Notes to Instructors

This Instructor Manual is a resource for instructors using this component. Each component is broken down into units, which include the following elements:

- Learning objectives
- Suggested student readings, texts, reference links to supplement the narrated PowerPoint slides
- Lectures (voiceover PowerPoint in Flash format); PowerPoint slides (Microsoft PowerPoint format), lecture transcripts (Microsoft Word format); and audio files (MP3 format) for each lecture
- Self-assessment questions reflecting Unit Objectives with answer keys and/or expected outcomes
- Application Activities (e.g., discussion questions, assignments, projects) with instructor guidelines, answer keys and/or expected outcomes
- Labs/Simulations for virtual machines
Component Overview

This component covers fundamentals of selection, installation and maintenance of typical Electronic Health Records (EHR) systems. Students will be introduced to the principles underlying system configuration including basic hardware and software components, principles of system selection, planning, testing, troubleshooting, and final deployment. System security and procedures will also be introduced in this component.

Each Learning Unit requires 2-5 contact/instructional hours and an additional 6-15 hours of independent or team work on the part of the student in order to be completed successfully. Each unit contains more material than would likely be used in any one teaching/learning experience so that the instructor can pick and choose material most applicable to local workforce needs.

Unit 1, Elements of a Typical EHR System
Unit 2, System Selection – Software and Certification
Unit 3, System Selection – Functional and Technical Requirements
Unit 4, Structured Systems Analysis and Design
Unit 5, Software Development Life Cycle
Unit 6, System Security Procedures and Standards
Unit 7, System Interfaces and Integration
Unit 8, Troubleshooting; Maintenance and Upgrades; Interaction with Vendors, Developers, and Users
Unit 9, Creating Fault Tolerant Systems, Backups, and Decommissioning
Unit 10, Developing a Test Strategy and Test Plan
Unit 11, Pilot Testing and Full Scale Deployment

This entire Component is estimated to require 18-45 total contact/instructional hours plus 54-135 additional hours of independent or team work, depending on the learning activities and assessments used within each unit.

Component Objectives

At the completion of this component, the student will be able to:

- Describe the use of client and server hardware for access to and storage of EHRs
- Describe network needs for access to and storage of EHRs
- Identify the application software and back-end data storage software needed for a comprehensive, effective Health IT System
• Compare and contrast COTS (Commercial Off-The-Shelf) and In-House /homegrown systems and describe their relative advantages and disadvantages
• Verify system compliance with ONC-ATCB certification
• Identify purpose and categories of ARRA “Meaningful Use” criteria
• Identify 12 possible steps to choosing an EHR system
• Gather functional requirements from institution and users
• Document use-cases and relate them to functional requirements
• Identify the 8 basic components to a project plan
• Define the role of a project manager
• Equate the basic project plan components to a typical EHR implementation plan
• Create a project plan for system design and implementation
• Define the steps of the Software Development Life Cycle (SDLC) and the purpose and importance of each.
• Describe different models of the SDLC and their key differences.
• Describe how and why an HIT software application would go through the SDLC
• Identify regulatory requirements for EHRS and integrate into the project plan
• Identify best practices for OS and network system security installation and patches (such as those provided by vendors, SANs, and ISC2) and integrate into project plan
• Identify and assess protection measures including access control, firewalls, intrusion detection and encryption
• Provide training for system users regarding the methods and importance of security compliance
• Determine and document system interfaces and integration requirements
• Describe the pitfalls associated with installing a new application in an environment of pre-existing applications
• Give examples of interfacing modalities
• Identify and implement an effective troubleshooting procedure for reporting, evaluating, fixing, deploying, and follow-up of errors, problems, or limitations for the system
• Integrate downtime schedule for OS, network, database, and client application maintenance and updates
- Develop a process for communicating requirements and supplying updates between vendors/developer and users
- Create a baseline for system performance measurement and comparison for troubleshooting
- Create redundancy and fault-tolerance in systems for access and data storage, providing high performance and reliability
- Backup and restore databases, applications, and operating systems
- Develop a plan for decommissioning systems and data
- Gather user feedback and performance baseline for system validation and testing
- Document problems with their resolution status
- Create, execute, and document a test plan
- Identify pilot group and plan scope of pilot
- Install pilot system, train pilot users, and make pilot available
- Gather and prioritize feedback from pilot test, revising project plan if necessary
- Develop and implement strategy for:
  - Communicating deployment plan to end users and management
  - Technical support of deployment (e.g. live on-site support versus phone/Internet support)
  - Getting feedback from end users following deployment
  - Evaluating usage and capacity of system resources under conditions of full deployment
- Deploy revised system
Component Authors

