HIMSS CPHIMS
Certified Professional in Healthcare Information & Management Systems

Review Course

HIMSS does not guarantee completion of the CPHIMS Review Course will ensure passing results attaining the CPHIMS certification.

© 2015 by the Healthcare Information and Management Systems Society.

All rights reserved. No part of this publication may be reproduced, adapted, translated, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Requests for permission to reproduce any parts of this work should be sent to:
CPHIMS Review Course
HIMSS
33 E. Monroe St., Suite 1700, Chicago, IL 60603
certification@himss.org

HIMSS
transforming health through IT

HIMSS CPHIMS
Certified Professional in Healthcare Information & Management Systems

Review Course

8:00 am – 5:00 pm
May 2, 2016

Coralville Marriott Hotel & Conference Center
Coralville, IA

HIMSS
transforming health through IT

Congratulations!

By attending this review course and seeking to earn the CPHIMS certification, you have taken the first step in demonstrating that you have a solid grounding in the principles of health IT.

HIMSS
transforming health through IT

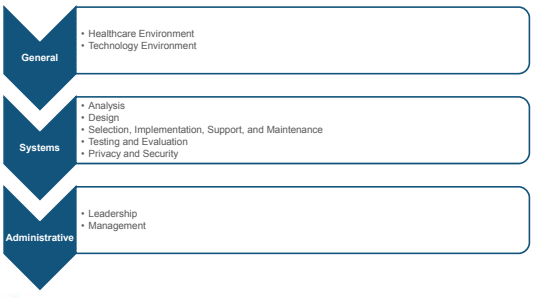
Distinguish Yourself

- CPHIMS is a professional certification program for healthcare information and management systems professionals.
- Distinguish yourself in an increasingly competitive marketplace
- Expand your career opportunities
- Validate your knowledge, competency and credibility
- Gain skills and tools to help you make a difference in your organization, and your community
- Demonstrate your commitment to continuing professional development

Learning Objectives

- Explore components of the CPHIMS competency areas
- Review components of the implementation and System Development Life Cycle in a healthcare setting
- Discuss the importance of the many administrative aspects of Health Information Technology including essential leadership skills.

CPHIMS Competency Areas



CPHIMS Competency Areas

General

- Healthcare Environment

1. **Articulate** characteristics and services of different types of healthcare organizations (e.g., hospitals, clinics, ambulatory centers, community health organizations, healthcare payers, regulators, research and academic)
2. **Articulate** characteristics of interrelationships within and across healthcare organizations (e.g., health information exchange, public, private, continuity of care)
3. **Differentiate** the roles and responsibilities of healthcare information and management systems professionals within the organizational structures in which they work
4. **Describe** roles of governmental, regulatory, professional, and accreditation agencies related to healthcare and their impact on clinical outcomes and financial performance

CPHIMS Competency Areas

General

- Technology Environment

1. **Articulate** characteristics of applications commonly used in healthcare (e.g., clinical, administrative, financial, consumer, business intelligence)
2. **Articulate** characteristics of technology infrastructure that support the healthcare environment (e.g., network, communications, data integration, privacy and security)

CPHIMS Competency Areas

Systems

- Analysis

1. **Define** the problem or opportunities
2. **Conduct** a needs analysis
3. **Define** requirements
4. **Prioritize** requirements
5. **Analyze** current business and clinical processes (e.g., process mapping, flow diagramming, gap analysis)
6. **Formulate** alternate processes and potential solutions
7. **Evaluate** if a proposed solution aligns with the organization's strategic and operational plans
8. **Perform** cost-benefit analysis to evaluate impact on issues related to healthcare systems (e.g., customer satisfaction, patient care quality, economics, access to care, business process improvement)
9. **Develop** proposals that include recommended approaches and solutions, and plans for realizing benefits
10. **Present** interpretations and recommendations of data analyses to decision makers

CPHIMS Competency Areas

Systems

- Analysis

11. **Manage** projects and/or resources, including:
    a. assessing resource requirements (e.g., space, personnel, environmental, communication, productivity
    b. utilizing project management skills and tools
    c. conducting a risk assessment
    d. facilitating project status and business value assessments
    e. facilitating change management
    f. controlling scope, schedule, and budget of project
    g. maintaining project materials and documentation
    h. developing implementation strategies
12. **Promote** and apply:
    a. problem solving and quality improvement methodologies
    b. analytical tools to optimize systems function
    c. organizational change management techniques
13. **Understand** the roles and responsibilities of health professionals and the associated workflow in the environments where they work
14. **Analyze** future trends in healthcare and technology to anticipate how technology and IT services evolve to meet changing needs
15. **Perform** gap analysis to evaluate where current systems can be enhanced

HIMSS transforming health through IT

CPHIMS Competency Areas

Systems

- Design

1. **Identify** system designs to accommodate business processes
2. **Develop** requests for information and/or requests for proposals
3. **Ensure** compatibility of software, hardware, network components, and medical devices
4. **Ensure** compliance with applicable industry, regulatory, and organizational standards
5. **Ensure** a process exists to incorporate industry, technology, infrastructure, legal and regulatory environment trends
6. **Design** an information infrastructure that supports current and anticipated business needs (e.g., business continuity, disaster recovery)
7. **Evaluate** existing and emerging technologies to support organization's future growth and strategy
8. **Employ** data management practices

HIMSS transforming health through IT

CPHIMS Competency Areas

Systems

- Selection, Implementation, Support, and Maintenance

1. **Facilitate** solution selection criteria
2. **Select** and review team members
3. **Conduct** solution selection activities (e.g., demonstrations, site visits, reference checks)
4. **Employ** organizational change management techniques in support of solution implementation
5. **Provide** knowledge transfer through user and operational manuals and training
6. **Execute** the implementation of solutions
7. **Manage** healthcare information systems (e.g., operate, upgrade)
8. **Analyze** data for problems and trends (e.g., error reports, help desk logs, surveys, performance metrics, network monitoring)
9. **Prioritize** issues to ensure critical functions are repaired, maintained, or enhanced
10. **Incorporate** solution into organizational disaster recovery and business continuity plans
11. **Develop** system and personnel downtime procedures

HIMSS transforming health through IT

CPHIMS Competency Areas

Systems

- Testing and Evaluation

1. **Design** a formal testing methodology to demonstrate that solutions meet functional requirements (e.g., unit test, integrated test, stress test, acceptance test
2. **Implement** internal controls to protect resources and ensure availability, confidentiality, and integrity during testing (e.g., security audits, versioning control, change control)
3. **Validate** implementations against contractual terms and design specifications
4. **Corroborate** that expected benefits are achieved (e.g., return on investment, benchmarks, user satisfaction)

HIMSS

CPHIMS Competency Areas

Systems

- Privacy and Security

1. **Participate** in defining organizational privacy and security requirements, policies and procedures
2. **Assess** privacy and security risks
3. **Mitigate** privacy and security vulnerabilities
4. **Ensure** user access control according to established policies and procedures
5. **Ensure** confidentiality, integrity, and availability of data
6. **Define** organizational roles (e.g., information security, physical security, compliance)
7. **Develop** data management controls (e.g., data ownership, criticality, security levels, protection controls, retention and destruction requirements, access controls)
8. **Validate** disaster recovery and business continuity plans
9. **Coordinate** privacy and security audits
10. **Validate** security features in the evaluation of existing and new systems

HIMSS

CPHIMS Competency Areas

Administrative

- Leadership

1. **Participate** in organizational strategic planning (e.g. measure performance against organizational goals)
2. **Assess** the organizational environment (e.g., corporate culture, values, and drivers)
3. **Forecast** technical and information needs of an organization by linking resources to business needs
4. **Develop** an IT strategic plan and departmental objectives that align and support organizational strategies and goals
5. **Evaluate** performance (e.g., goal/performance indicators, systems effectiveness)
6. **Evaluate** effectiveness and user satisfaction of systems and services being provided
7. **Promote** stakeholder understanding of information technology opportunities and constraints (e.g., business and IT resources, budget, project prioritization)
8. **Develop** policies and procedures for information and systems management
9. **Comply** with legal and regulatory standards
10. **Adhere** to ethical business principles
11. **Employ** comparative analysis strategies (e.g., indicators, benchmarks)

HIMSS

CPHIMS Competency Areas

Administrative

- Leadership

12. **Prepare** and deliver business communications (e.g., presentations, reports, project plans)
13. **Facilitate** group discussions and meetings (e.g., consensus building, conflict resolution)
14. **Provide** consultative services to the organization on IT matters
15. **Develop** educational strategies regarding the information and management systems function
16. **Maintain** organizational competencies on current IT technologies and trends
17. **Assure** that risk management is embedded in internal and external management processes, and consistently applied (e.g., risk assessment, risk mitigation)
18. **Ensure** quality standards and practices are followed by monitoring internal and external performance

CPHIMS Competency Areas

Administrative

- Management

1. **Define** roles, responsibilities, and job descriptions for IT-related functions
2. **Assure** staff competency in information and management systems skills
3. **Manage** projects and portfolios of projects (e.g., initiate, plan, execute, control, close)
4. **Manage** relationships with vendors (e.g., contract cost, schedule, support, maintenance, performance)
5. **Facilitate** steering committee meetings and/or topics
6. **Assure** adherence to industry best practices (e.g., change control, project management)
7. **Maintain** system, operational, and department documentation
8. **Provide** customer service (e.g., service level management, request tracking, problem resolution)
9. **Manage** budget and financial risks
10. **Manage** customer relationships with business unit leaders

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	3	3%	22	22%	15	15%	40	40%
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

Health IT Characteristics

- Fast-paced
- Dynamic
- Ever-changing
- Focused on achieving the meaningful use of health IT and other on Regulatory Initiatives to Improve Patient Care
- Virtual education is critical

HIMSS

CPHIMS

Module 1
The Healthcare Environment

HIMSS

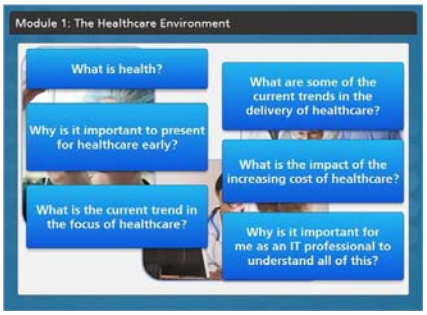
Learning Objectives

- Articulate the characteristics and services of different types of healthcare organizations
- Identify the characteristics of interrelationships within and across healthcare organizations
- Differentiate the roles and responsibilities of healthcare information and management systems professionals
- Describe the roles of governmental, regulatory, professional, and accreditation agencies in the healthcare environment

HIMSS

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	3	3%	22	22%	15	15%	40	40%
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%



What is Health?

- The World Health Organization (WHO) defines *health* as:

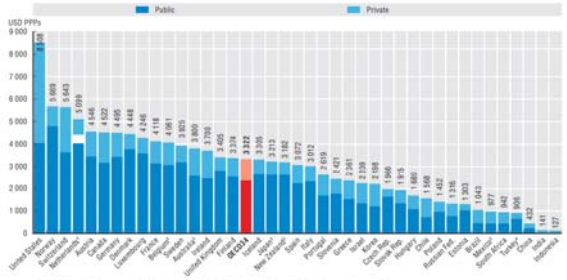
  "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

Key Issues in Healthcare

- High, rapidly rising costs
- Highly variable clinical quality
- Patient safety issues
- Need for evidence-based decision making
- Complex administrative processes
- Increasing consumerism and heightened expectations
- Research and technology advances

HIMSS
transforming health through IT

Health expenditure per capita, 2011 (or nearest year)



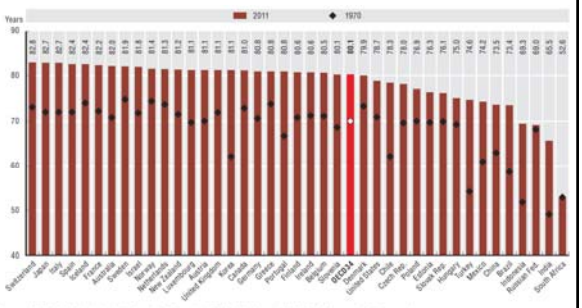
1. In the Netherlands, it is not possible to clearly distinguish the public and private share related to investments.
2. Current health expenditure.
3. Data refers to 2010.
4. Data refers to 2008.

Source: OECD Health Statistics 2013, http://dx.doi.org/10.1787/health-data-en; WHO Global Health Expenditure Database.

StatLink http://dx.doi.org/10.1787/888932918833

HIMSS
transforming health through IT

Life expectancy at birth, 1970 and 2011 (or nearest year)

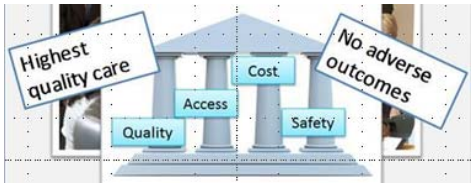


Source: OECD Health Statistics 2013, http://dx.doi.org/10.1787/health-data-en; World Bank for non-OECD countries.

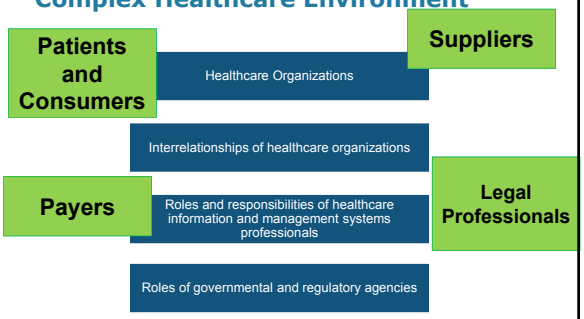
StatLink http://dx.doi.org/10.1787/888932916002

HIMSS
transforming health through IT

Complex Healthcare Environment



Complex Healthcare Environment

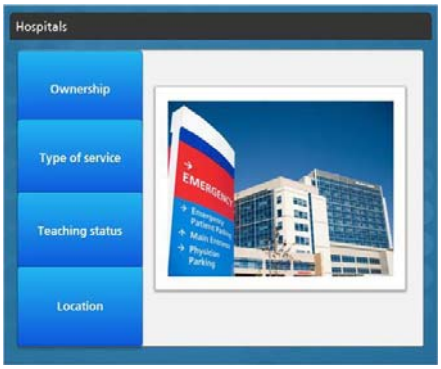


Providers of Care

- Hospitals
- Ambulatory Care Centers
- Physician Practices / Clinics
- Long-term Care Providers
- Public Health Agencies
- Community Health Organizations
- Diagnostic and Pharmaceutical Services
- Others?

