Delivering Consumer-centric and Information-rich Health Care*** with four key goals:
 - Goal 1 – Inform Clinical Practice – use of EHR
 - Goal 2 – Interconnect Clinicians – networks for data sharing
 - Goal 3 – Personalize Care – use of PHR
 - Goal 4 – Improve Population Health – leveraging networks and data sharing for bio surveillance and others



Value of HIT

- Nationally, the benefits of HIT have been quantified and documented in several areas*:
 - Decision support tool to deploy evidence-based medicine at point of care – savings of \$350 – 600 per patient per year
 - e-Prescribing – savings of up to \$27 billion per year
 - Computerized provider order entry (CPOE) – savings of up to \$ 40 billion per year
 - Electronic health record (EHR) – savings of up to \$86,500 per provider over 5 years
 - Creation of Regional Health Information Organizations (RHIO) – benefits 3 times the costs
- Recent study from CITL reported that use of technology can save American healthcare system \$70 billion

* Various research and studies

Need for a National EHR



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Evolution of an EHR

- From CPR to EMR to EHR ----- PHR
 - Computer-based patient record (CPR) systems started it all
 - Concept started in the 80's
 - IOM publication – The Computer-Based Patient Record: An Essential Technology for Health Care in 1991 caused the momentum
 - This was often a longitudinal record that captured paper-based information in an image format for later reference
 - Electronic Medical Record
 - CPR and more
 - Owned by a single provider organization
 - Captures and manages data that originates in electronic form
 - Electronic Health Record
 - Beyond the level of any single, proprietary information system
 - True, lifetime medical record
 - Personal Health Record
 - Record owned by the patient collecting data across multiple providers

* Healthcare Informatics; Electronic Medical Records – Why their time has come



Need for an EHR

- 20% to 25% of the nation's doctors outside of the military and the Department of Veterans Affairs are using EHRs
- 33% of surveyed hospitals reported having PACS installed*
- 10% of surveyed hospitals have CPOE systems installed*
- 62% of US hospitals state that IT investment was a top priority
- * 2004 HIMSS Analytics database of 4000 hospitals surveyed and Commonwealth Fund International Health Policy Survey (2003).



Need for an EHR

Medical Errors

- Medical errors result in more deaths than motor vehicle accidents, breast cancer and AIDS equating to 44,000-98,000 deaths annually. *

Two examples of handwritten medical orders on paper forms, labeled #1 and #2, illustrating medical errors.

#1

TREATMENTS, MEDICATIONS, ETC. - 3
FOR ANTIBIOTIC ORDERS CHECK THE APPROPRIATE BOX
☐ SURGICAL PROPHYLAXIS ☐ TREATMENT ☐ NON-SURGICAL PROPHYLAXIS

1. TIME DATE

2/25/01 5:00 pm 9:00 am
24 (1000mg) Dabed
initially use
2) 1000mg, daily?

PHYSICIAN I.D. NUMBER SIGNATURE OF PHYSICIAN M.D.
SIGNATURE OF TRANSCRIBER DATE TIME SIGNATURE OF NURSE (NITE)

#2

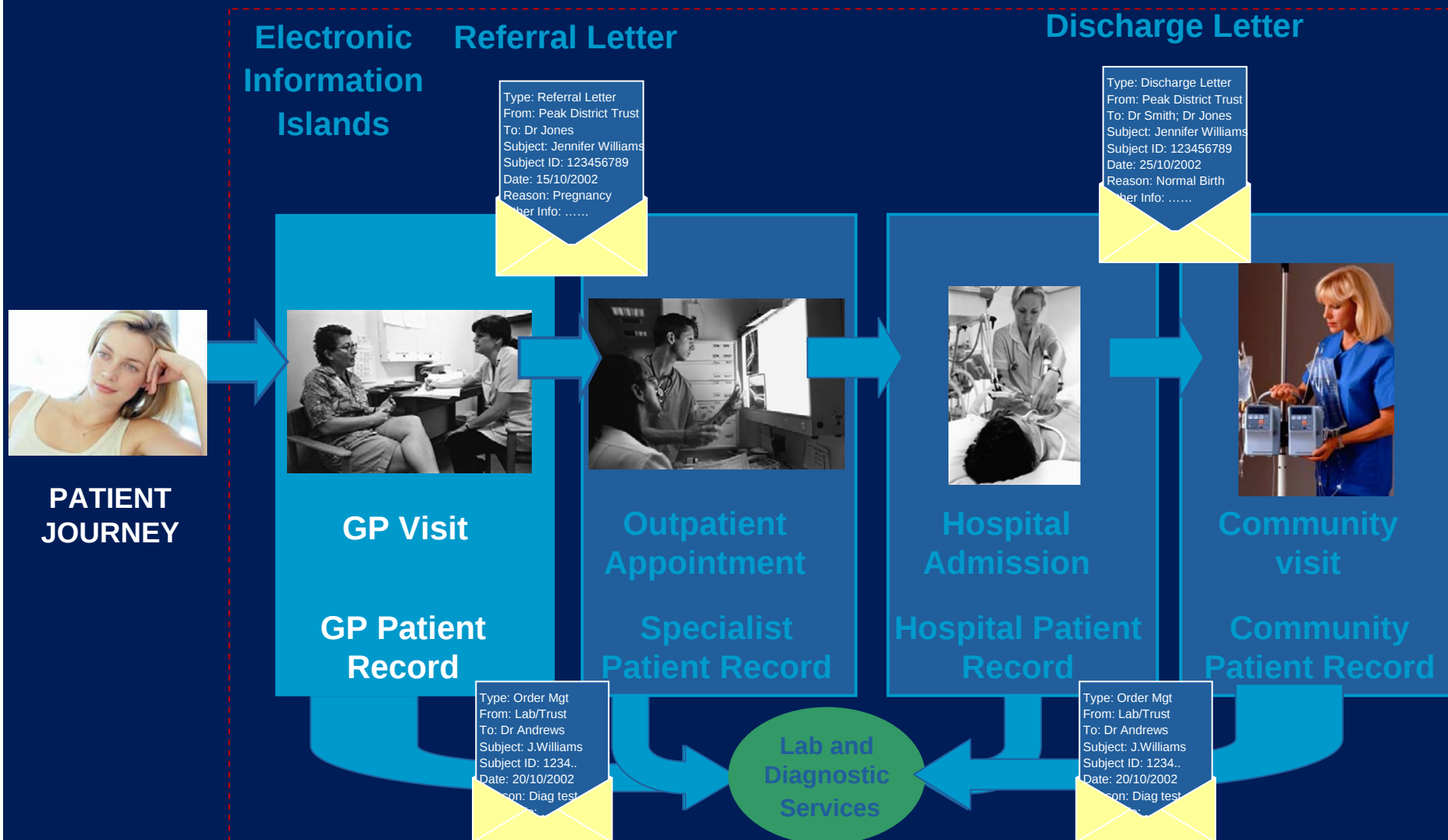
TREATMENTS, MEDICATIONS, ETC. - 3
FOR ANTIBIOTIC ORDERS CHECK THE APPROPRIATE BOX
☐ SURGICAL PROPHYLAXIS ☐ TREATMENT ☐ NON-SURGICAL PROPHYLAXIS