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 Likewise, the above also applies to the Curriculum Development Centers (including Columbia University, Duke University, Johns Hopkins University, Oregon Health & Science University, University of Alabama at Birmingham, and their affiliated entities).
Component 8/Unit 1

Unit Title
Elements of a Typical EHR System

Unit Description
This unit provides an overview of what a typical electronic health record system is and focuses on the elements that make up such a system -- hardware, networks, software, and storage requirements.

Unit Objectives
By the end of this unit the student will be able to:
1. Describe the use of client and server hardware for access to and storage of EHRs
2. Describe network needs for access to and storage of EHRs
3. Identify the application software and back-end data storage software needed for a comprehensive, effective Health IT System

Unit Topics / Lecture Titles
1a Elements of a Typical Electronic Health Record System
1b Elements of a Typical Electronic Health Record System

Unit References
(All links accessible as of 3/12/2012)

Lecture 1a

*Indicates this link is no longer functional.


**Lecture 1a Charts, Tables, Figures**

1.1 Figure: MITRE. 2006 Electronic Health Data—Pre EHR Figure 1 Electronic Health Records Overview, http://www.ncrr.nih.gov/publications/informatics/EHR.pdf* Used with Permission.

1.2 Figure: MITRE. 2006 EHR Concept Overview Figure 2 Electronic Health Records Overview, http://www.ncrr.nih.gov/publications/informatics/EHR.pdf* Used with permission

1.3 Figure: Neal, Scott. 2011. Client Server Model. Used with Permission

*Indicates this link is no longer functional.

Health IT Workforce Curriculum  Installation and Maintenance of Health IT Systems Version 3.0/Spring 2012

This material was developed by Duke University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number IU24OC000024.
Lecture 1a Images
None used in this lecture.

Lecture 1b


Lecture 1b Charts, Tables, Figures
1.1 Table: Neal, Scott. EHR Hardware – Servers. Used with permission.

Lecture 1b Images
Slide 15: Laptop. Courtesy Scott Neal. Used with permission.
Slide 19: Local Area Network (LAN). Courtesy Scott Neal. Used with permission.

Unit Required Readings.
None for this unit.

Unit Suggested Readings

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**Student Application Activities**
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Component 8/Unit 2

Unit Title
System Selection – Software and Certification

Unit Description
This unit will discuss the differences in COTS (Commercial Off-The-Shelf) and in-house/homegrown systems and how to select the system to meet the needs of the end users. We will also look at the advantages of purchasing a CCHIT-certified system and discuss ARRA and “meaningful use” in the context of EHR systems. Lastly we will look at estimating the typical costs associated with EHR system startup.

Unit Objectives
By the end of this unit the student will be able to:
1. Compare and contrast COTS (Commercial Off-The-Shelf) and in-house/homegrown systems and describe their relative advantages and disadvantages.
2. Verify system compliance with ONC-ATCB certification.
3. Identify purpose and categories of ARRA “Meaningful Use” criteria.

Unit Topics / Lecture Titles
2 System Selection – Software and Certification

Unit References
(All links accessible as of 3/12/2012)

Lecture 2
1. About ARRA. Retrieved from HITECH Answers website: http://www.hitechanswers.net/about/about-arra/


*Indicates this link is no longer functional.


Lecture 2 Charts, Tables and Figures
None used in this lecture.

Lecture 2 Images
Slide 13: ARRA recovery.gov logo http://www.recovery.gov/News/mediakit/Picture%20Library/circle_recovery_logo.jpg*

Slide 13: Center for Medicare and Medicaid Services EHR Incentive Programs logo http://www.cms.gov/EHRIncentivePrograms/Downloads/EHRIncentiveLogoweb.JPG

Unit Required Readings
None for this unit.

Unit Suggested Readings


Student Application Activities
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comp8_unit2_activity_key.doc
comp8_unit2_self_assess.doc
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Component 8/Unit 3

Unit Title
System Selection – Functional and Technical Requirements

Unit Description
This unit will discuss the 12 different steps associated with system selection focusing on defining user functional requirements of systems and technical requirements (by the system), including how to the determine, document, prioritize, and act on those requirements through the use of case studies and other means.