Healthcare Organizations - Hospitals

HIMSS



HIMSS

Healthcare Organizations - Hospitals

Hospitals (inpatient care facilities) may be classified by:

- Ownership
  - Public (government-owned & managed)
  - Private
- Private hospitals may be further classified by
  - Non-profit
  - For-profit (Investor-owned)

HIMSS

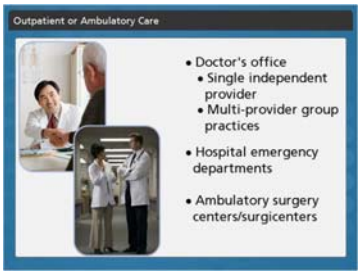
Healthcare Organizations - Hospitals

- By type of services provided
  - General hospitals
  - Psychiatric hospitals
  - Rehabilitation hospitals
  - Children's hospitals
- By teaching status
  - Academic medical centers or university hospitals
- By geographic location
  - Rural hospitals/Critical Access
  - Urban hospitals
- Others?

Long-term Care Providers

- Nursing Home – skilled nursing and intermediate care facilities
- Rehabilitation
- Mental Health
- Home Healthcare Agencies
- Long Term Acute Care

Healthcare Organizations - Outpatient or Ambulatory Care



Healthcare Organizations

Other healthcare delivery organizations include:

- Hospital-owned Clinics
- Community health organizations
- Public Health Agencies and Programs
- Diagnostic and pharmaceutical services
  - Laboratory services
  - Radiological services
  - Pharmacies
- Retail-based Care (Walmart and CVS)

Integrated Delivery Network (IDN)

- A healthcare organization with a variety of providers offering services across the continuum of care and integrated in administration and information sharing.
- Formed through:
  - Merger and acquisition
  - Joint venture
  - Alliance
  - Network

Healthcare Organizations: Payers

Beyond healthcare delivery organizations, many other types of organizations are part of the healthcare process, including payers which may be classified as:

- Publically financed
- Privately financed

Payers: Publically Financed

- Government-financed and managed programs
  - National Health Service (United Kingdom)
  - National Health Insurance (Canada)
  - Multi-payer system (United States)

Payers: Privately Financed

- Insurance programs administered by private entities, generally funded by
  - Employers
  - Patients themselves
  - Government (Medicare Advantage Plans)
  - Some combination of both

Organizational Interrelationships

Support such purposes as:

- Enabling access to comprehensive care services
- Assuring effective transfers of care
- Ensuring the general portability of care
- Ensuring appropriateness of service

Organizational Interrelationships

- Reporting public and population health information
- Obtaining appropriate reimbursement for care
- Supporting particular models of care

Public and Population Health

- UK: Secondary Use Services (SUS)
- US:
  - Centers for Disease Control and Prevention
  - Centers for Medicare and Medicaid Services
  - State and City Departments of Health
  - Immunization Registries

Healthcare Workforce

- Physicians / Providers
  - Primary Care
  - Specialists
  - Hospitalists
  - Physician Assistants
  - Residents and Interns

Healthcare Workforce

- Other Roles:
  - Nursing
  - Pharmacists
  - Therapists
  - Technicians
  - Clinical Departmental Support (Infection Control, UR, Social Services, etc.)
  - Clinical Support Staff (Unit Coordinators)
  - Clerical
  - Materials/Inventory
  - Administrative
  - IT / HIT

Roles and Responsibilities of Health IT Professionals

- Senior IT roles
  - Chief Information Officer: CIO
  - Chief Technology Officer: CTO
  - Chief Security Officer: CSO
  - Privacy Officer
- Senior Clinical Information Management Roles
  - Chief Medical Information Officer: CMIO
  - Chief Nursing Informatics Officer: CNIO

Common IT Positions in Larger Healthcare Organizations

- Desktop Support Specialist
- Database Administrator
- Network Engineer/Analyst
- Project Manager
- Programmer/ Application Developer
- Systems Analyst
- Security Analyst
- Web Developer
- Telecommunications Specialist

IT Department Responsibilities

- Operations and technical support
- Application management
- Information security
- Network / Data Center operations
- Database administration
- Website development
- Telecommunications

The Roles of Government, Regulatory, Professional and Accreditation Agencies

The Roles of Government

- Provider of Care
  - Public ownership of hospitals and clinics
    - US: Department of Veteran Affairs
    - UK: National Health Service
- Payor
  - National Health Insurance
    - US: Centers for Medicare and Medicaid Services
    - Canada: Provincially-funded health insurance
- Regulator
  - Laws
  - Regulations

The Roles of Governmental and Regulatory Agencies in Healthcare

- Government
  - Annual growth in healthcare expenses of OECD* countries has averaged 4%, while annual GDP growth has only averaged 1.6%
  - Governments must balance the cost of care with the quality, access, and safety of that care
- Regulatory agencies
  - Implement the provisions of a nation's health laws through a more explicit system of regulations

* OECD - The Organisation for Economic Co-operation and Development (OECD)

Examples of Regulatory Law

- Licensure
- HIPAA and EMTALA
- UK Data Protection Act of 1998
- European Union Data Protection Directive (EUDPD)

The Role of Professional Associations in Healthcare

- Generally determine entrance requirements to professions by determining examination requirements
- Exist for most professions
- UK - Total Professions:
  - Set and assess professional examinations
  - Publish professional journals
  - Provide expertise networking and learning opportunities
  - Handle complaints and disciplinary procedures
  - Establish code of conduct

Often Responsible for developing and publishing standards for Evidence Based Medicine

The Role of Accreditation Agencies in Healthcare

- Typically serve in a semi-regulatory role on behalf of the government
  - Joint Commission International (JCI)
  - US: CMS Approved AO's
    - The Joint Commission for Accreditation of Healthcare Organizations (Joint Commission)
    - The Accreditation Association for Ambulatory Health Care (AAAHC)
    - Accreditation Commission for Health Care (ACHC)

HIMSS

Summary

- Characteristics and services of healthcare organizations
- Interrelationship of healthcare organizations
- Roles and responsibilities of healthcare information and management systems professionals
- Roles and responsibilities of governmental and regulatory agencies

HIMSS

CPHIMS

Module 2
The Technology Environment

HIMSS

Learning Objectives

- Articulate characteristics of applications commonly used in healthcare (e.g., clinical, administrative, financial, consumer, business intelligence)
- Identify the characteristics of technology infrastructure that support the healthcare environment (e.g., network, communications, data integration, privacy and security)

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	3	3%	22	22%	15	15%	40	40%
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

Components of the Technology Environment

- Technology Infrastructure
  1. Hardware – the actual servers (virtual and physical), network connections, and devices used to access information
  2. Networks – the wired or wireless connections that link the infrastructure together and enable accessibility of the applications and patient data
  3. Applications/software – the software used by administrative, clinical and support staff to process and store data, manage patients' records and provide information

End-User Devices

- Personal Computers
  - Continue to be the device of choice
  - Connected via cable to network or wireless
- Point-of-Care Devices
  - Handheld, tablet, mobile-cart PCs, smart phones
  - Support clinician workflow
  - Wireless connection
- Device Integration
  - Integrated into software applications
  - Cable or wireless connection to common network

End-User Devices (continued)

- Tracking technology
  - Bar codes and RFID
- Audio and video
  - Voice over IP
  - Telemedicine
  - Remote monitoring

Hardware

- Servers
  - Application
  - Network
  - Database
- Data Storage
  - External device – Storage Area Network (SANs)
- Models
  - Single Server or Distributed
  - Blade technology
  - Virtualization

Requirements:

- **Redundancy**
- **Architecture to support 24X7**
- **Disaster Recovery**
  - **Hot Site: minutes to hours**
  - **Warm Site**
  - **Cold site: hours to days**

Delivery Models

- Alternatives to an In-house Delivery Model
  - Application Service Provider (ASP) or Remote Computing Option
    - Houses and manages back-end application and database remotely
  - Cloud-based
    - Uses a service model – monthly fees
- Advantages
    - Usually provides strategy for back-up and recovery
    - Provides "currency" in terms of upgrades
    - Reduces IT resource requirement
    - May run at lower Total Cost of Ownership
    - May provide more robust security
    - May reduce overall requirements and cost for local data center (space, electricity, security, etc.)

Connectivity

- LAN (Local Area Network)
- WLAN (Wireless Local Area Network)
- WAN (Wide area network)
- ISP (Internet Service Provider)
- VPN (Virtual Private Network)
- Leased Line for high volume exchanges

Applications and Suites

- Revenue Cycle
- Clinical Point of Care
- ERP
- Ancillary and Departmental
- Shared
  - Document Imaging
  - EMPI
  - Analytic Platform

Environments:

- **Production**
- **Test**
- **Train**

Revenue Cycle

- EMPI, Scheduling, Admissions, Eligibility
- Charge Management
- Billing
- Denial Management
- AR Management
- Contract Management

Getting to Zero Balance

Examples of Metrics:

- Days in AR
- % Bad Debt
- % of Claim Rejections
- Rate of Denials
- % of accounts with late charges
- Variance from Expected reimbursement
- Cost to collect
- % of accounts with Insurance Verification

Clinical – Point of Care

- EMR/EHR
- Demographic and Clinical Data
- Clinical documentation
  - Nursing and physician documentation
  - Assessments, care plans, vital sign flowsheets
  - Medication reconciliation and Medication Administration (MAR)
- Clinical Decision Support capabilities
- CPOE (Computerized Provider Order Entry) and E-Prescribing (Assumes Pharmacy)
- Outcomes generation

Examples of Metrics:

% CPOE Orders
% Patients with Problem List
% Patients with verified allergies
% Patients with discharge inst.
% Readmissions
% Physicians using EMR

Terminology

- EHR
  - longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting.
- EMR
  - Health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one healthcare organization
- PHR
  - Consumer oriented and controlled
  - Increasingly tied to chronic disease management programs

Terminology

- Legal Medical Record
  - Content mandated by states
  - Must be in a format that supports disclosure of information
  - Often documents stored in a document imaging system that can support business functions of disclosure.
- CPR (Computerized Medical Record)
  - Older term for record consisting of scanned documents

ERP (Enterprise Resource Planning)

- General Ledger (Balance Sheet and Income Statement)
- Budgeting
- Accounts Payable
- Materials Management
  - Supply Chain Management
    - Inventory
    - Procurement
  - EDI Capabilities
- HR/Payroll
  - Time and Attendance

Examples of Metrics:

- EBITDAR
- Operating Margin
- Days Cash on Hand
- FTEs Per Patient Day
- Inventory Turnover
- Personnel expense as a percent of operating revenue

Ancillary and Departmental

- Laboratory, Radiology, Pharmacy
  - Supports ordering, processing, charging, inventory management, reporting
- Medical Records
  - Responsible for integrity and validity of patient data
  - Responsible for managing a legal medical record
  - Functions: record analysis, completion, deficiency tracking, coding, managing requests for patient charts
- Social Services, Utilization Review, Discharge Planning, Quality Management, Dietary, Housekeeping

Consumers and Health IT

- Debate in 'ownership' of EMR
  - Systems owned by providers
  - Information owned by patients
  - Most are agreeing that patients do have the right to access or get copies of their medical records (US HIPAA Mandate)
- Most would like a patient portal provided by their hospital or provider.
- PHRs are often independent of providers and controlled by patients

HIMSS

Consumers and Health IT

Patients want:

- Email accessibility with their providers and staff
- Ability to use their personal health record (PHR)
  - Control access
  - Maintain records
  - Import data from pharmacy and labs
- Self-scheduling
- Access to trusted healthcare resources and information

HIMSS

Business Intelligence

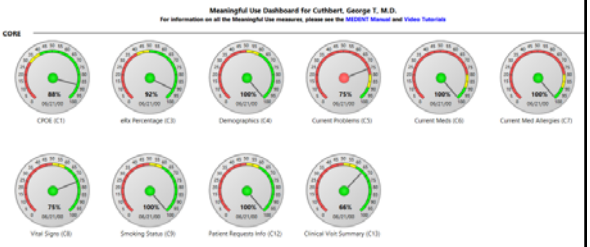
- Broad category of technologies that address storing, analyzing, and providing access to data that helps users to gain insights and make better fact-based business decisions
  - Continuous quality improvement
  - Provider performance
  - Population health
  - Comparative effectiveness.