3/10/01 Keflin 10g po qaw -
call mg
any time after 9 am
2) ceftriaxone 2g po q 6 pm

PHYSICIAN I.D. NUMBER SIGNATURE OF PHYSICIAN M.D.
SIGNATURE OF TRANSCRIBER DATE TIME SIGNATURE OF NURSE (NITE)

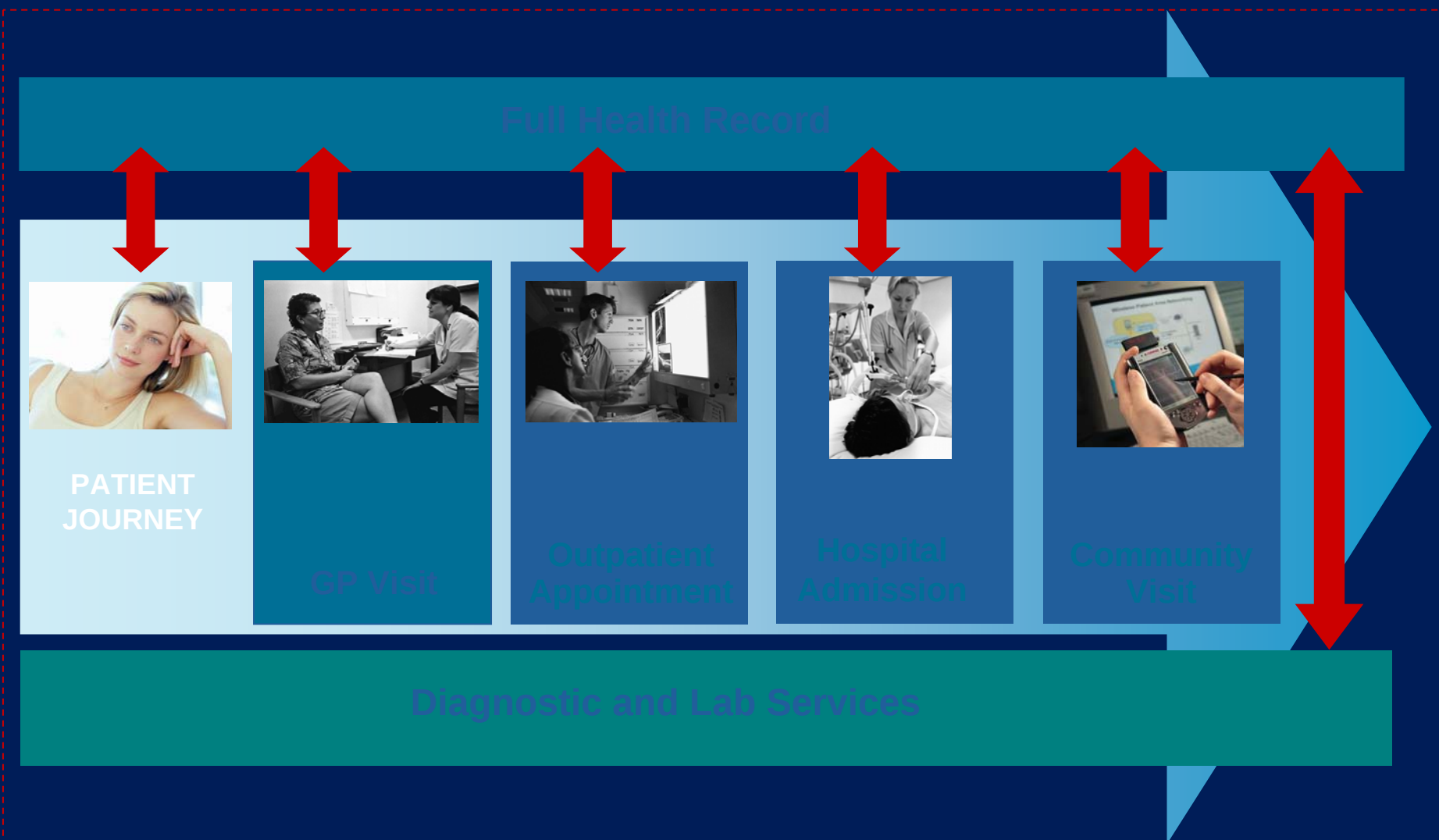


Patient Journey - today





Patient Journey - Future





Need for an EHR

Aging Workforce/Knowledge Management

- Over the next 25 years 76 million baby boomers will retire.
- National healthcare is predicted to rise to 2.7 trillion in 2010.
- In 2001 over 168,000 hospital jobs were unfilled. 11% were registered nursing jobs.*
- Source: American Hospital Association



Need for an EHR

Workflow Inefficiencies

- Over 90% of all claims for healthcare reimbursements are wrong. This is putting pressure on providers to improve workflow efficiencies.

- Source: American Hospital Association



Nine Technology Trends

Significant Healthcare technology trends for 2005:

1. Bar Coding and RFID
2. Disease Management
3. Electronic Health Record
4. Emergency Preparedness
5. Integrating PACS
6. IT and Biomedical Devices
7. Patient-Centric Portals
8. Regional Networks
9. Telehealth

* Healthcare Informatics February 2005 Issue



Health Care CIO Trends

Eight key priorities for CIO's for 2005 -- based upon Healthcare Information and Management Systems Society (HIMSS) Leadership Survey:

1. Reduce Medication Errors / Promote Patient Safety (2)
2. Upgrade Security / HIPAA Compliant (1)
3. Replace/Upgrade Inpatient clinical Systems (3)
4. Implement Wireless Systems (4)
5. Process/Workflow Design (7)
6. Connect IT at Hospital and Remote Locations
7. Implement an EMR (5)
8. Train Personnel to Use Systems

www.himss.org/2005survey/docs/healthcare_cio_key_trends.pdf

Federal Health IT Projects



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Federal Health EHR Projects

- Department of Veterans Affairs
 - Veterans Health Administration
 - VistA, VistA Imaging and BCMA
 - Federal Health Information Exchange (FHIE)
 - VistA outside the VA
- Department of Defense
 - Army Medical
 - CHCS, CHCS-II
 - Federal Health Information Exchange (FHIE)
- Health and Human Services
 - Indian Health Services
 - RPMS
 - Centers for Medicare and Medicaid Services (CMS)
 - VistA-Office EHR
 - ONCHIT
 - National Health Information Network (NHIN)
- Government wide grants available for Health IT projects