Unit Objectives
By the end of this unit the student will be able to:
1. Identify 12 possible steps to choosing an EHR system
2. Gather functional requirements from institution and users
3. Document use-cases and relate them to functional requirements

Unit Topics / Lecture Titles
3 System Selection – Functional and Technical Requirements

Unit References
(All links accessible as 1/26/2012)

Lecture 3
6. Office of the National Coordinator (ONC) for Health Information Technology. How to Implement EHRs, Step 3: Select or Upgrade to a Certified EHR. Retrieved from http://www.healthit.gov/providers-professionals/step-3-select-or-upgrade-certified-ehr.*


Lecture 3 Charts, Tables, Figures

Lecture 3 Images
None in this lecture.

Unit Required Readings
None in this lecture.

Unit Suggested Readings
1. Should CCHIT Influence Your EHR Selection? By Don Fornes http://www.softwareadvice.com/articles/medical/should-cchit-influence-your-ehr-selection/ An excellent overview of CCHIT’s role in EHR selection and the criteria certified by the organization.


Student Application Activities
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Component 8/Unit 4

Unit Title
Structured Systems Analysis and Design

Unit Description
This unit will discuss the basics of developing a project plan and the role of a project manager.

Unit Objectives
By the end of this unit the student will be able to:
1. Identify the 8 basic components to a project plan
2. Define the role of a project manager
3. Equate the basic project plan components to a typical EHR implementation plan
4. Create a project plan for system design and implementation

Unit Topics / Lecture Titles
4 Structured Systems Analysis and Design

Unit References
(All links accessible as of 2/15/2012)

Lecture 4
- Hohly, Marge. Project Plan Definition[Internet]. 2007. [Cited July 2010]: [about 5 screens]. http://www.cerritos.edu/hohly/WorkExperience/project_plan_instructions.htm

*Indicates this link is no longer functional.
Lecture 4 Charts, Tables, Figures
None used in this lecture.

Lecture 4 Images
Slide 5 : The Project Diamond. Courtesy Scott Neal. Used with permission.
Slide 7 : The Role of a Project Manager. Courtesy Scott Neal. Used with permission.

Unit Required Readings
None used in this lecture.

Unit Suggested Readings
2. “EHR Implementation Roadmap: 2005 Pilot” 2005 http://hosted-docs.ittoolbox.com/AS030504.pdf. This is an EHR Implementation plan template students may use as a guide to developing their own plans for the activities.

Student Application Activities
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Component 8/Unit 5

Unit Title
Software Development Life Cycle

Unit Description
This unit introduces the student to the SDLC model and explores its application to well-known software and its utility for healthcare IT systems.

Unit Objectives
By the end of this unit the student will be able to:
1. Define the steps of the Software Development Life Cycle, or SDLC, and the purpose and importance of each.
2. Describe different models of the SDLC and their key differences.
3. Describe how and why an HIT software application would go through the SDLC.

Unit Topics / Lecture Titles
5 Software Development Life Cycle

Unit References
(All links accessible as of 1/26/2012)

Lecture 5

Lecture 1b Charts, Tables, Figures
None in this lecture.

Lecture 1b Images
Slide 6: Waterfall model of SDLC. Image courtesy of Scott Neal.
Slide 7: Iterative model of SDLC. Image courtesy of Scott Neal.
Slide 20: Waterfall model of SDLC. Image courtesy of Scott Neal.
Slide 23: Iterative model of SDLC. Image courtesy of Scott Neal.
Slide 24: Spiral model of SDLC. Image courtesy of Scott Neal.

*Indicates this link is no longer functional.
Unit Required Readings
None in this lecture.

Unit Suggested Readings
4. Quick Study: Systems Development Life Cycle.” By Russel Kay (also available in podcast from the website.) [http://www.computerworld.com/s/article/71151/System_Development_Life_Cycle?taxonomyId=011](http://www.computerworld.com/s/article/71151/System_Development_Life_Cycle?taxonomyId=011) Another introduction to SDLC, the waterfall model, and the spiral model. The next text, which may be behind a “paywall” or not easily accessible, since it is suggested.

Student Application Activities
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Component 8/Unit 6

Unit Title
System Security Procedures and Standards

Unit Description
This unit includes Federal State and local health information regulations for EHRs, computer and network system vulnerabilities and best practices for identification and mitigation of those vulnerabilities, information access and protection measures, and user security training.