Examples:

- Comparing the actual mortality rates for patients treated by different surgeons
- Ranking those surgeons by their relative mortality rates
- Assigning each physician to a performance quintile based on their mortality rates

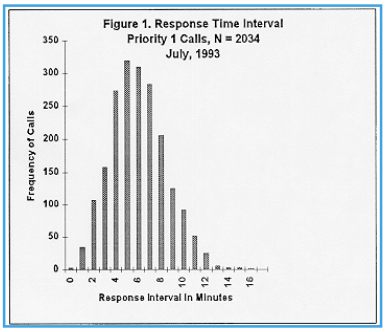
HIMSS

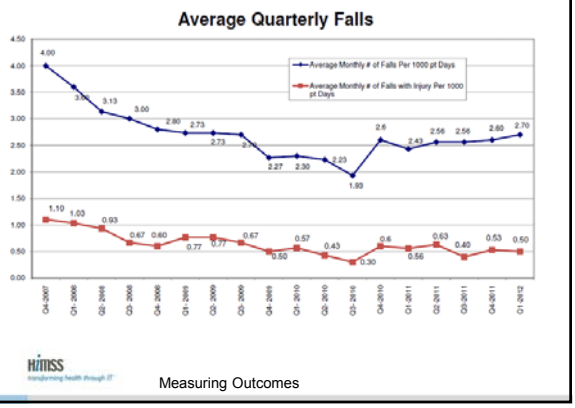
Clinical Process Outcomes Dashboard



76

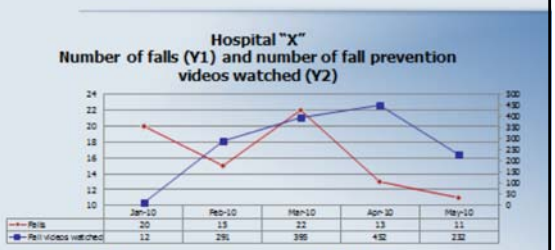
Histogram – Distribution of Response Intervals





Measuring Outcomes

Reduction in Preventable Falls



- Video Viewings increased 2200%
- Falls Reduced 45%

Enhancing the Patient Care Continuum

Telehealth

One of the fastest growing parts of healthcare:

- Provides care in underserved areas
- Less travel required (no driving to appointments)
- Appointments can be set up more quickly
- Patient outcomes are often better with telehealth support

HIMSS

Interoperability

- Interoperability – The ability of systems/hardware to communicate
- Interoperability supports
  - Presenting patient data at the point of care
  - Seamless presentation to clinical staff, from multiple systems
- Standards to ensure data exchange, supporting interoperability
  - HL7
  - SNOMED
  - DICOM
  - ICD
  - Procedure codes

HIMSS

Interoperability

Health Information Exchange

Global work in progress

- Need unique identifier
- Accurate linking of particular patient's record, wherever the patient is
- EuroNeoStat II in place in Europe

Trends in Healthcare Applications

- Application Integration - The ability for applications to share information and work more or less seamlessly to deliver the desired functionality to the end-user
  - Tools and Approaches (Examples)
    - Enterprise master person index
    - Interface engine
    - Product suite (Best of Cluster)
    - Single sign-on
    - CCOW
  - Adoption of standards essential to integration and interoperability

Trends in Healthcare Applications

- Vendor Application Delivery
  - Healthcare IT increasingly a "buy" (COTS*) as opposed to "build"
  - Certification requirements
  - Products highly configurable
  - Movement to "cloud"
  - Preference for single-vendor solutions
- Focus on health data exchange and interoperability

*commercial off-the-shelf

HIMSS

Trends in Healthcare Applications

- Consumer applications
- Security and Privacy Increasingly Important
  - –Increased stored and shared data
- Government standards
  - – US: HIPAA
- European Union – Directive on Data Protection
- Mobile
- Telemedicine
- Big Data

HIMSS

HIMSS

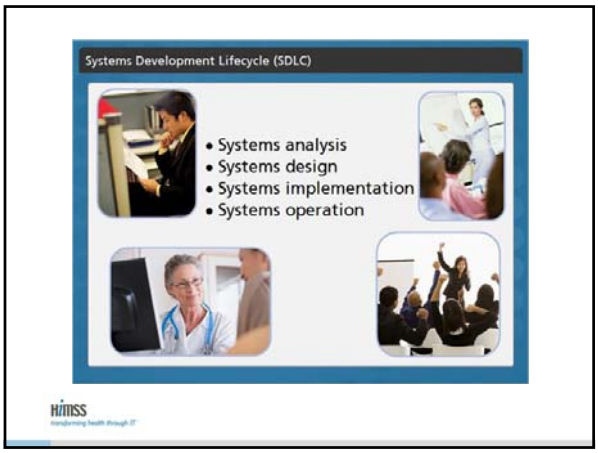
Module 3
Systems Analysis

Learning Objectives

- Describe the purpose of systems analysis
- List the major components of systems analysis
- Articulate the problems that can be resolved through proper policies based on IT
- Explain the current and developing trends in IT systems analysis
- Describe how to perform a cost-benefit analysis of a proposed initiative
- Identify the project management stages which are most important to the systems analysis phase

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	3	3%	22	22%	15	15%	40	40%
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%


Systems Development Lifecycle (SDLC)
• Systems analysis
• Systems design
• Systems implementation
• Systems operation

Why Is Systems Analysis Important?
First Step in SDLC
•Problem Definition
•Needs Assessment
•Cost Benefit Analysis
•Determine the "why"
Establishes scope and value
Lays foundation

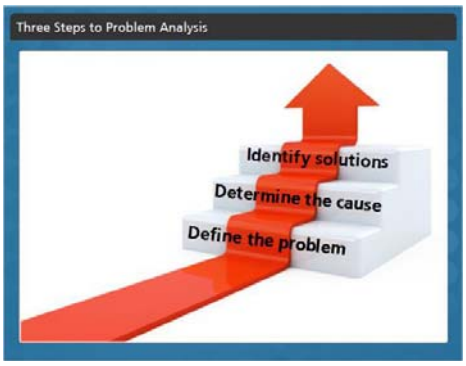
Why Is Systems Analysis Important?
•Determines " what" the system is to do
Establishes scope and value
Lays foundation

Investment in Systems Analysis Warranted

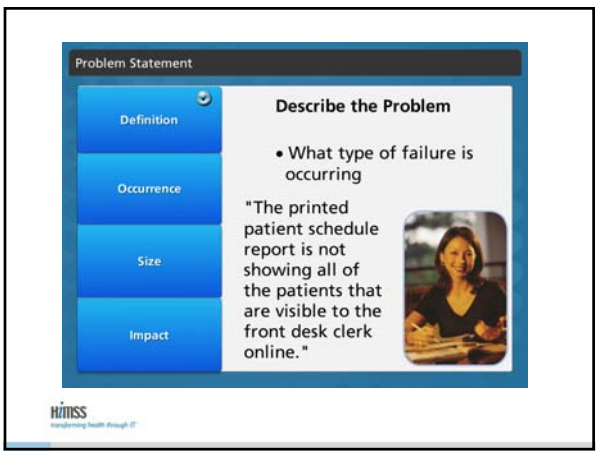
- Ensures systems deliveries
- Cost of changing and/or adding requirements later in SDLC increase substantially

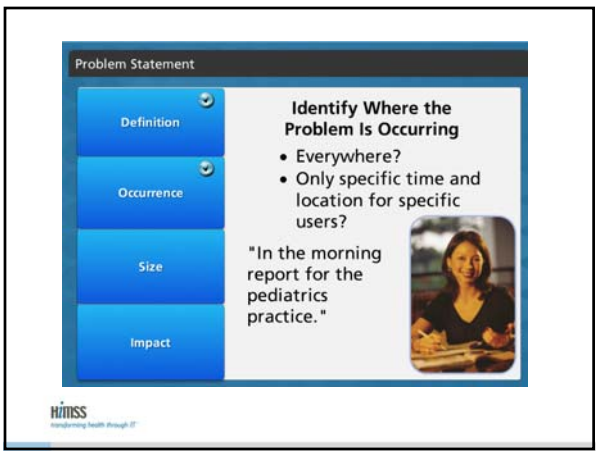
Overview of the Systems Analysis Process in Healthcare

Problem Analysis	Preliminary Investigation	Requirements Analysis
Analysis of Alternatives	Proposal/Approval	Project Management



Problem Statement
Definition
Occurrence
Size
Impact
Step 1: Define the Problem
Six Sigma


Problem Statement
Definition
Occurrence
Size
Impact
Describe the Problem
• What type of failure is occurring
"The printed patient schedule report is not showing all of the patients that are visible to the front desk clerk online."


Problem Statement
Definition
Occurrence
Size
Impact
Identify Where the Problem Is Occurring
• Everywhere?
• Only specific time and location for specific users?
"In the morning report for the pediatrics practice."

Problem Statement

Definition

Occurrence

Size

Impact

Describe the Size of the Problem

- Measurable terms

"Over the past 3 days, an average of 3 out of 82 patients per day were missing from the report."

HIMSS

Problem Statement

Definition

Occurrence

Size

Impact

Describe the Impact of the Problem

- To help determine priority

Backup = low priority

Reconciliation = high priority

HIMSS

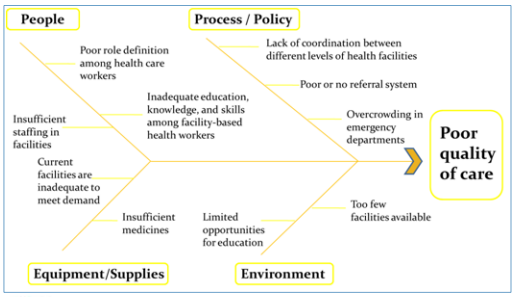
Step 2: Determine the Cause

- Use investigative tools
- Look at all factors: people, process, technology
- Distinguish between symptomatic cause and root cause

Interviews
Questionnaire
Brainstorming
Delphi Approach

HIMSS

Using A Fishbone Diagram



HIMSS

Step 3: Identify Solutions

1. What is the priority for resolving the problem?
2. Is the goal to solve the symptom or root cause of the problem?
3. Will the approach to solving the problem rely on people, process or technology or some combination of the three?
4. What is the broader impact of the solution, and are there any unintended consequences?
5. Does the problem reveal a wider opportunity for improvement?

HIMSS

Problem Analysis versus Needs Assessment

Problem Analysis

- Reaction to a breakdown in process or technology
- Focus on short-term or immediate fix
- Targets specific issue that needs to be resolved

Needs Assessment

- Study of needs of department, process or organization as a whole to determine what technology solution should be considered to deliver benefit and value
- More proactive; longer term view of technology investment
- Consideration of broader situation and how solution will integrate with other existing planned components

HIMSS

Goal of Needs Assessment

- Recommendation on the scope and anticipated benefits

HIMSS

Needs Assessment Team

Objectivity

Independence

- Sponsor
- Analysts
- Subject-matter experts

Subject-matter expertise

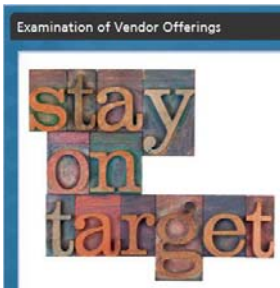
HIMSS

Needs Analysis Tools

- Interviews
- Review of documentation
- Observation
- Surveys
- Data analysis

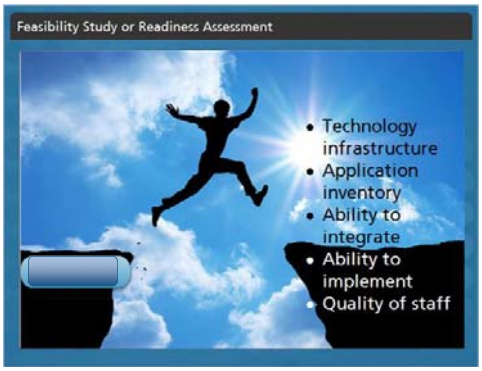
HIMSS

Examination of Vendor Offerings



- One of the last steps
- High level
- Identification of opportunities not surfaced earlier

Feasibility Study or Readiness Assessment



- Technology infrastructure
- Application inventory
- Ability to integrate
- Ability to implement
- Quality of staff

Go/No Go

Move forward | Move forward on some needs | Do not move forward

Steps in Requirements Analysis

- Current state analysis
- Future state analysis
- Prioritization
- Stakeholder sign-off

HIMSS

Current State Analysis

- "As is" analysis
- How current processes and information solutions work
- Business processes the solution must support
- How those processes are currently supported
- Current deficiencies

HIMSS

Interdisciplinary Requirements Workshop

- Facilitator guides description of process, strengths and weaknesses
- Process documented to validate input
- Yields unbiased, accurate and consensus description of current state

HIMSS

Modeling Current State

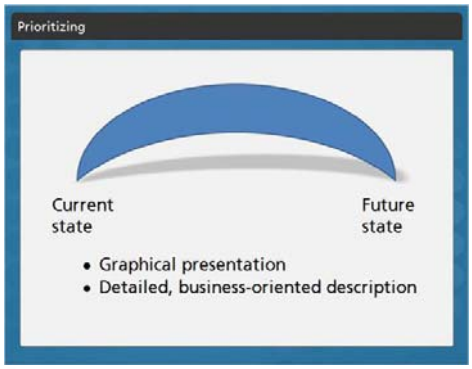
- Model how it works
  - Activity Diagram
  - Dataflow Diagram
  - Flowchart

Identification of Deficiencies

- Deficiencies to be addressed by future state
  - By participants
  - From the analysis
  - Through examination of performance metrics

Future State Analysis

- "To be" analysis
- The "what" of the solution
- "How" — responsibility of system design



Requirements Analysis

Describing, Validating, Prioritizing

- Requirements document
  - High level description/use cases
  - Detailed description of each requirement
  - Graphical depiction
- Prioritize
  - Needs – must-haves, which are critical to benefits realization
  - Wants – desirable
  - Use scoring methodology and/or force ranking

Categorization of Requirements

- Functional
- Reporting/analysis capabilities
- Regulatory requirements
- Data/database
- Security
- System performance and response time
- Disaster recovery
- Platform compatibility
- Interfaces and Interoperability
- Physical plant considerations
- Client devices
- Network

Examples

Requirements Analysis

Describing, Validating, Prioritizing

- Validate and/or prototype
- Sign-off by all stakeholders:
  - Establishes basis of commitment
  - Creates baseline for scope/requirements change requests