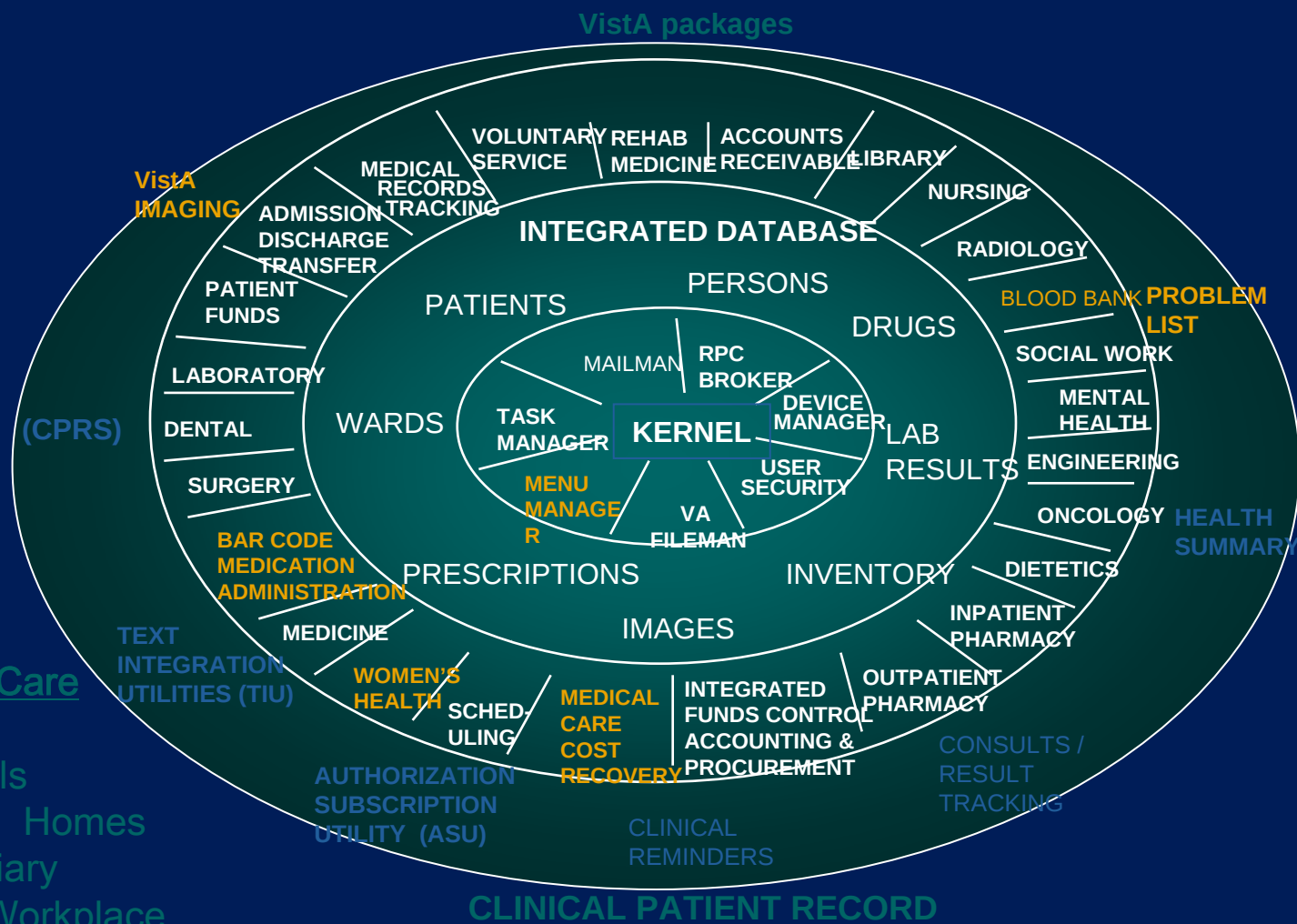
About VistA



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About VistA



Sites of Care

- Clinics
- Hospitals
- Nursing Homes
- Domiciliary
- Home/Workplace



About VistA





About VistA