Unit Objectives
By the end of this unit the student will be able to:
1. Identify regulatory requirements for EHRs
2. Provide training for system users regarding the methods and importance of security compliance
3. Identify administrative, physical, and technical safeguards for system security and regulatory compliance
4. Identify best practices for system security
5. Identify best practices for risk / contingency management

Unit Topics / Lecture Titles
6  System Security Procedures and Standards

Unit References
(All links accessible as of 1/31/2012)

Lecture 6a

*Indicates this link is no longer functional.


**Lecture 6a Charts, Tables, Figures**

None in this lecture.

**Lecture 6a Images**

None in this lecture.

**Lecture 6b**


Lecture 6b Charts, Tables, Figures
None in this lecture.

Lecture 6b Images
Slide 8: VPN example, 2012. Provided by Scott Neal
Slide 10: Firewall example, 2012. Provided by Scott and Nolan Neal

Unit Required Readings
None in this lecture.

Unit Suggested Readings


Student Application Activities
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comp8_unit6_self_assess.doc
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Component 8/Unit 7

Unit Title
System Interfaces and Integration

Unit Description
This unit explores the issues and challenges involved in interfacing and integrating systems including understanding system requirements and the messaging and other techniques used between various systems.

Unit Objectives
By the end of this unit the student will be able to:
1. Determine and document system interfaces and integration requirements
2. Describe the pitfalls associated with installing a new application in an environment of pre-existing applications
3. Give examples of interfacing modalities

Unit Topics / Lecture Titles
7 System Interfaces and Integration

Unit References
(All links accessible as of 2/15/2012)

Lecture 7

*Indicates this link is no longer functional.

Lecture 7 Charts, Tables, Figures
7.1 Table. Neal, S., 2012.

Lecture 7 Images
Slide 6: Illustrations of point-to-point & interface engine. Images courtesy of Scott Neal.
Slide 18: HL7 interface engine. Image courtesy of Scott Neal.
Slide 21: Point-to-point EHR interface. Image courtesy of Scott Neal.
Slide 22: Point-to-point vs. HIE EHR interfaces. Image courtesy of Scott Neal.

Unit Required Readings
None in this lecture.

Unit Suggested Readings
1. “HL7 Messages” By Gunther Schadow. [Internet], Revised 1996, http://aurora.regenstrief.org/~gunther/oldhtml/messages.html This is a reference guide for deciphering HL7 2X messages
2. “HL7 International.” [Internet], Revised 2010, http://www.hl7.org/ This is the official HL7 website which highlights HL7, discusses HL7 as a standard and outlines the organization’s goals and achievements.
3. Interfaceware’s website at: http://www.interfaceware.com/hl-7.html This site provides users with an excellent launching point for understanding the HL7 standard

Student Application Activities
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Component 8/Unit 8

Unit Title
Troubleshooting, Maintenance and Upgrades, and Interaction with Vendors, Developers, and Users

Unit Description
This Unit explores aspects of setting up a robust support structure for troubleshooting and maintaining the system, including developing troubleshooting and escalation procedures, measuring system performance, and communication with vendors (or local developers).

Unit Objectives
By the end of this unit the student will be able to:
1. Identify and implement an effective troubleshooting procedure for reporting, evaluating, fixing, deploying, and follow-up of errors, problems, or limitations for the system
2. Integrate downtime schedule for OS, network, database, and client application maintenance and updates

Unit Topics / Lecture Titles
8 Troubleshooting, Maintenance and Upgrades, and Interaction with Vendors, Developers, and Users

Unit References
(All links accessible as of 1/15/2012)

Lecture 8a

*Indicates this link is no longer functional.


Lecture 8a Charts, Tables, Figures
None in this lecture.

Lecture 8a Images
Slide 8: “EHR Troubleshooting Workflow” by Scott Neal. Used with Permission

Lecture 8b


*Indicates this link is no longer functional.
Lecture 8b Charts, Tables, Figures
None in this lecture.

Lecture 8b Images
None in this lecture.

Unit Required Readings
None in this lecture.

Unit Suggested Readings

Student Application Activities
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comp8_unit8_activity_key.doc
comp8_unit8_self_assess.doc
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Component 8/Unit 9

Unit Title
Creating Fault Tolerant Systems, Backups, and Decommissioning

Unit Description
Unit description goes here.