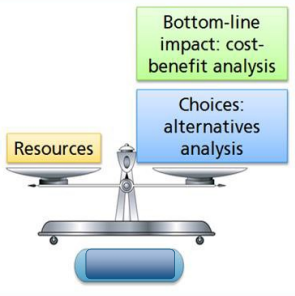
HIMSS

Stakeholder Sign-Off

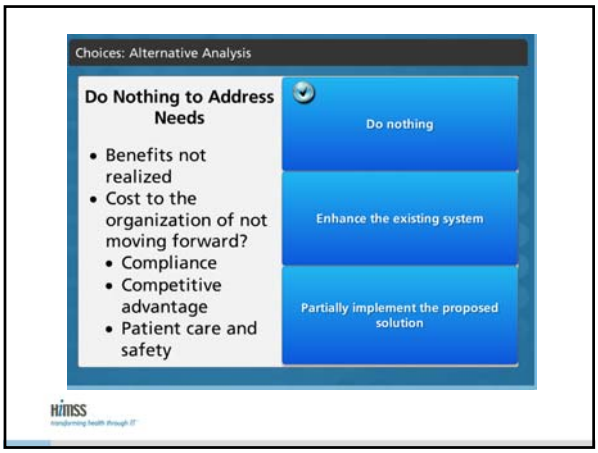
- Commitment to understanding and accepting requirements
- After walk-through of requirements and process changes
- Reduction of chances of confusion
- Baseline for change requests

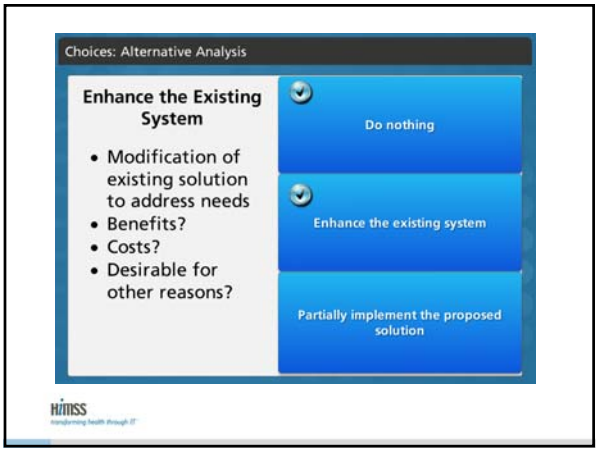
HIMSS

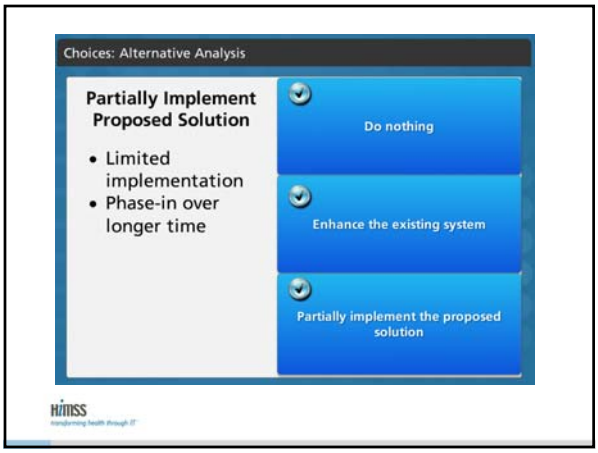
Analysis of Alternatives



HIMSS


Choices: Alternative Analysis
Do Nothing to Address Needs
• Benefits not realized
• Cost to the organization of not moving forward?
• Compliance
• Competitive advantage
• Patient care and safety
Do nothing
Enhance the existing system
Partially implement the proposed solution


Choices: Alternative Analysis
Enhance the Existing System
• Modification of existing solution to address needs
• Benefits?
• Costs?
• Desirable for other reasons?
Do nothing
Enhance the existing system
Partially implement the proposed solution


Choices: Alternative Analysis
Partially Implement Proposed Solution
• Limited implementation
• Phase-in over longer time
Do nothing
Enhance the existing system
Partially implement the proposed solution

Cost Benefit Analysis (CBA)

- Validation that benefits equal to or greater than costs
- Common yardstick for comparison of alternatives
- Basis for holding stakeholders accountable for realizing benefits

HIMSS

Conducting a Cost Benefit Analysis

- Variables to be considered in the analysis include:
  - Time of implementation
  - Cost of implementation
  - Alternatives to the current proposal
  - Impact of Internal/External Stakeholders
  - Sustainability versus running costs per year
  - Value of time to be used in implementation

HIMSS

Joint Effort

- Project team
- Stakeholders
- Finance or Accounting

Why?

- Complicated calculations
- Credibility
- Consistency

HIMSS

emr_roi.jpg 785×...

Cost-Benefit Analysis Example (Single Provider Office)	Initial Costs	Year 1	Year 2	Year 3	Year 4	Year 5	5 Year Total
Costs (Per Provider)							
Software License	$10,000						
Implementation – Software Customization ($100/hr x 10 hrs)	$1,000						
Implementation – Training ($100/hr x 25 hrs)	$2,500						
Implementation – Travel Expenses	$1,500						
Implementation – Computer & Network Setup	$1,000				$1,000		
Hardware – 1 x Tablet PC	$2,500				$2,000		
Hardware – 3 x Workstations	$3,000				$2,500		
Hardware – Network Server	$2,000				$1,000		
Support & Maintenance – Software		$2,000	$2,000	$2,000	$2,000	$2,000	
Support & Maintenance – Computer		$1,000	$1,000	$1,000	$1,000	$1,000	
Induced Costs – Productivity Loss (40 hrs)	$10,000						
Gross Annual Costs	**$33,500**	**$3,000**	**$3,000**	**$3,000**	**$9,500**	**$3,000**	**$55,000**
Additional Physician Adjustment (10%-30%)							
Net Annual Costs							
Benefits (Per Provider)							
Improved Coding		$12,500	$23,000	$23,000	$23,000	$23,000	
Transcription Savings		$3,000	$6,000	$6,000	$6,000	$6,000	
Chart Management		$2,400	$4,800	$4,800	$4,800	$4,800	
Searching for Charts		$1,000	$2,000	$2,000	$2,000	$2,000	
Prescription Refills		$3,250	$6,500	$6,500	$6,500	$6,500	
Capitated Benefits (If applicable)			$29,000	$29,000	$29,000	$29,000	
Total Annual Benefits		**22,150**	**$44,300**	**$44,300**	**$44,300**	**$44,300**	**$199,350**
Net Benefit (cost)	**$(33,500)**	**$19,150**	**$41,300**	**$41,300**	**$34,800**	**$41,300**	**$144,350**

emr_roi.jpg 785×...

Cost-Benefit Analysis Example (Single Provider Office)	Initial Costs	Year 1	Year 2	Year 3	Year 4	Year 5	5 Year Total
Costs (Per Provider)							
Software License	$10,000						
Implementation – Software Customization ($100/hr x 10 hrs)	$1,000						
Additional Physician Adjustment (10%-30%)							
Net Annual Costs							
Benefits (Per Provider)							
Improved Coding		$12,500	$23,000	$23,000	$23,000	$23,000	
Transcription Savings		$3,000	$6,000	$6,000	$6,000	$6,000	
Chart Management		$2,400	$4,800	$4,800	$4,800	$4,800	
Searching for Charts		$1,000	$2,000	$2,000	$2,000	$2,000	
Prescription Refills		$3,250	$6,500	$6,500	$6,500	$6,500	
Capitated Benefits (If applicable)			$29,000	$29,000	$29,000	$29,000	
Total Annual Benefits		**22,150**	**$44,300**	**$44,300**	**$44,300**	**$44,300**	**$199,350**
Net Benefit (cost)	**$(33,500)**	**$19,150**	**$41,300**	**$41,300**	**$34,800**	**$41,300**	**$144,350**

Time to Payback
Return on Investment in Today's Dollars
Return on Investment Expressed as Percent

Review with Stakeholders

- Include all stakeholders
- Goal
  - Broad support from most stakeholders
  - No strong resistance

HIMSS

Communication

- Gear communication to the audience
- Comprehensive view for managers, subject-matter experts, project staff, vendors
- Executives, department heads, other leaders:
  - Executive summary
  - Presentation
  - Proposal if appropriate

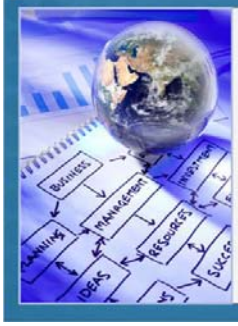
HIMSS

Project Management

- Works hand-in-hand with systems analysis
- Applies accepted practices, tools and techniques
- Balances constraints of scope, time and cost

HIMSS

Project Management Body of Knowledge® (PMBOK®)



- Established by Project Management Institute (PMI)
- Certified by American National Standards Institute (ANSI/PMI 99-001-2004)
- PMI and HIMSS offer programs in project management

HIMSS

Five Stages

1. Initiating
2. Planning
3. Executing
4. Monitoring /controlling
5. Closing

HIMSS

Managing Projects and Resources

- Project Management Triangle
- Critical to the success of an investment is the ability to implement the solution following the principles of project management
- The importance of celebrating successes

HIMSS

Summary

- Systems Analysis
  - Supports development of new initiatives, including investigation, requirements and proposal
  - Supports change process
  - Honors the role of project sponsor and stakeholders as having ultimate responsibility
  - Recognizes importance of workflow and process change
  - Focuses on end product

HIMSS

Summary

- Describe the purpose and list the major components of systems analysis
- Articulate the differences between problem analysis and needs assessment and their roles in systems analysis
- Explain how the "current" and "future state analysis" are used
- Describe the value of using a cost-benefit analysis and analysis of alternatives
- List the project management stages most important to systems analysis

HIMSS

CPHIMS

Module 4
Systems Design

HIMSS

Learning Objectives

- Identify the key elements of creating a business case
- Define and describe the differences between the request for information (RFI) and request for proposal (RFP)
- Discuss what factors to consider in making a buy-versus-build decision
- Identify the processes, techniques and deliverables when a system is developed in-house
- Describe what factors to consider in making a best-of-breed versus tightly integrated system purchasing decision

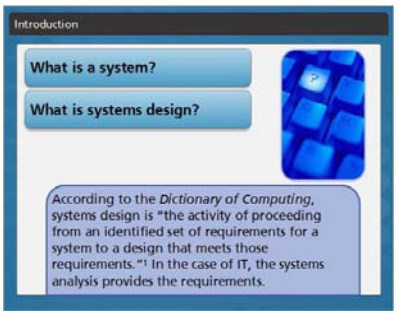
HIMSS

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	**3**	**3%**	**22**	**22%**	**15**	**15%**	**40**	**40%**
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	**0**	**0%**	**3**	**3%**	**3**	**3%**	**6**	**6%**
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

HIMSS

Definition of System and Systems Design



HIMSS

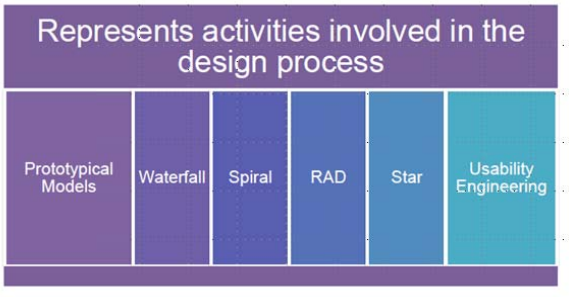
Systems Design

- Purpose and Goals of Systems Design:
  - Deliver accurate technical specifications and/or prototype or working software for iterative validation
  - Ensures traceability to requirements and test procedures
  - Validation promotes user acceptance
  - Deliverables and timing determined by methodology utilized (Waterfall vs. Agile)

Why All The Fuss About Design

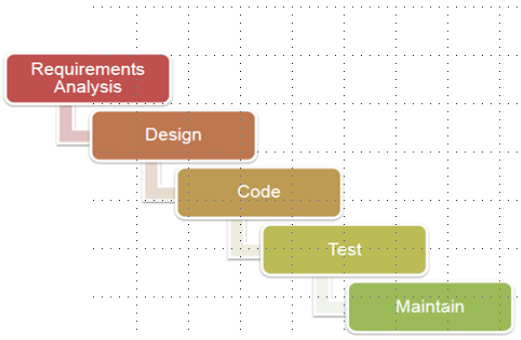
- Documented usability problems in healthcare and their consequences
- Clinical information systems present problems in implementation & beyond
- Many systems do not adequately address customer specifications
- Fixing a problem in development phase costs 10 times more than in design phase

Lifecycle Models



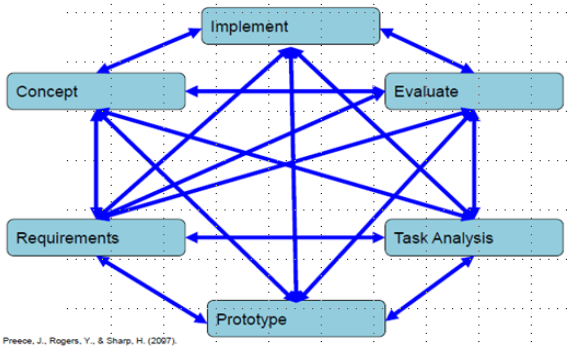
Courtesy of Columbia University and the ONC Health IT Workforce Curriculum program 15

Waterfall Lifecycle Model



Courtesy of Columbia University and the ONC Health IT Workforce Curriculum program

Star Lifecycle Model



Preece, J., Rogers, Y., & Sharp, H. (2007).

Courtesy of Columbia University and the ONC Health IT Workforce Curriculum program

Systems Design Tools

- Flowcharts and diagrams
  - Data flowcharts
  - Unified Modeling Language (UML)
  - Entity-relationship
  - Network topology
  - Data exchange (interoperability diagrams)
- Prototypes or working software (agile)

Design For Business Process Management

Business Process Management

- Unique
- Understand an organization's process
- Apply understanding to design of a system

HIMSS

Business Objectives

- Measurable and quantifiable
- Time frame
- Attainable

Example of a business objective:
Improve admission time from two hours to one hour within the next year to improve patient satisfaction.