Comprehensive

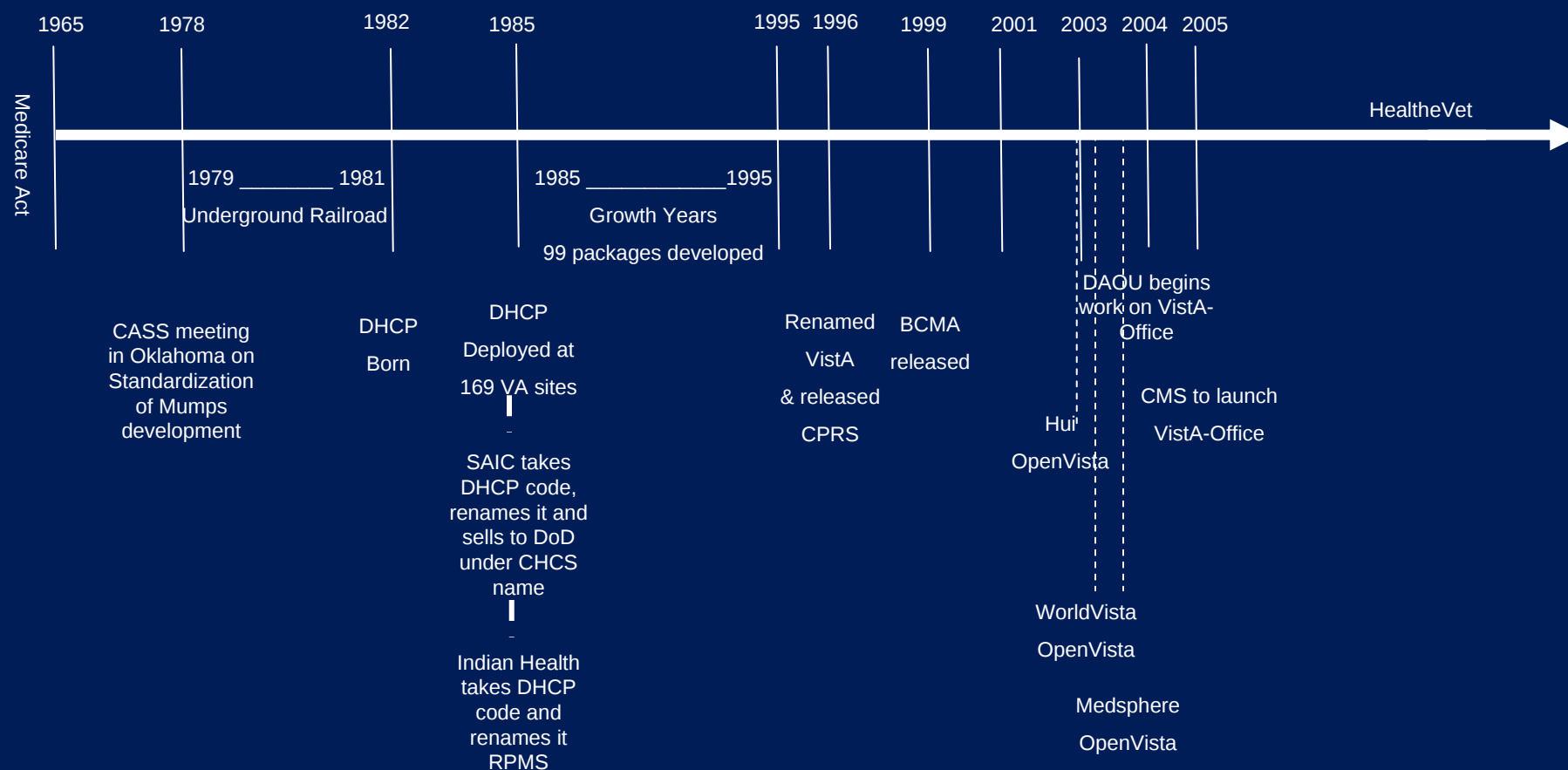
- Contains over 100 applications to address the clinical, financial and administrative needs of healthcare organization
- Designed for acute, ambulatory and long term care environments