Unit Objectives
By the end of this unit the student will be able to:

1. Define availability, reliability, redundancy, and fault tolerance
2. Explain areas and outline rules for implementing fault tolerant systems
3. Perform risk assessment
4. Follow best practice guidelines for common implementations
5. Develop strategies for backup and restore of operating systems, applications, configuration settings, and databases and
6. Decommission systems and data

Unit Topics / Lecture Titles
9a1. Creating Fault Tolerant Systems, Backups, and Decommissioning
9a2. Creating Fault-Tolerant Systems, Backups, and Decommissioning
9a3. Creating Fault-Tolerant Systems, Backups, and Decommissioning

Unit References
(All links accessible as of 2/17/2012 (9a) and 2/17/2012 (9b))

Lecture 9a

*Indicates this link is no longer functional.


Acknowledgement: The following reference generally informed the unit


Lecture 9a Charts, Tables, Figures
None in this lecture.

Lecture 9a Images
None in this lecture.

Lecture 9b


Acknowledgement: The following reference generally informed the unit


Lecture 9b Charts, Tables, Figures
None in this lecture.
Lecture 9b Images

Lecture 9c
Practice Brief-Retention of Health Information (updated) - Table 4: State Laws or Regulations Pertaining to Retention of Health Information. (n.d.). Retrieved February 8, 2012, from AHIMA website: http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_012547.pdf*

Lecture 9c Charts, Tables, Figures
None in this lecture.

Lecture 9c Images
None in this lecture.

Unit Required Readings
None in this lecture.

Unit Suggested Readings

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Student Application Activities
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comp8_unit9_activity_key.doc
comp8_unit9_self_assess.doc
comp8_unit9_self_assess_key.doc
Component 8/Unit 10

Unit Title
Developing a Test Strategy and a Test Plan

Unit Description
This Unit explores aspects of testing the system, including the use of performance baselines and the role of test plans.

Unit Objectives
By the end of this unit the student will be able to:
1. Gather user feedback and performance baseline for system validation and testing
2. Document problems with their resolution status
3. Create, execute, and document a test plan

Unit Topics / Lecture Titles
10 Developing a Test Strategy and a Test Plan

Unit References
(All links accessible as of 2/27/2012)

Lecture 10
Lecture 10 Charts, Tables, Figures

Lecture 10 Images
None in this lecture.

Unit Required Readings
None in this lecture.

Unit Suggested Readings
1. “Testing: Test Plan development” by Craig Borysowich. February 2005; [Internet]. http://it.toolbox.com/blogs/enterprise-solutions/testing-test-plan-development-step-1-2923 This online resource outlines the 10 steps to developing a test plan…from assembling the team to analyzing the reports.

*Indicates this link is no longer functional.

3. “What is User Acceptance Testing?.” By Exforsys. [Internet]. http://www.exforsys.com/tutorials/testing/what-is-user-acceptance-testing.html This article defines user testing and discusses each of the fundamental tasks.


5. “User Acceptance Test Plan.” By University of Minnesota. [Internet]. www.uservices.umn.edu/pmo/docs/Test/TEMPLATE_UAT_Plan.doc* This is a sample test plan template.

**Student Application Activities**
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comp8_unit10_activity_key.doc
comp8_unit10_self_assess.doc
comp8_unit10_self_assess_key.doc
Component 8/Unit 11

Unit Title
Pilot Testing and Full-Scale Deployment

Unit Description
This Unit explores aspects of deploying the system to end users, including communication, technical support, user feedback, and system resource evaluation including initial pilot testing to obtain feedback before full deployment, including planning, identifying the user group, setting up the system, and gathering feedback.

Unit Objectives
By the end of this unit the student will be able to:
1. Identify pilot testing, deployment steps, and group for pilot testing
2. Develop a plan for training pilot users
3. Gather and prioritize feedback from pilot test
4. Recommend amount of legacy data to preload
5. Develop a plan for implementation using best practices
6. Identify post-implementation practices

Unit Topics / Lecture Titles
11 Pilot Testing and Full-Scale Deployment

Unit References
(All links accessible as of 2/10/2012)

Lecture 11

*Indicates this link is no longer functional.


**Lecture 11 Charts, Tables, Figures**

None in this lecture.

**Lecture 11 Images**

None in this lecture.

**Unit Required Readings**

None in this lecture.