HIMSS

Business Case

- Executive summary
- Situation analysis and problem statement
- Project description
- Solution overview
- Solution detail
- Solution alternatives
- Costs
- Benefits
- Implementation timeline
- Critical assumptions and risk assessment
- SWOT (strengths, weaknesses, opportunities, threats) analysis
- Conclusions and recommendations

HIMSS

Structure of the System Design Team

- Project sponsor
- Project manager/leader
- Business analyst(s)
- Data/process modeler
- Technical lead/architect
- Biomedical engineers
- Application developers
- Quality assurance analysts
- Information security officer
- Stakeholders/users
- Legal counsel
- Procurement expert

HIMSS
transforming health through IT

Information Infrastructure

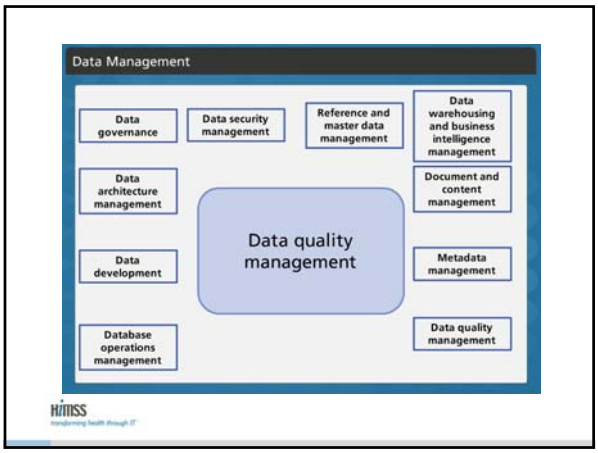
- Support today's business requirements
- Anticipate emerging or future business requirements
- Evaluate new and changing technologies

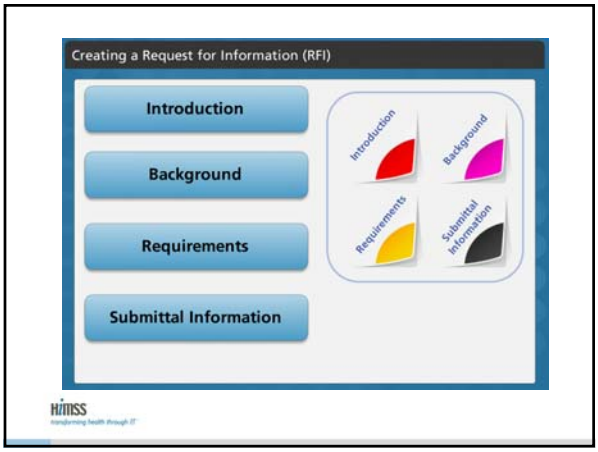
HIMSS
transforming health through IT

Business Continuity

- Natural or man-made disasters
- Off-site storage
- Disaster recovery
- Multiple data centers mirror data
- Regular testing

HIMSS
transforming health through IT


Data Management
Data governance
Data security management
Reference and master data management
Data warehousing and business intelligence management
Data architecture management
Document and content management
Data quality management
Data development
Metadata management
Database operations management
Data quality management


Creating a Request for Information (RFI)
Introduction
Background
Requirements
Submittal Information
Introduction
Background
Requirements
Submittal Information

Buy Decision
• Best-of-breed vs. tightly integrated solutions
• Preferences shift back and forth
• Today, single vendor solutions due to patient safety focus
• Final decision from RFP process

Creating a Request for Proposal (RFP)

- Technical requirements are most important.
- Unclear requirements may result in:
  - High bids to mitigate risk
  - Lower response rate
  - Incorrect assumptions
  - Project delays
  - Litigation

HIMSS

Summary

- Design team
- Clear, documented technical specifications
- RFI
- Buy or build decision

HIMSS

CPHIMS

Module 5 System Selection, Implementation, Support and Maintenance

HIMSS

Learning Objectives

- Discuss the solution selection criteria
- Identify the solution selection activities
- Describe the implementation process
- Define the methods to manage the healthcare information system

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	**3**	**3%**	**22**	**22%**	**15**	**15%**	**40**	**40%**
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	**0**	**0%**	**4**	**4%**	**3**	**3%**	**7**	**7%**
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

Successful implementation = Organized system selection process + Well planned and executed implementation strategy

• Selection
• Implementation
• Support and Maintenance

Solution Selection Review Team
• Facilitator
• Review team
• Members participate when needed
• Balance right people with manageable size

Responsibilities of Team Members
• Represent their areas
• Gather information from peers
• Review all requirements with the team

Contracting Representative

Requirements approved, decision to buy made, selection team identified

Organizational rules and regulations about contacting vendors prior to a signed contract

HIMSS

Solution-Selection Activities

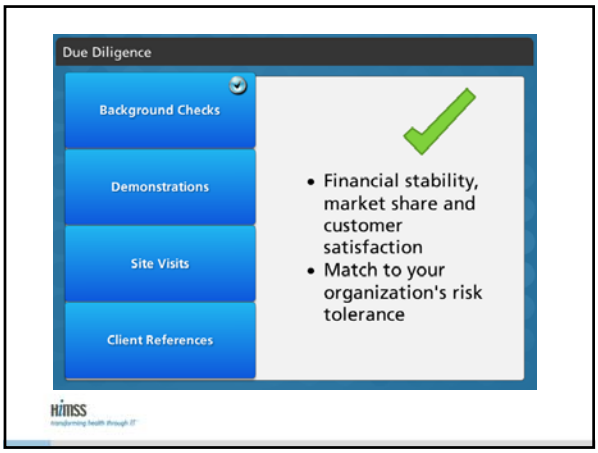
HIMSS

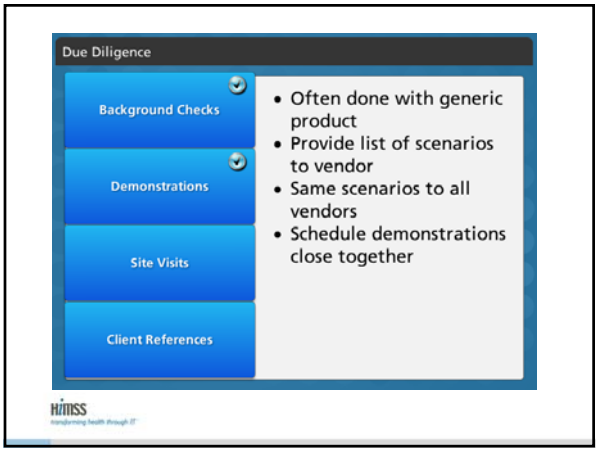
Evaluation

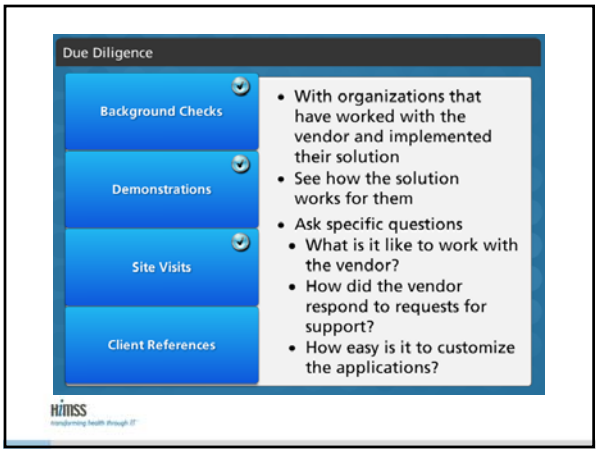
- Evaluation of RFP Responses
- Comparison to IT Strategic Plan
- Compliance with Regulatory Requirements

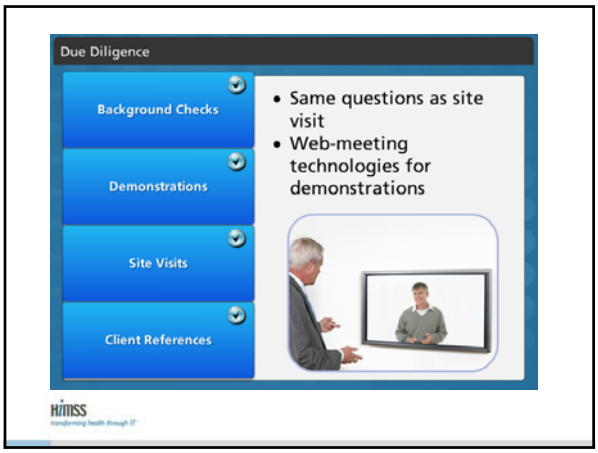
- Does the solution fit with the IT strategic plan?
- May be ok if it does not, but must be considered

HIMSS


Due Diligence
Background Checks
Demonstrations
Site Visits
Client References
• Financial stability, market share and customer satisfaction
• Match to your organization's risk tolerance


Due Diligence
Background Checks
Demonstrations
Site Visits
Client References
• Often done with generic product
• Provide list of scenarios to vendor
• Same scenarios to all vendors
• Schedule demonstrations close together


Due Diligence
Background Checks
Demonstrations
Site Visits
Client References
• With organizations that have worked with the vendor and implemented their solution
• See how the solution works for them
• Ask specific questions
• What is it like to work with the vendor?
• How did the vendor respond to requests for support?
• How easy is it to customize the applications?

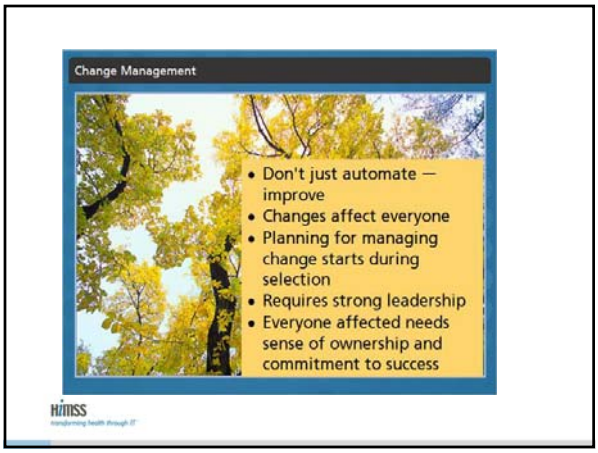

Due Diligence
Background Checks
Demonstrations
Site Visits
Client References
• Same questions as site visit
• Web-meeting technologies for demonstrations

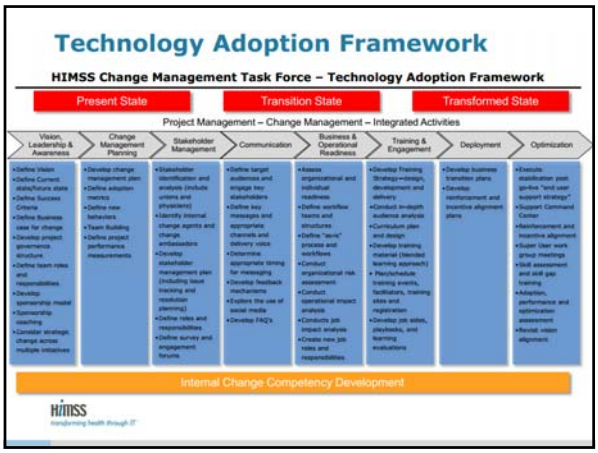
The Selection
Selection meetings
Negotiation
Selection
Budget development
• Selection Meetings
• Negotiation
• Selection
• Budget Development

Implementation
• Selection
• Implementation
• Support and Maintenance

Implementation Process Topics
Planning
Change management
Implementation strategies
Implementing solutions
System integration
Manuals and training
Activation

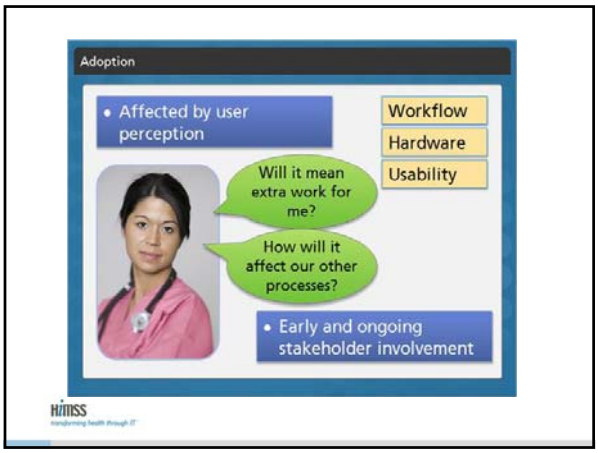
Planning
• Work required
• When it will be done
• How it will be done
• Project team's roles
• Project manager's authority
• Documentation and deliverables
• Role of governance or steering committee

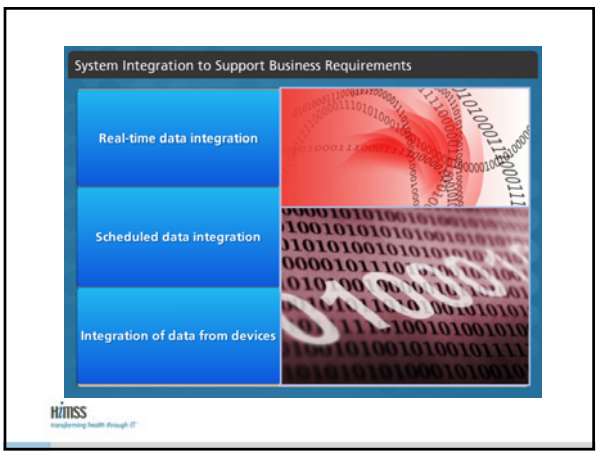

Change Management
• Don't just automate — improve
• Changes affect everyone
• Planning for managing change starts during selection
• Requires strong leadership
• Everyone affected needs sense of ownership and commitment to success