Proven

- Currently deployed at over 157 Medical Centers, 850 Clinics (1007 sites) on 180,000 PCs and thin clients
- Supports 15,000 Physicians, 56,000 Nurses and 33,000 health professionals
- Processes over 698M documents, 1.4B Orders, 338M Images, 863M Vital Sign Measurements and 670M Medication Administrations (BCMA) Yearly
- 85% of all physicians trained in the US exposed to the system



VistA History



VistA Versions



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VistA Versions

DoD's - Composite Health Care System (CHCS) Public Domain

- Easy Objects – Encapsulation Technology
- Enhanced User Interfaces
 - Naval Hospital 21st Century
 - CHCS II – Thick Client

Indian Health - Resource and Patient Management System (RPMS) – Public Domain

- Developed their own User Interface – RPMS
- Developed new functionality – Pediatrics, OB/Gyn
- Mailgrams
 - RuleMan
 - Variable Pointers



VistA Versions

• CMS's VistA-Office -Public Domain

VistA-Office EHR will build on the existing VistA functions, including order entry, documentation, and results reporting, by including the following key enhancements:

- Support for disease management in areas such as hypertension, coronary artery disease, and diabetes
- Enhanced registration process to meet the needs of the non-veteran population
- Enhanced functionality for Obstetrics/Gynecology (OB/GYN) and Pediatrics care
- Interface with practice management and billing systems
- DOQ-IT warehouse connectivity
- Improved installation procedures to allow non-IT experts the ability to download, install, and configure VistA-Office EHR
- Standards-based interface specifications for:
 - Lab systems
 - Pharmacies
 - Practice Management Systems
 - Billing Systems



Other VistA Versions

- **Medsphere's OpenVista – Enhanced version of the VistA**
 - Developed 1st open source version of EHR with Hui
 - Has created improved GUI and simpler technology platform
 - Has added a number of improvements to system
- **Pacific Hui's OpenVista – Open Source GPL Licenses**
 - Developed 1st open source version of EHR which was then adopted by WorldVista at version 4.X
 - Changes made were specific to database (GTM vs. Cache) and put on Linux.
- **WorldVistA's OpenVista – Open Source Apache License**
 - Took Hui 4.X code and has been modifying it to incorporate other packages to include – Pediatrics, OBYN, etc.
- **Bluecliff OpenVista**
 - Took Hui 4.X code and modified to be put up as a ASP model.

Adoption of HIT & Opensource



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Adoption of HIT & Opensource



Public Domain vs. Opensource

- **Public Domain**

- Public domain refers to the total absence of copyright protection for a creative work (such as a book, painting, photograph, movie, poem, article, piece of music or computer program).
- Public domain works (i.e., works in the public domain) are considered to be a part of the public's cultural heritage, and thus anybody is entitled to make use of them for any purpose, including copying, modifying and even selling, including with a restrictive license such as a EULA (End User License Agreement). Moreover, one can even remove the original author's name and treat it as their own work. The only restrictions that apply to public domain works are those that apply to goods and services in general, such as those concerning safety, libel and exports

- **Open Source**

- “The basic idea behind open source is very simple: When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves. People improve it, people adapt it, people fix bugs. And this can happen at a speed that, if one is used to the slow pace of conventional software development, seems astonishing.
- We in the open source community have learned that this rapid evolutionary process produces better software than the traditional closed model, in which only a very few programmers can see the source and everybody else must blindly use an opaque block of bits.” [\[1\]](#)

[\[1\]](#) Open Source Initiative, <http://www.opensource.org>



Adoption of HIT and OSS

- Adoption of HIT has been slower because of:
 - High Cost
 - Limited availability of capital resources
 - Lack of value in physician offices
- Healthcare providers need a comprehensive clinical information system that is affordable
- Open Source software offers solutions that are:
 - Affordable
 - Reliable
 - Viable
- Open source software market is growing in public and private sector
 - Many Federal agencies are leading the effort as well as deploying OSS
 - Acceptance in health care is growing



Adoption of OSS

- Growth of OSS is occurring in all software categories
 - Operating system – Linux
 - Web servers – Apache
 - OpenOffice
 - Support from major software companies – IBM, HP, Novell and others
- Key barriers for adoption of OSS identified by Dan Farber in 2004 were:
 - Lack of formal support
 - Velocity of change
 - Lack of roadmap
 - Functional gaps
 - Licensing caveats
 - Lack of peer endorsements Some of these still exist
- OSS has been successful as infrastructure solution; but needs more validation as a solution for enterprise-level applications



Adoption of OSS

- Health care being a risk averse industry has lagged behind adoption of OSS:
 - Complexity of health care applications
 - Support for regulatory changes
 - Someone to share the risk
 - Ability to integrate
 - Lack of references
- Some industries are ahead of health care
 - Entertainment
 - Telecommunications
 - Financial
- Landscape is changing
 - “the next wave in open source development is applications.....” Larry Augustine, CEO Medsphere Systems
 - CMS and HHS support is making OSS solutions viable to health care and providing a cost effective solution

VistA Infrastructure



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VistA Infrastructure

Generic Components	Possibility 1	Possibility 2	Possibility 3
CPRS	CPRS	CPRS	CPRS
VistA	VistA	VistA	VistA
Database	Cache	Cache	GTM
Operating System	OpenVMS	Windows 2003	Linux
Hardware	Alpha/Itanium	IA32/IA64	IA32/IA64