**Unit Suggested Readings**


Student Application Activities
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comp8_unit11_activity_key.doc
comp8_unit11_self_assess.doc
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*Indicates this link is no longer functional.
Component Acronym Glossary
DCHI Acronym Guide (January 2011)

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<th>Acronym</th>
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<td>American Board of Internal Medicine</td>
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<td>Access Control Lists</td>
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<td>Association for Computing Machinery</td>
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<td>BRIDG</td>
<td>Biomedical Research Integrated Domain Group</td>
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<tr>
<td>BSA</td>
<td>Body Surface Area</td>
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*Indicates this link is no longer functional.
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<tr>
<td>BSLM</td>
<td>Bioinformatic Sequence Markup Language</td>
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<tr>
<td>CA</td>
<td>Certificate Authority</td>
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<td>CaDSR</td>
<td>Cancer Data Standard Repository</td>
</tr>
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<td>CAP</td>
<td>College of American Pathologists</td>
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<td>CBA</td>
<td>Cabarrus Health Alliance</td>
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<tr>
<td>CCD</td>
<td>Continuity of Care Document</td>
</tr>
<tr>
<td>CCHIT</td>
<td>Certification Commission for Healthcare Information Technology</td>
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<td>CCOW</td>
<td>Clinical Context Object Workgroup (HL7)</td>
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<tr>
<td>CDA</td>
<td>Clinical Document Architecture</td>
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<td>CDASH</td>
<td>Clinical Data Acquisition Standards Harmonization</td>
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<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
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<td>CDE</td>
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<td>Clinical Data Interchange Standards Consortium</td>
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<td>Chronic Disease Management</td>
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<td>Clinical Decision Support</td>
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<td>CDSR</td>
<td>Cochrane Database of Systematic Reviews</td>
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<td>CDSS</td>
<td>Clinical Decision Support System</td>
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<td>CG</td>
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<td>Context Inspired Component Architecture</td>
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<td>CMMI</td>
<td>Capability Maturity Model Integration</td>
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<td>Centers for Medicare and Medicaid Services</td>
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<td>Common Product Model</td>
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<td>Computerized Provider Order Entry</td>
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<td>CQI</td>
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<tr>
<td>CRL</td>
<td>Certificate Revocation List</td>
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<td>Cathode Ray Tube</td>
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<td>CSI</td>
<td>Computable Semantic Interoperability</td>
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<td>CSMA/CA</td>
<td>Carrier Sense Multiple Access/Collision Avoidance</td>
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<td>Computed Tomography</td>
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<td>CTA</td>
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<td>Domain Analysis Model</td>
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<td>DFDs</td>
<td>Data Flow Diagrams</td>
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<td>DHCP</td>
<td>Dynamic Host Configuration Protocol</td>
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<td>Department of Health and Human Services</td>
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<td>DICOM</td>
<td>Digital Imaging and Communications in Medicine</td>
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<tr>
<td>DMAIC</td>
<td>Define, Measure, Analyze, Improve, Control</td>
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<td>DMIM</td>
<td>Domain Message Information Model</td>
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<td>DNS</td>
<td>Domain Name Service</td>
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<td>Department of Defense</td>
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<td>DoS</td>
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<td>Diagnosis-related Group</td>
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<td>DSL</td>
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<td>Decision Support System</td>
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<td>DSTU</td>
<td>Draft Standard for Trial Use</td>
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<td>DTD</td>
<td>Document Type Definition</td>
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<td>Data Use and Reciprocal Support Agreement</td>
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<td>Electronic Data Interchange</td>
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<td>EDMS</td>
<td>Electronic Document Management System</td>
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<td>Electroencephalogram</td>
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<td>Electronic Health Records</td>
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<td>eMAR</td>
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<td>European Medicines Agency</td>
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<td>eMR</td>
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<td>EMR</td>
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<td>EMR/PM</td>
<td>Electronic Protected Health Information</td>
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<td>ePHI</td>
<td>Enterprise Master Patient Index</td>
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<td>EPPI</td>
<td>Electronic Prescribing</td>