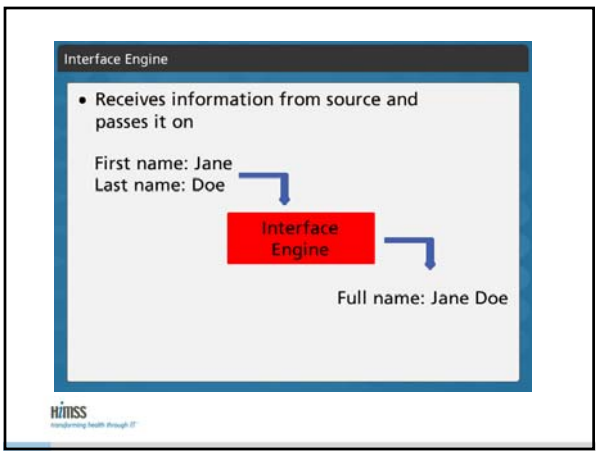

Technology Adoption Framework
HIMSS Change Management Task Force – Technology Adoption Framework
Present State
Transition State
Transformed State
Project Management – Change Management – Integrated Activities
Vision, Leadership & Awareness
Change Management Planning
Stakeholder Management
Communication
Business & Operational Readiness
Training & Engagement
Deployment
Optimization
Internal Change Competency Development
HIMSS

Implementation Strategies
Big bang
Phased by location
Phased by functionality
Pilot
Like for like
HIMSS

Implementation Solutions
Planned implementation
Selected project team
Chose strategy
Identified features to implement
Developed communication plan
HIMSS

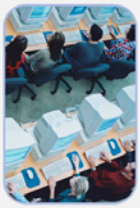

Adoption
• Affected by user perception
Workflow
Hardware
Usability
Will it mean extra work for me?
How will it affect our other processes?
• Early and ongoing stakeholder involvement


System Integration to Support Business Requirements
Real-time data integration
Scheduled data integration
Integration of data from devices


Interface Engine
• Receives information from source and passes it on
First name: Jane
Last name: Doe
Interface Engine
Full name: Jane Doe

User and Operational Manuals and Training

- Training environment for hands-on training
- Train right before activation
- Manuals, quick reference guides, support staff



HIMSS

Documentation

7 Key Areas of Documentation

- Communication plan
- Service desk knowledge base
- Data flow documents
- Workflow documents
- Configuration management plan
- Downtime procedures
- Manuals

HIMSS

HIMSS

Customer Support

- Help desk or phone number
- Goal is resolution in one call

- Help desk or ticket management system or custom database with workflows and notifications
- Timely feedback is important

HIMSS

Spotting Problems and Trends

- Trends in usage and problems
- Did the system meet the need?
- Was expected ROI realized?

Reasons to look for trends

Ways to collect data

HIMSS

Business Continuity and Disaster Recovery Plans

Business continuity plan

Disaster recovery plan

Downtime plan

HIMSS

Summary

- Identify appropriate members of a solution selection review team
- Discuss the solution selection criteria
- Identify the solution selection activities
- Describe the implementation process
- Define the methods to manage the healthcare information system

HIMSS

CPHIMS

Module 6
Systems Testing and Evaluation

HIMSS

Learning Objectives

- Define the purpose of information systems testing
- Identify five key components of a testing methodology
- Understand the major levels of testing and their intended use
- List three testing controls used to maintain the integrity of a testing process
- Identify three specific areas that are addressed in test reports
- Understand the importance of post-implementation evaluations

HIMSS

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	**3**	**3%**	**22**	**22%**	**15**	**15%**	**40**	**40%**
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

1. Purpose of Testing

1. Purpose of Testing

Risk Mitigation

- Knowledge to assist in managing risks
  - Improve system performance
  - Optimize system use
  - Sustain operations
  - Technical and operational limitations
  - Patient safety risks

HIMSS

1. Purpose of Testing

Hardware and Software

- Hardware
  - Evaluation of physical components
- Software
  - Evaluation of the quality of the software product
  - Objective, independent view of risks involved in implementing the software

HIMSS

1. Purpose of Testing

Comprehensive Testing

Validating and verifying:

- Meets requirements
- Works as expected
- Can be implemented across the organization
- Satisfies needs of stakeholders

Bugs = $59.5 billion annually in U.S.

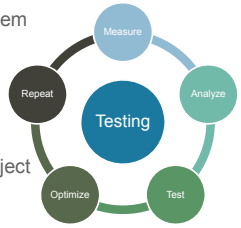
HIMSS

1. Purpose of Testing

2. Test Methodology

Test Strategy

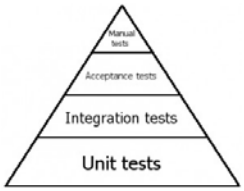
- A formal description of how a system will be tested:
  - The test team analyzes the requirements,
  - Writes the test strategy,
  - Reviews the plan with the project team



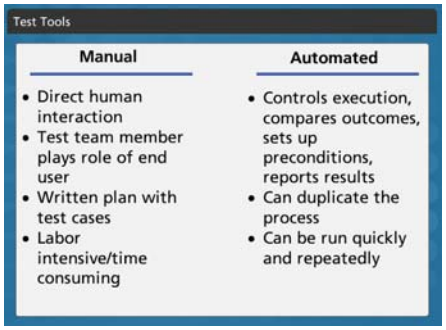
2. Test Methodology

Test Strategy

- Common test strategy components include:
  - Testing scope and objectives
  - Current business issues
  - Roles and responsibilities
  - Status reporting
  - Test methods
  - Industry standards
  - Test tools
  - Measurements and metrics
  - Risks and mitigations
  - Defect reporting and tracking
  - Change configuration management



2. Test Methodology



HIMSS

2. Test Methodology

Testing Methodologies: Waterfall

Waterfall Model
The waterfall model is one of the earliest structured models for software development. It consists of the following sequential phases through which the development life cycle progresses:

System feasibility. In this phase, you consider the various aspects of the targeted business process, find out which aspects are worth incorporating into a system, and evaluate various approaches to building the required software.
Requirement analysis. In this phase, you capture software requirements in such a way that they can be translated into actual use cases for the system. The requirements can derive from use cases, performance goals, target deployment, and so on.
System design. In this phase, you identify the interacting components that make up the system. You define the exposed interfaces, the communication between the interfaces, key algorithms used, and the sequence of interaction. An architecture and design review is conducted at the end of this phase to ensure that the design conforms to the previously defined requirements.
Coding and unit testing. In this phase, you write code for the modules that make up the system. You also review the code and individually test the functionality of each module.
Integration and system testing. In this phase, you integrate all of the modules in the system and test them as a single system for all of the use cases, making sure that the modules meet the requirements.
Deployment and maintenance. In this phase, you deploy the software system in the production environment. You then correct any errors that are identified in this phase, and add or modify functionality based on the updated requirements.

http://msdn.microsoft.com/en-us/library/ff649520.aspx

HIMSS

2. Test Methodology

Testing Methodologies: Iterative

Incremental or Iterative Development
The incremental, or *iterative*, development model breaks the project into small parts. Each part is subjected to multiple iterations of the waterfall model. At the end of each iteration, a new module is completed or an existing one is improved on, the module is integrated into the structure, and the structure is then tested as a whole.

For example, using the iterative development model, a project can be divided into 12 one- to four-week iterations. The system is tested at the end of each iteration, and the test feedback is immediately incorporated at the end of each test cycle. The time required for successive iterations can be reduced based on the experience gained from past iterations. The system grows by adding new functions during the development portion of each iteration. Each cycle tackles a relatively small set of requirements; therefore, testing evolves as the system evolves. In contrast, in a classic waterfall life cycle, each phase (requirement analysis, system design, and so on) occurs once in the development cycle for the entire set of system requirements.

http://msdn.microsoft.com/en-us/library/ff649520.aspx

HIMSS

2. Test Methodology

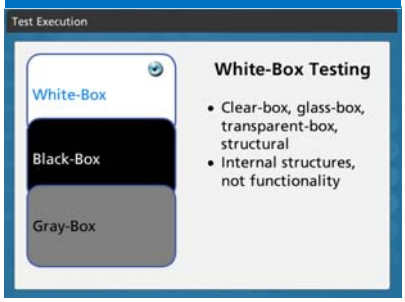
Testing Methodologies: Agile

Agile Methodology
Most software development life cycle methodologies are either iterative or follow a sequential model (as the waterfall model does). As software development becomes more complex, these models cannot efficiently adapt to the continuous and numerous changes that occur. Agile methodology was developed to respond to changes quickly and smoothly. Although the iterative methodologies tend to remove the disadvantage of sequential models, they still are based on the traditional waterfall approach. Agile methodology is a collection of values, principles, and practices that incorporates iterative development, test, and feedback into a new style of development. For an overview of agile methodology, see the Agile Modeling site at http://www.agilemodeling.com/.

http://msdn.microsoft.com/en-us/library/ff649520.aspx

2. Test Methodology

Test Execution 1 of 3 – White-Box Testing



3. Test Execution

Test Execution 2 of 3 – Black-Box Testing

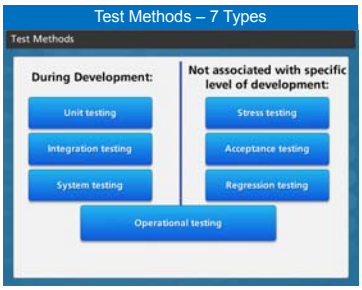
3. Test Execution

Test Execution 3 of 3 – Gray-Box Testing

HIMSS

3. Test Execution

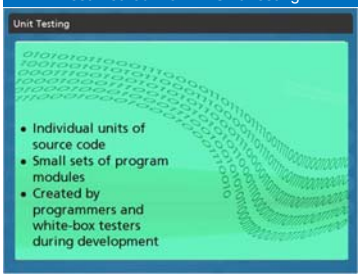
Test Methods – 7 Types



HIMSS

3. Test Execution

Test Method 1 of 7 – Unit Testing



HIMSS

3. Test Execution

Test Method 2 of 7 – System Testing

System Testing

- Conducted on complete, integrated system
- Evaluates system's compliance with requirements
- Detects inconsistencies between:
  - Software from integration testing (assemblages)
  - Assemblages and hardware
  - Exchange of data to other applications

HIMSS

3. Test Execution

Test Method 3 of 7 – Integration Testing

Integration Testing

- Combine units to test as a group after unit testing
- Output is integrated system ready for system testing
- Best suited for gray-box testing

HIMSS

3. Test Execution

Test Method 4 of 7 – Stress Testing

Stress Testing

- Stability with heavy load
  - To the breaking point

- Ensure against crashes

HIMSS

3. Test Execution

Test Method 5 of 7 – Acceptance Testing

Acceptance Testing

- Determines if requirements are met
- Validates successful system implementation
- By business customers prior to accepting transfer of ownership
- Final quality gateway
- Sign-off by system sponsors
- Also conducted for major upgrades and patches

HIMSS

3. Test Execution

Test Method 6 of 7 – Regression Testing

Regression Testing

- Uncovers new bugs or errors in existing system that has changed

- Ensure that a planned change does not introduce new faults

HIMSS

3. Test Execution

Test Method 7 of 7 – Operational Testing

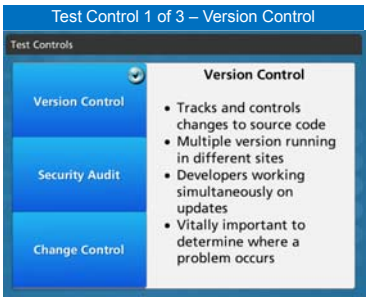
Operational Testing

- Ensure the solution delivers ROI and benefits intended
- In production environment
- Observed by independent testers
- Often repeated 90 to 180 days after deployment

HIMSS

3. Test Execution

Test Control 1 of 3 – Version Control



HIMSS

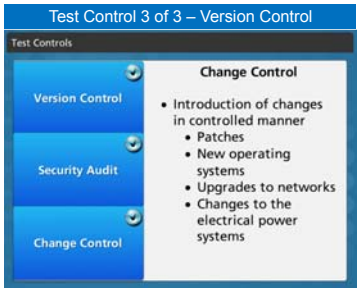
4. Test Controls

Test Control 2 of 3 – Security Audit

HIMSS

4. Test Controls

Test Control 3 of 3 – Version Control



HIMSS

4. Test Controls

Test Reporting

- Throughout the testing process, not just at conclusion of test event
- Challenges
  - Tailoring reports
  - Clarifying intent
  - Explaining process
  - Understanding metrics
- Address mission, systems, risks, techniques, environment, status, obstacles

HIMSS

5. Test Reports

Final Evaluation

Findings, conclusions, recommendations

- What will the effect be on ROI?
- Does the system meet our quality and performance expectations?
- Is the system ready for users?
- What can we expect when *x* people simultaneously use the system?
- What are we risking if we go live with the system now?

HIMSS

6. Final Evaluation

Before and After Go Live

- Before: end-user training

- After:
  - User satisfaction
  - System usability
  - Impact on business and patient care
  - Potential for expansion or integration

HIMSS

6. Final Evaluation

Summary

- Define the purpose of information systems testing
- Identify five key components of a testing methodology
- Understand the major levels of testing and their intended use
- List three testing controls used to maintain the integrity of a testing process
- Identify three specific areas that are addressed in test reports
- Understand the importance of post-implementation evaluations

HIMSS

CPHIMS

Module 7 Privacy and Security

HIMSS

Learning Objectives

- Identify the tools that can be used to perform an organizational risk assessment
- Discuss the three main categories of data management security safeguards
- Describe the components of an organization's disaster recovery and business continuity plans

HIMSS

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	**3**	**3%**	**22**	**22%**	**15**	**15%**	**40**	**40%**
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

Importance of Privacy and Security

- Concerns about Privacy and Security are not new
- The ease and scale of data breaches, medical identity left, and loss are!
- *Healthcare IT News* (examples)

UPMC breach strikes 27,000 employees
UPMC officials say the number of employees affected by a data breach at the renowned medical center is much higher than originally reported -- rising from 322 employees first disclosed on March 6, now up to 27,000 out of a total of 62,000 employees.