VistA Infrastructure

Other Mix and Match Platforms

OS

- Linux
- Windows OS
- OpenVMS*

Database

- Sanchez G.TM
- Oracle
- Cache*

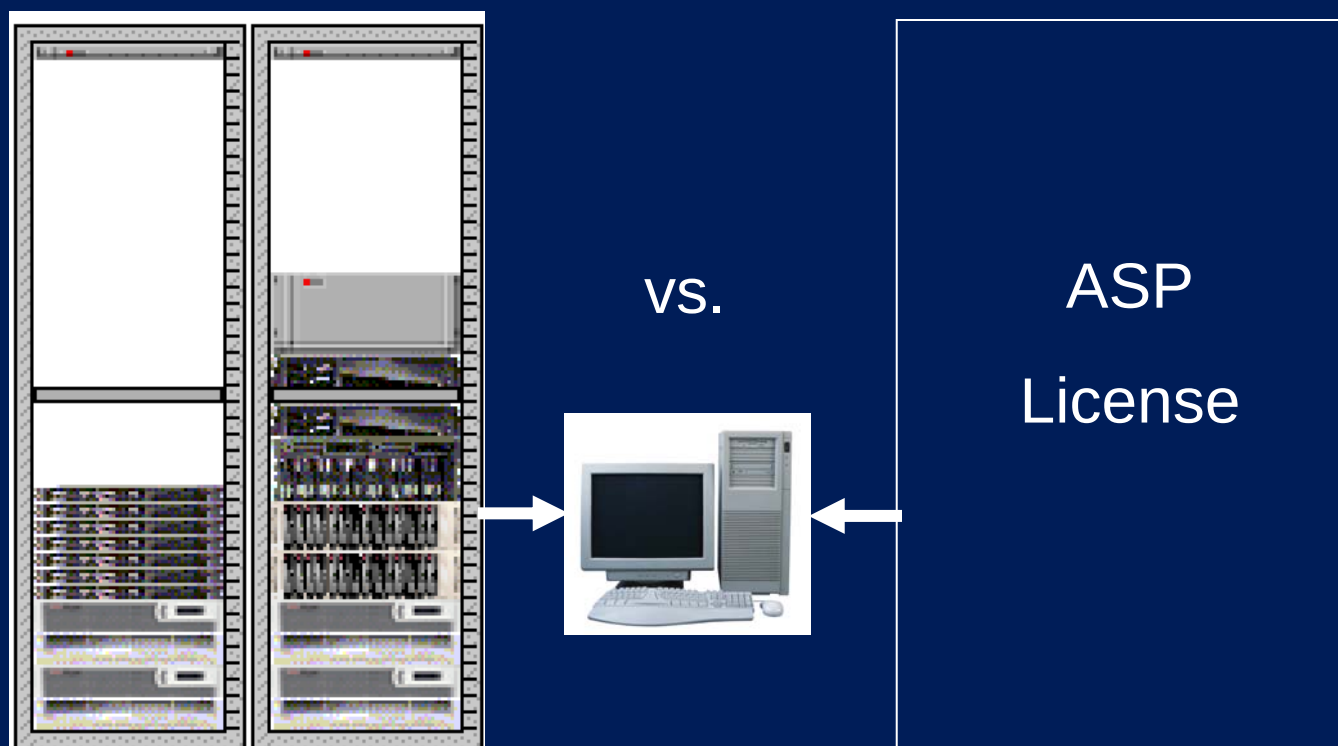
Hardware

- Laptop
- Client/Server with Thin Clients*



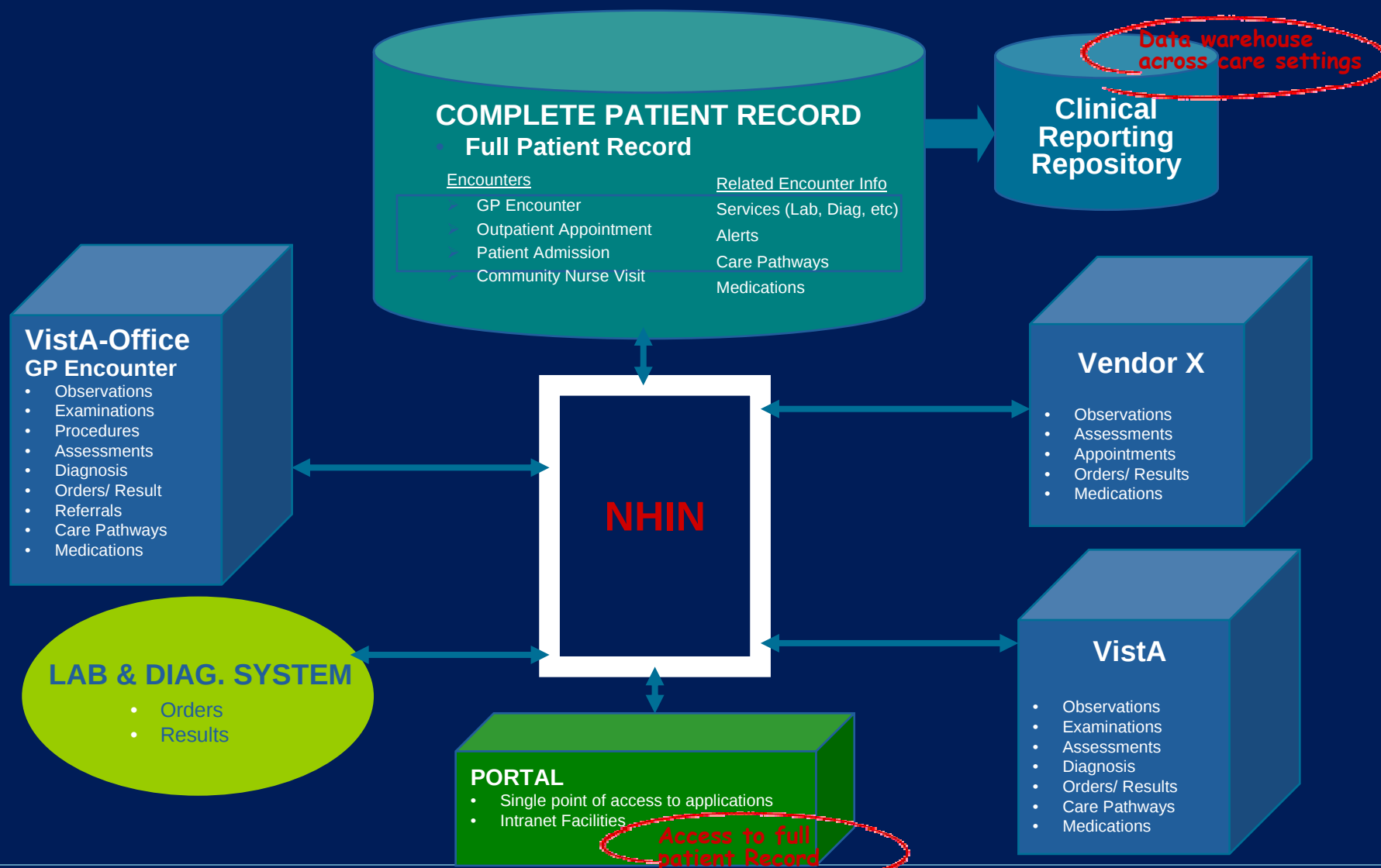
VistA Support Models

Server vs. ASP





VistA Connects to NHIN



Success and Failures



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VistA Implementations in the US

Specific Examples include :

- Department of Veterans Affairs (1007 sites-CONUS/OCONUS)
- Department of Defense (105 sites CONUS/OCONUS)
- Indian Health
- Presbyterian Health Service, Albuquerque, NM
- Oklahoma Department of Veterans Affairs (8 sites)
- Midland Memorial Hospital (9 sites)
- West Virginia--- the Bureau of Behavioral Health and Health Facilities
- Washington State—has implemented and been successful in using VistA at three facilities over the past decade, (Western State Hospital, Tacoma, Child Study & Treatment Center, Tacoma. and Eastern State Hospital, Spokane).