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<td>Fiber Data Distributed Interface</td>
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<td>Family Educational Rights and Privacy Act</td>
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<td>FM</td>
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<td>Failure Mode and Effects Analysis</td>
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<td>File Transfer Protocol</td>
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<td>Federally Qualified Health Center</td>
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<td>GDSN</td>
<td>Global Data Synchronisation Network</td>
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<td>GELLO</td>
<td>an object-oriented expression language for clinical decision support</td>
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<td>GEM</td>
<td>Guideline Elements Model</td>
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<td>GIN</td>
<td>Generic Incident Notification</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<td>GLIF</td>
<td>GuideLine Interchange Format</td>
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<td>HCD</td>
<td>Human Centered Design</td>
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<td>Health Care Information System</td>
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<td>HDC</td>
<td>Health Disparities Collaborative</td>
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<td>HDF</td>
<td>Hierarchical Data Format</td>
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<td>Health Information and Management Systems Society</td>
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<td>HIS</td>
<td>Health Information System or Hospital Information Systems</td>
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<td>HISPC</td>
<td>Health Information Security and Privacy Collaboration</td>
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<td>Health Information Technology</td>
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<td>Health Information Technology for Economic and Clinical Health</td>
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<td>HITSC</td>
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<tr>
<td>HITSP</td>
<td>Health Information Technology Standards Panel</td>
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<td>Health Level Seven</td>
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<td>HMD</td>
<td>Hierarchical Message Descriptions</td>
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<td>HRSA</td>
<td>Health Resources and Services Administration</td>
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</table>
HSSP  Healthcare Services Specification Project
HTTP  Hypertext Transfer Protocol
HW  Hardware
Hz  Hertz
IANA  Internet Assigned Numbers Authority
ICD  International Classification of Diseases
ICD-10-CM  International Classification of Diseases, 10th Revision, Clinical Modification
ICH  International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use
ICMP  Internet Control Message Protocol
ICPC  International Classification of Primary Care
ICSR  Individual Case Safety Report
ICT  Information and Communication Technologies
ICU  Intensive Care Unit
IDS  Intrusion Detection System
IE  Internet Explorer
IEC  International Electrotechnical Commission
IEEE  Institute of Electrical and Electronics Engineers
IETF  Internet Engineering Task Force
IG  Implementation Guide (HL7)
IHE  Integrating the Healthcare Enterprise
IHS  Indian Health Services
IHTSDO  International Health Terminology Standards Development Organisation
IIS  Internet Information Services
INR  International Normalized Ratio
IOM  Institute of Medicine
IP  Internet Protocol
IP/OP  Inpatient/Outpatient
IS  Information System
ISDN  Integrated Services Digital Network
ISO  International Organization for Standardization
ISO/TC  International Organization for Standardization’s (ISO) Technical Committee (TC) on health informatics
IT  Information Technology
ITS  Implementable Technology Specifications (HL7)
JIC  Joint Initiative Council
LAB  Laboratory Data Model
<table>
<thead>
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<td>LAN</td>
<td>Local Area Network</td>
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<tr>
<td>LDAP</td>
<td>Lightweight Directory Access Protocol</td>
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<tr>
<td>Leapfrog Group</td>
<td>Consortium of major companies and other large private and public healthcare purchasers</td>
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<td>LIMS</td>
<td>Lab Information Management System</td>
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<tr>
<td>LLC</td>
<td>Logical Link Control</td>
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<tr>
<td>LOINC</td>
<td>Logical Observation Identifiers Names and Codes</td>
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<tr>
<td>MAC</td>
<td>Mandatory Access Control</td>
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<td>MAR</td>
<td>Medication Administration Record</td>
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<td>MD</td>
<td>Medical Doctor</td>
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<td>MDA</td>
<td>Model Driven Architecture</td>
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<td>MDE</td>
<td>Master Data Element</td>
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<td>MDF</td>
<td>Methodology Development Framework</td>
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<td>MDM</td>
<td>Master Data Management</td>
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<td>MEDCIN</td>
<td>System of standardized medical terminology developed by Medicomp Systems</td>
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<td>MedDRA</td>
<td>Medical Dictionary for Regulatory Activities</td>
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<td>MICR</td>
<td>Multipurpose Internet Mail Extensions</td>
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<td>Magnetic Ink Character Recognition</td>
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<td>Management Information System</td>
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<td>MLM</td>
<td>Medical Logic Module</td>
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<td>MLLP</td>
<td>Minimal Lower Layer Protocol</td>
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<td>Modifiable Off-the-Shelf</td>
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<td>MPI</td>
<td>Master Patient Index</td>