Hacker group hits Boston Children's
The Boston Children's Hospital has found itself the target of multiple cyberattacks throughout the past week, reportedly with the renowned hacker group Anonymous at the center of it.

Healthcare security stuck in Stone Age
Healthcare has a few things to do differently in the privacy and security arena -- one of them being: Start taking it seriously. This according to Verizon's annual breach report.

Requirements, Policies, and Procedures

Regulations and Legal Requirements	• Deal with limits on the use and disclosure of health information
Policies	• Describe an organizations rules and regulations
Procedures	• Stepwise accounting of how tasks are to be performed to ensure compliance with policies
Security Policies and Procedures	• Provide controls on electronic and physical access to health data

Confidentiality, Integrity, Availability

Confidentiality	• Limit disclosure to comply with policies and regulations • Maintain trust partners
Integrity	• Accuracy and completeness of data • Consistency with its source • Audits
Availability	• Protection from unplanned destruction • Access by patients when they need it • Survival closure, merger, or similar events

User Access

- Maintain confidentiality, integrity, and availability
- Prevent access by unauthorized users
- Ensure A-A-A

Authentication	Access	Accounting

• Proves that users are who they say they are
• Involves
  • something a user knows,
  • something a user has
  • something a user is
	• Involves access privileges
	• Involves **minimum access necessary**
	• **Role-based access** is recommended
		• Includes audit reporting
		• These can be scheduled or random

Chief Information Security Officer Role

- **Chief Information Security Officer**
  - Top security official in organization
    - Attain executive management support
    - Gain seat "at the table", reporting to CEO (or one level below)
    - Develop strategic security plan that aligns with the business that includes all departments and service lines
    - Oversee the security program (ISO/IEC 27001, HITRUST, etc.)
    - Develop policies and procedures
    - Champion security awareness training
    - Establish a culture of security
    - Ensure compliance and auditing of security and risk
    - Oversee data breach investigations and forensics
    - Develop Disaster Recovery and Business Continuity
    - Partners closely with Privacy and Compliance Officers

Today's Challenges

Patient Sensitive Health Information

- Found in Electronic Health Record (EHR), Personal Health Record (PHR), E-prescribing, and health information exchange systems

Risk Assessment

What is a risk assessment?

- Threats
- Likelihood
- Vulnerabilities

1. Risk Assessment

Risk Assessment Tools

Policies and Procedures	• Review of current policies, procedures, contracts, and other documents relevant to privacy and security
Surveys and Questionnaires	• Organizational questionnaires, surveys, and interviews that gauge the knowledge of and compliance with privacy and security requirements
Walk-throughs	• Facility walkthroughs to identify areas where physical security limitations need to be addressed
Penetration Tests	• Technical penetration attempts or other tests to assess security vulnerabilities
Laws and Regulations	• Updated legislation, regulations, or international agreements that may drive new approaches
Security Breach Analysis	• Root cause analysis of any security breach that may have occurred since the last assessment

Risk Assessment Objective

Risk Assessment Summary Involves:	Risk Assessment Follow Up Actions	Risk Assessment Remediation Process
• Risk assessment analysis • Audit reports • Reports of anomalous system behavior • Vendor advisories • System security analysis	• **Accept** • or • **Mitigate**	• Review and update policies and procedures • Educate and train staff • Implement physical, administrative, and technical safeguard controls

HIMSS

1. Risk Assessment

Data Management Controls

- Control electronic access to systems
- Control physical access to locations and devices
- Manage data in transit and at rest (encryption)
- 3 categories show below:

Administrative Safeguards	Technical Safeguards	Physical Safeguards
Ongoing education	Network firewalls	Data centers outside the flood plains
Policies and procedures	Encryption	Redundant power sources
	Secure protocols (AAA, etc.)	Limited access to critical equipment or rooms

HIMSS

2. Data Management

Disaster Recovery and Business Continuity

Analysis of Applications and Data Criticality
- Applications and data need to be prioritized by priority

Data Backup Plan
- A data backup plan is needed to backup mission critical data to an offsite location

Disaster Recovery Plan
- Procedures must exist that detail how to restore data after a loss

Emergency Mode Operation Plan
- Downtime procedures must outline how to operator while systems are down

Testing and Revision
- All disaster recovery procedures must be tested regularly (annually) and updated

HIMSS

3. Disaster Recovery & Business Continuity

Auditing

- Allows organization to monitor access to protected data using an audit trail
- Audit trail is **a chronological record of activities occurring in the system**
- Identifies breaches and gaps between policies/procedures and practice
- Involves evaluating human behavior and information systems
- Should be done on an ongoing basis (annually)
- Can be done with automated systems or individual auditors

HIMSS

4. Auditing

Privacy/Security is Everyone's Concern

- It's everyone's role, not just the security staff or CISO
- From Board of Directors & CEO to Volunteers
- 25% of internal data theft done w/hard copies — Symantec Report
- Most security problems discovered by non-IT staff — Techtarget.com
- "Culture is often more powerful than law" — Glenn Harlan Reynolds

Summary

Describe the tools that can be used to perform an organizational risk assessment

Identify the three main categories of data management security safeguards

Describe the components that should be include in an organization's disaster recovery and business continuity plans

HIMSS

CPHIMS

Module 8
Leadership

HIMSS

Learning Objectives

- Identify the skills needed to guide and facilitate the development of IT organizations
- Assess current systems status by interacting with the user community
- Develop strategic analyses to better align the IT organization with the organization's mission, vision, goals and strategies
- Learn to balance the necessary relationships with vendors while effectively maintaining a sound business ethic

HIMSS

CPHIMS Competency Areas

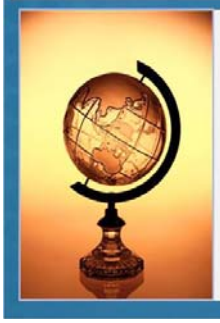
CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	3	3%	22	22%	15	15%	40	40%
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	5	5%	18	18%	9	9%	32	32%
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

HIMSS
transforming health through IT

HIMSS
transforming health through IT

HIMSS
transforming health through IT

Complying with Legal and Regulatory Standards



- Complex web of legal, regulatory, accreditation and other compliance issues
- Vary by country
- Key individuals:
  - Corporate compliance officer
  - Legal counsel
  - Lead Joint Commission liaison

HIMSS
transforming health through IT

Where Responsibility Falls

- Corporate compliance committee
- Joint Commission International steering committee
- Audit and education committee

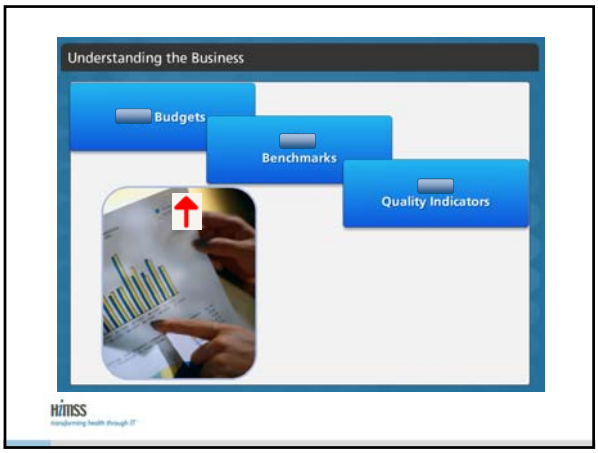
HIMSS
transforming health through IT

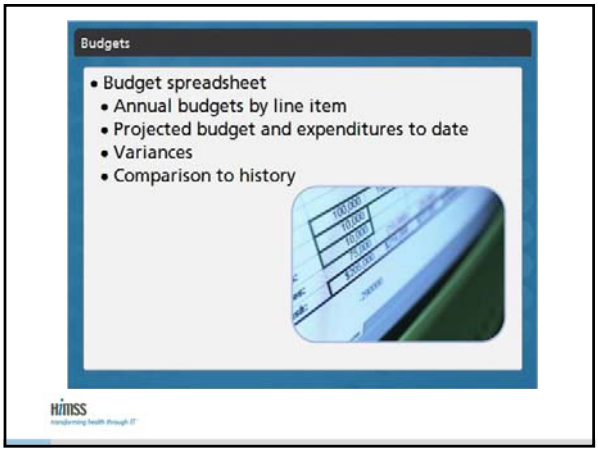
Adhering to Ethical Business Principles

- Code of Business or Corporate Ethics
- Knowledge
- Adherence

Corporate Compliance | Compliance Programs | Fairness and Equity

HIMSS
transforming health through IT


Understanding the Business
Budgets
Benchmarks
Quality Indicators


Budgets
• Budget spreadsheet
• Annual budgets by line item
• Projected budget and expenditures to date
• Variances
• Comparison to history

Revenue and Expenses
Calendar
• Some expenses spread evenly over the year
• Other expenses have unique timing
• Well-constructed report explains timing of events

Classification of Expenses

Capital	Operating
• Assets with enduring value • Depreciation	• Salaries • Benefits • Maintenance • Travel • Utilities • Supplies

HIMSS

Understanding the Business

HIMSS

Benchmarks

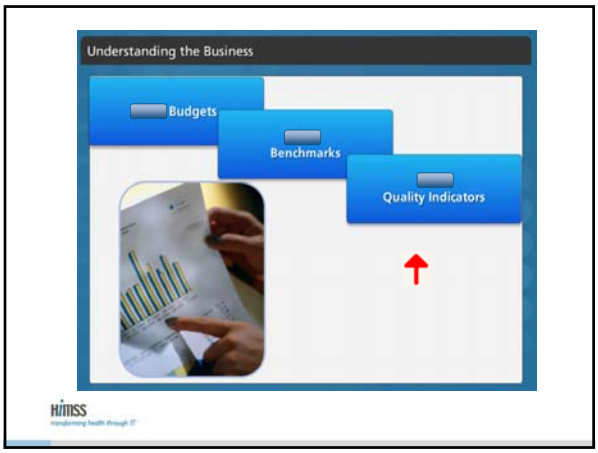
To compare one organization to another, national averages or internal goals

- Days in accounts receivable (AR days)
- Discharged not final billed (DNFB)
- Days cash on hand
- Quality, safety, regulatory, accreditation measures

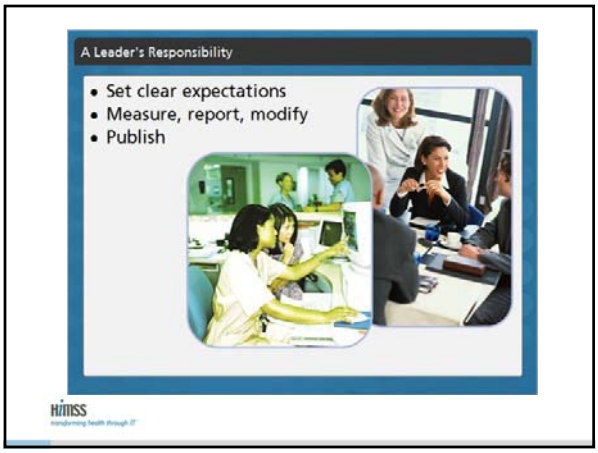
Average amount of time it takes to receive payment

Number of days the organization could continue to operate if no further funds received

HIMSS


Understanding the Business
Budgets
Benchmarks
Quality Indicators

Quality Indicators
• Fixed measures set by Department of Health or payers to the organization
• Each country unique
• External services aggregate data


A Leader's Responsibility
• Set clear expectations
• Measure, report, modify
• Publish

System Effectiveness and User Satisfaction

- Baseline assessment
- Both objective and subjective assessment

View an example of why it is important to have both objective and subjective assessment

- 99% uptime tracks well
- Users struggle with 1.75 hours downtime per week

- Healthcare needs 99.999%

HIMSS

Baseline Analysis

In-person observation

Face-to-face interviews

Groups of users: departmental meeting or focus groups

HIMSS

Listen to the Stakeholders!

- Systems used
- How used
- Expectations
- Experiences
- Requests for improvements

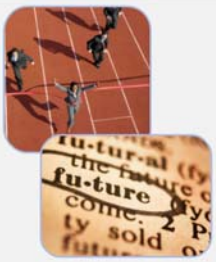
Be open-minded

HIMSS

Quality of Service Control Chart

Strategic Planning

- Leaders set goals
- Strategy: Formal or informal plan of action to achieve a goal.



- Mission
- Values
- Vision
- Goals

Strategic Planning

- Leaders set goals
- Strategy: Formal or informal plan of action to achieve a goal.

- Mission

- Statement of why the organization exists
- "Do good, have fun, make money"
- Set by CEO and Board of Directors

Strategic Planning

- Leaders set goals
- Strategy: Formal or informal plan of action to achieve a goal.

Values

- What the company supports and appreciates most
- Compassion, service, respect

HIMSS

Strategic Planning

- Leaders set goals
- Strategy: Formal or informal plan of action to achieve a goal.

Vision

- Where it wants to go
- What it wants to be

HIMSS

Strategic Planning

- Leaders set goals
- Strategy: Formal or informal plan of action to achieve a goal.

Goals

- Measures to support vision accomplishment

HIMSS

Strategic Planning

- Leaders set goals
- Strategy: Formal or informal plan of action to achieve a goal.

SMART

- Specific, Measurable, Attainable, Relevant, Time Bound

Tactics Support Goals

- Focused goals bring clarity to tactics
- Leaders are organization's conscience
- Clearly prioritize activities
- Be prepared: change is inevitable

IT Strategic Plan

Organization's strategic plan

Reference tool for prioritizing work throughout the organization

IT strategic plan

Section or addendum to organization's strategic plan

IT Strategic Plan

Organization's strategic plan → IT strategic plan

Include input from organizational leaders and staff

How to Begin

Validate organization's plan if more than 12 months old

Steps to Develop the IT Plan

1. Initiate document by including vision, goals, strategies of the organization
2. Identify current state and assess effectiveness
3. Define gaps
4. Compare timeline for staff to develop and costs for external development or purchase
5. Identify who will take responsibility for the initiatives addressed

The Plan

- map of organizational strategies and supporting applications and processes
- gap analysis
- pure IT initiatives and personnel needs

HIMSS

Implementing the IT Strategic Plan

- Regularly maintained
- Part of the organizational strategic plan
- Individuals' performance objectives tied to the plan
- Monitoring against the plan
- Color-coded scorecard of progress and achievement
- Treat the plan as a project

HIMSS

Policies and Procedures for Information Systems Management

?