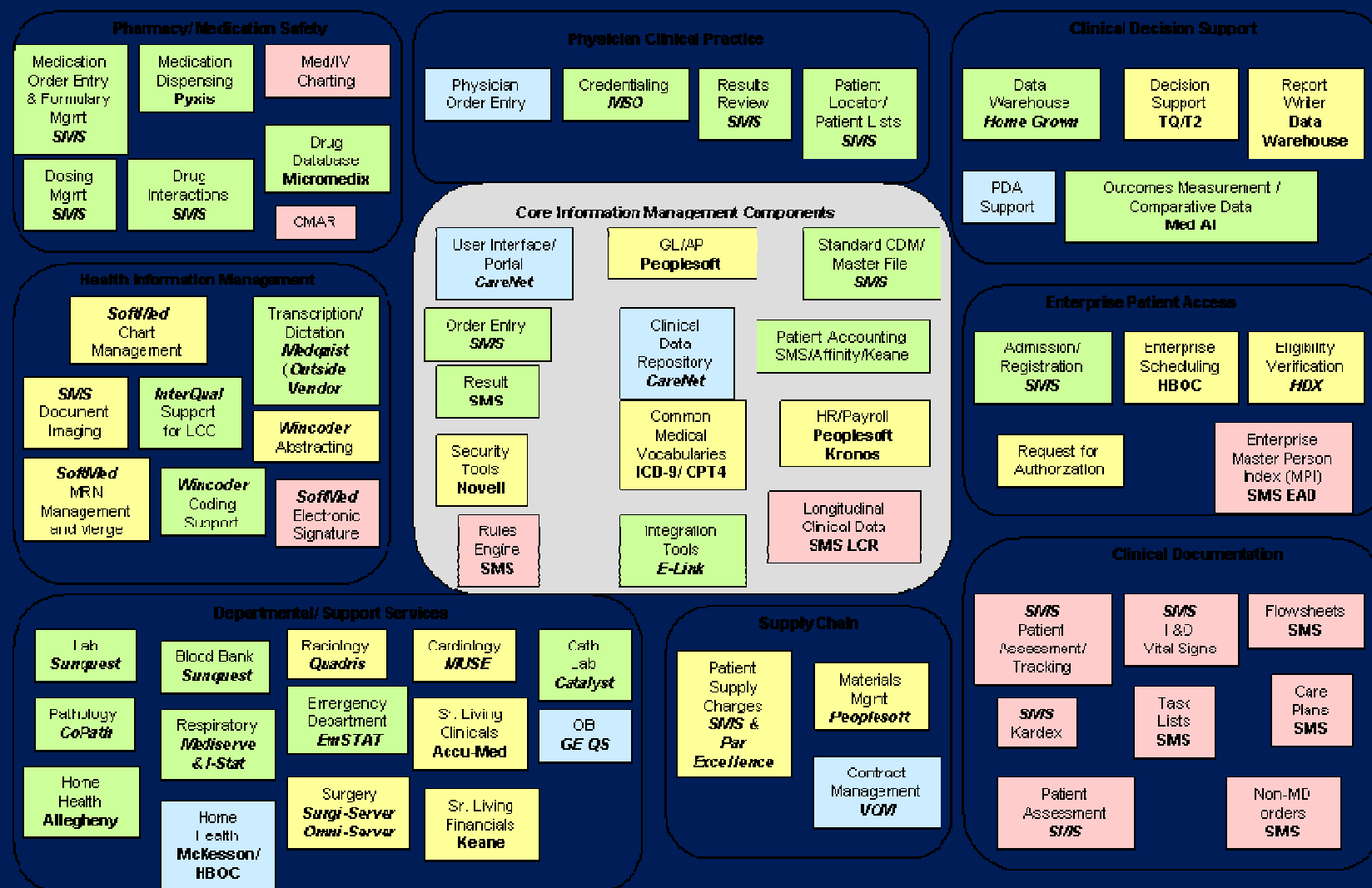
VistA Implementations Worldwide

Specific Examples include :

- American Samoa
- German Heart Institute, Berlin
- Government hospitals in Bogota, Colombia
- Helsinki University Hospital
- Nakasero Blood Bank in Kampala, Uganda
- National Cancer Institute, Cairo
- Obafemi Awolowo University Teaching Hospitals, Nigeria
- SKM Cancer Hospital and Research Centre, Pakistan
- University Hospital of Kuopio, Finland
- University of Wurzburg, Germany
- World Health Organization's Collaborating Center on AIDS and Sexually Transmitted Diseases, University of Nairobi School of Medicine
- XORS Inc. (Czech Republic)



Overview of an Implementation



Maximum Utilization Moderate Utilization Purchased - Not Implemented In Progress



EHR Implementation Failures

- Both vendors and providers have commented that a large number of implementation failures exist in the industry typically as a result of poor vendor support and training. These failures impact the adoption rate of IT in the healthcare arena including EHR adoption.
- Examples:
 - VA's CoreFLS
 - CalRHIO's SantaBarbara Project
 - Cedar Sinai's implementation of CPOE system



Change Management for EHRs

- Major barriers to growth in clinical IT is resistance to change
 - Lack of leadership that are active in seeing project through
 - Physicians/Nurses perceive EHR implementation will require time and training beyond their already heavy workloads
 - Implementation is disruptive and likely to impact care
 - No incentives to make change
 - 15% of hospitals lack IT staff and technology experts
 - >90% of physician's offices do not have IT departments
 - Negative experience with IT vendors (hidden fees)
 - Fear of losing patients due to increase in patients switching providers (e.g. cell phone #'s)



Implementation Key Criteria

1. Executive Sponsorship
2. Involvement of key stake holders right from the beginning
3. Focus on Change Management not just technology
4. Well defined project plan with milestones and critical path
5. Accountability and process to make timely decisions
6. Risk mitigation – can't eliminate risks; have to manage it
7. Defining the vendor performance and monitoring it
8. Assignment of requisite resources