Why have policies and procedures?

To facilitate the standardization of activities and operations for employees, patients and guests.

HIMSS

Whether and Where to Implement

- From entire company to the very smallest operation

?

What questions must leaders answer?

HIMSS

Auditing and Reporting

- Do what is measurable
- Measure what you do
- Review what you have measured
- Act on the results
  - Embed consequences of noncompliance in the policy
  - Note any and all exceptions in the policy

HIMSS

Project Communication

- Initial brief summary and supporting documentation
  - Timeline and completion status
  - Color-coded summary of tasks
  - Arrows
  - Red, yellow, green
  - Single page, summary of issues, responsible party, estimated date of resolution
- Budget status

HIMSS

Facilitating Difficult Discussions

- Difficult or complex discussions are different
  - Know issues, controversies, positions
  - Put controversial decisions at top of agenda or sole item on agenda
  - Begin discussions in advance of meeting

HIMSS

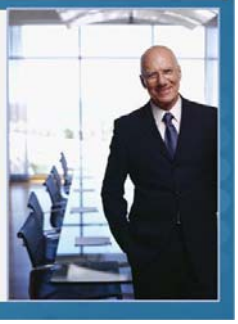
Maintain Control

- Use Robert's Rules of Order
- Establish ground rules
- Record motions, seconds, key discussions
- Keep detailed record of votes
- Do not let one person dominate
- Focus on contributing new insights

HIMSS

Role of the Chairperson

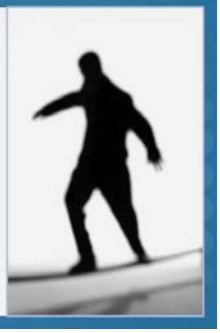
- Do not dominate the conversation
- Guide the conversation
- Ask probing questions
- Contribute or highlight commentary
- Use straw poll
- Keep attendees accountable for problem solving



HIMSS

Risk Management

- Magnitude of risk: how big an impact?
- Likelihood of risk: will it in fact occur?
- Low, medium, high



HIMSS

Risk Management

		Magnitude of Risk		
		Low 1	Medium 2	High 3
Likelihood of Risk Occurring	Low 1	1	2	3
	Medium 2	2	4	6
	High 3	3	6	9

Contingency plan: alternative path, project or process that would be considered in the event that the primary path is disrupted.

HIMSS

Risk Management and Business Continuity

- Greater prominence in healthcare
- Costs associated with mitigating risks

HIMSS

Summary

- Understand skills needed to guide and facilitate development of information technology organizations
- Effectively communicate in both written and oral presentations and organize complex meeting structures
- Assess the current systems status
- Develop strategic analyses to better align the IT organization with the organization's mission, vision, goals and strategies
- Maintain a sound business ethic

HIMSS

HIMSS CPHIMS

Module 9 Administration Management

HIMSS

Learning Objectives

- Define roles and responsibilities for IT-related functions
- Assure staff competency in information and management system skills
- Manage projects and portfolios of projects
- Manage relationships with vendors
- Facilitate steering committee meetings and/or topics
- Ensure adherence to industry best practices
- Maintain system, operational and department documentation
- Provide customer service
- Manage budget and financial risks
- Manage customer relationships with business leaders

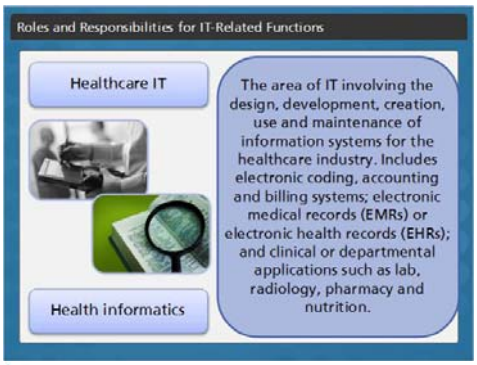
HIMSS

CPHIMS Competency Areas

CPHIMS Examination Content Outline (effective February, 2014)	Cognitive Level						Total	
	Recall		Application		Analysis			
1. General	22	22%	6	6%	0	0%	28	28%
A. Healthcare Environment	10	10%	4	4%	0	0%	14	14%
B. Technology Environment	12	12%	2	2%	0	0%	14	14%
2. Systems	3	3%	22	22%	15	15%	40	40%
A. Analysis	2	2%	10	10%	4	4%	16	16%
B. Design	0	0%	3	3%	3	3%	6	6%
C. Selection, Implementation, Support, and Maintenance	0	0%	4	4%	3	3%	7	7%
D. Testing and Evaluation	0	0%	2	2%	3	3%	5	5%
E. Privacy and Security	1	1%	3	3%	2	2%	6	6%
3. Administration	**5**	**5%**	**18**	**18%**	**9**	**9%**	**32**	**32%**
A. Leadership	3	3%	10	10%	9	9%	22	22%
B. Management	2	2%	8	8%	0	0%	10	10%
Total	30	30%	46	46%	24	24%	100	100%

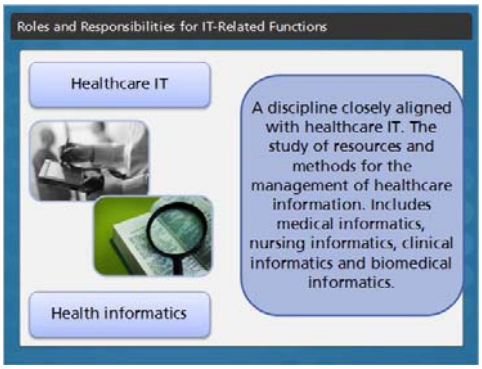
HIMSS

HIMSS



HIMSS

Roles and Responsibilities for IT-Related Functions



HIMSS

Practice workflow/information management redesign specialist

Workers in this role assist in reorganizing the work of a provider to take full advantage of the features of healthcare IT to improve health and care.

Implementation manager

Workers in this role provide on-site management of mobile adoption support teams for the period of time before and during implementation of healthcare IT systems in clinical and public health settings.

HIMSS

Implementation support specialist

Workers in this role provide on-site user support for the period of time before and during implementation of healthcare IT systems in clinical and public health settings. These individuals will provide support services above and beyond what is provided by the vendor to be sure the technology functions properly and is configured to meet the needs of the redesigned practice workflow.

Clinician/practitioner consultant

This role is similar to the practice workflow and information management redesign specialist but brings to bear the background and experience of a licensed clinician or public health professional.

HIMSS

Software support technician

Workers in this role maintain systems in clinical and public health settings, including patching and upgrading of software. They also provide one-on-one support in a traditional help-desk model to individual users with questions or problems.

Trainer

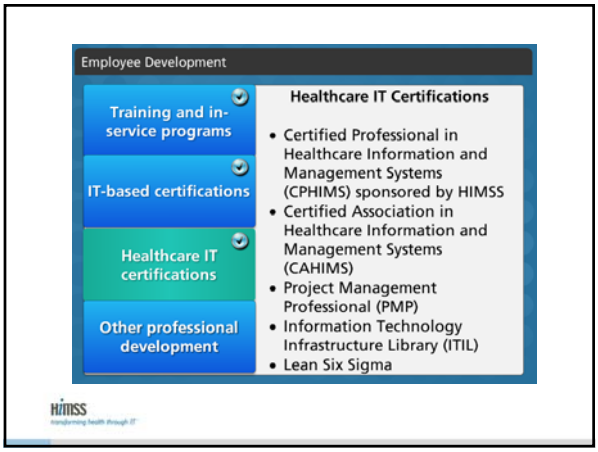
Workers in this role use adult learning principles to design and deliver training programs to employees in clinical and public health settings.

HIMSS

HIMSS

HIMSS

Employee Development
Training and in-service programs
IT-based certifications
Healthcare IT certifications
Other professional development
IT-Based Certifications
• Provide framework for learning
• Provide credentials
• Keep certifications active
HIMSS


Employee Development
Training and in-service programs
IT-based certifications
Healthcare IT certifications
Other professional development
Healthcare IT Certifications
• Certified Professional in Healthcare Information and Management Systems (CPHIMS) sponsored by HIMSS
• Certified Association in Healthcare Information and Management Systems (CAHIMS)
• Project Management Professional (PMP)
• Information Technology Infrastructure Library (ITIL)
• Lean Six Sigma
HIMSS

Employee Development
Training and in-service programs
IT-based certifications
Healthcare IT certifications
Other professional development
Other Professional Development
• Healthcare IT conferences and workshops
• Programs sponsored by national and local professional associations
• University certificate and degree programs in healthcare IT, informatics, information management, information systems
• Self- or group-study
HIMSS

Performance Evaluation

Goals → Assessment → Feedback

- Work
- Outcomes
- Attitudes
- Interpersonal skills
- Professional growth
- Adherence to organizational values

HIMSS

Methods

- Rating scale: numbers or words indicate level of performance

Teamwork

Dependability

Communication

Initiative

Quality

Adherence to values

Quantity

HIMSS

Methods

- Rating scale: numbers or words indicate level of performance

- 360 - degree
  - Team members
  - Subordinates
  - Peers
  - Other departments
  - Outside customers
  - Vendors
  - Self-assessment

HIMSS

Feedback

- Regular, ongoing
- No surprises at year end
- Opportunity to improve
- Reinforcement of positive behavior

HIMSS

Disciplinary Action

- Documentation of all steps along the way
- Goal: help the employee improve performance
- Involve Human Resources

HIMSS

Managing Vendor Relationships

- Expertise and support
- Increased customer satisfaction, reduced costs, better quality, better service
- Quick to remedy
- Not simply negotiating lowest price

HIMSS

Vendor Management Process

- Select right vendor for right reasons
- Analyze requirements, perform search, select winning candidate and negotiate contract
- Monitor vendor performance
- Communicate regularly

HIMSS

Common Pitfalls

- Do not confuse vendor selection with vendor management
- Do not select vendor based on price alone
- Do not forget to evaluate how vendor relationships affect business

HIMSS

Steering Committees

- Essential to providing guidance and practical direction
- Advisory committee of high-level stakeholders and experts
- Focus
  - IT strategic planning
  - Project prioritization
  - Project approval

HIMSS

Ensure Success
Governance
Strategic planning
Project prioritization
Improve the value of IT to the business units.
Clear objectives
Executive participation
Commitment to meet regularly

Customer Service
Customer-focused
Customer-centric
"Placing the customer as the center or focus of design or service"

Service Level Agreement (SLA)
SLAs
• Level of service expected
• Metrics
• Resources
• Reporting
What is included in an SLA?

Request Tracking

Help desk triage

Issue tracking

User satisfaction surveys

Help-Desk Triage

- Each reported problem assigned a priority level
- Worked accordingly

HIMSS

Request Tracking

Help desk triage

Issue tracking

User satisfaction surveys

Issue Tracking

- Monitoring of open, new, closed service requests
- Identifies problems
- Warns when approaching time limit in SLA

HIMSS

Request Tracking

Help desk triage

Issue tracking

User satisfaction surveys

User Satisfaction Surveys

- Assess how well provider met service objectives
- Generate excellent opportunities

HIMSS

Measuring the Help Desk

- First call resolution rate
  - Service requests resolved during initial call
  - High if service technicians well trained with materials for reference and troubleshooting readily available

HIMSS

Measuring the Help Desk

- Call abandonment rate
- When callers hang up without speaking to a technician
- Usually higher when wait times are high

HIMSS

Other Metrics

System Performance
- System uptime
- System response time

What if there is a discrepancy between our metrics and our user satisfaction?

HIMSS

Problem Resolution

- If one customer is disappointed, others probably are as well.
  - Explanation is in order
  - Re-evaluate policies

HIMSS

Budget Risk Management and Financial Risk Management

Financial Risk Management

Budget Risk Management

HIMSS

Financial Risk Management

Understanding = Better Decisions

Reduce and protect against unpredictability of future costs

HIMSS

Core Financial Skills and Financial Methods and Tools

Core Financial Skills	Financial Methods and Tools
• Budgeting • Planning • Purchasing • Operating expenses • Accounting • Models • Compliance	• Return on Investment (ROI) • Budget-tracking • Revenue-creation • Monthly reports and variations • Technology pilots • SLAs for vendors • Buy-in from customers

HIMSS
transforming health through IT

Customer Relationship Management (CRM)

- Approach with customers, patients, vendors, other business associates

- Attract new customers, retain current customers, re-establish relationships with past customers
- Leverage technology

HIMSS
transforming health through IT

Healthcare Is Service-Driven

HIMSS
transforming health through IT

How Do You Improve Customer Satisfaction Levels?

- Systems approach
- Right team
- Effective service delivery
- Opportunities for improvement
- Management involvement

Management Involvement

- Senior management
- Mid-level management
- Engage early and often
- Use as facilitators
- Reward
- Motivate managers to be examples

HIMSS

Culture

Build a Culture with Focus on Customer Relations

HIMSS

Summary

- Define roles and responsibilities for IT-related functions
- Assure staff competency
- Manage projects and portfolios of projects
- Manage relationships with vendors
- Facilitate steering committee meetings and/or topics
- Assure adherence to industry best practices
- Use well-defined customer service processes
- Maintain system, operational and department documentation
- Manage financial and budget risks
- Manage customer relationships

HIMSS

HIMSS

Would Like to Thank

HIMSS CPHIMS

Certified Professional in Healthcare Information & Management Systems

Review Course Participants

And Wish You Continued Success in Health IT

HIMSS

transforming health through IT