9. Managing the expectation setting
10. Communication, communication, communication

It is a marathon not a sprint



Contacts

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Links

VistA-CPRS Demo - <http://www1.va.gov/CPRSdemo/>

CMS - VistA Office EHR –
<http://www.cms.hhs.gov/quality/pfqi.asp#Vista-Office%20EHR>

Indian Health - RPMS - <http://www.ihs.gov/Cio/RPMS/index.cfm>

DoD - CHCS <http://www.tricare.osd.mil/peo/citpo/projects.htm>

Pacific Hui - <http://www.pacifichui.org/>

WorldVistA - <http://www.worldvista.org>

Hardharts.org - <http://www.hardhats.org/>

Vista Software Alliance- <http://www.vistasoftware.org>



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2. Weber, David Ollier, *"EHRs are not plug-and-play. The physicians and the staff have to invest themselves in it,"* The Physician Executive, July-August 2005, pg 9-10.
3. Brief Report of the AAFP's EHR Pilot Project: Key Learnings from Six Small Family Practices American Academy of Family Physicians, Center for Health information Technology, March 8, 2005
http://www.sharpworkgroup.com/presentations/chit_pilotresults.pdf
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5. [The Best Care Anywhere](#), Washington Monthly, January/February, 2005. http://www1.va.gov/cprsdemo/docs/Article_Washington_Monthly_Jan_Feb_2005.doc
6. Brown, Lincoln, Groen, Kolodner, "VistA – US Department of Veterans Affairs National Scale HIS," International Journal of Medical Informatics. February 2003 http://www1.va.gov/cprsdemo/docs/VistA_Int_Jrnl_Article.pdf
7. Munnecke, Tom, "Personal Health: From Systems to Space," July 19, 2002



NHIN Reading

1. U.S. Department of Health and Human Services Office of the National Coordinator for Health Information Technology, "Summary of Nationwide Health Information Network (NHIN) Request for Information (RFI) Responses" June 2005 <http://www.hhs.gov/healthit/rfisummaryreport.pdf>.
2. United States Government Accountability Office, Report to the Chairman, Committee on the Budget, House of Representatives, HEALTH INFORMATION TECHNOLOGY, "HHS Is Taking Steps to Develop a National Strategy," May 2005 <http://www.gao.gov/new.items/d05628.pdf>



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