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<td>MSH</td>
<td>Message Header Segment</td>
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<td>MU</td>
<td>Meaningful Use</td>
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<td>National Alliance for Health Information Technology</td>
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<td>Network Address Translation</td>
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<td>National Council for Prescription Drug Programs</td>
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<td>National Cancer Institute</td>
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<td>NDF</td>
<td>National Drug File</td>
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<td>NDF-RT</td>
<td>National Drug File-Reference Terminology</td>
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<td>NEMA</td>
<td>National Electrical Manufacturers Association</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>NEDSS</td>
<td>National Electronic Disease Surveillance System</td>
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<td>NETSS</td>
<td>National Electronic Telecommunications System for Surveillance</td>
</tr>
<tr>
<td>NetBUI</td>
<td>NetBios Extended User Interface</td>
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<td>National Guideline Clearinghouse</td>
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<td>National Health Information Management Group</td>
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<td>Network Interface Cards</td>
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<td>NIST-ATL</td>
<td>National Institute for Standards and Technology-Advanced Technology Laboratories</td>
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<td>NHIN</td>
<td>Nationwide Health Information Network</td>
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<td>Network Load Balancing</td>
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<td>National Library of Medicine</td>
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<td>National Provider Identifier</td>
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<td>NRZ</td>
<td>Non Return to Zero</td>
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<td>NTFS</td>
<td>New Technology File System</td>
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<td>National Quality Forum</td>
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<td>OASIS</td>
<td>Organization for the Advancement of Structured Information Standards</td>
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<tr>
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<td>Office of Care Coordination</td>
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<td>Object Constraint Language</td>
</tr>
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<td>OCR</td>
<td>Office of Civil Rights</td>
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<td>ODM</td>
<td>Operational Data Model or Optical Character Recognition</td>
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<td>OID</td>
<td>Object Identifier</td>
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<tr>
<td>OLAP</td>
<td>Online Analytical Processing</td>
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<td>Object Management Group</td>
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<td>Office of the National Coordinator Authorized Testing and Certification Body</td>
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<tr>
<td>OOD</td>
<td>Operating Room</td>
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<tr>
<td>OR</td>
<td>Object Oriented Design</td>
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<td>OS</td>
<td>Operating System</td>
</tr>
<tr>
<td>OSI</td>
<td>Open Systems Interconnection</td>
</tr>
<tr>
<td>OTP</td>
<td>One-Time Passwords</td>
</tr>
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<td>OUI</td>
<td>Organizational Unique Identifier</td>
</tr>
<tr>
<td>OWL</td>
<td>Web Ontology Language</td>
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<td>PACS</td>
<td>Picture Archiving and Communication Systems</td>
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</table>
RIS Radiology Information Systems
RMIM Refined Message Information Model
RMPI Registry Master Patient Index
ROI Return On Investment
RPM Remote Patient Monitoring
RPS Regulated Product Submission
RSNA Radiological Society of North America
RX Prescription
SAEAF Services-Aware Enterprise Architecture Framework
SAIF Services Aware Interoperability Framework
SAN Storage Area Network
SATA Serial Advanced Technology Attachment
SCO SDO Charter Organization
SCSI Small Computer System Interface
SDLC Software Development Life Cycle
SDM Systems Development Method
SDO Standard Development Organization
SDTM Study Data Tabulation Model
SEI Subject Matter Expert
SME Software Engineering Institute
SMTP Simple Mail Transport Protocol
SNOMED Systematized Nomenclature of Medicine
SNOMED CT Systematized Nomenclature of Medicine--Clinical Terms
SNOMED RT Systematized Nomenclature of Medicine--Reference Terminology
SNOP Systematized Nomenclature of Pathology
SOA Service Oriented Architecture
SOAP Simple Object Application Protocol
SOP Structured Product Labeling
SPC Statistical Process Control
SPL Standard Operating Procedure
SSA Social Security Administration
SSID Service Set Identifier
SSL Secure Socket Layer
SSN Social Security Number
SSO Single Sign-On
STP Shielded Twisted-Pair
TCP/IP Transmission Control Protocol / Internet Protocol
TEPR Toward an Electronic Patient Record Conference
<table>
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<th>Abbreviation</th>
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<td>Transport Layer Security</td>
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<tr>
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<td>Table of Contents</td>
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<tr>
<td>TP</td>
<td>Twisted-Pair</td>
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<tr>
<td>TPS</td>
<td>Transaction Processing System</td>
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<td>TSC</td>
<td>HL7 Technical Steering Committee</td>
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<tr>
<td>TTL</td>
<td>Time to Live</td>
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<tr>
<td>UAT</td>
<td>User Acceptance Testing</td>
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<td>UDP</td>
<td>User Datagram Protocol</td>
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<td>Uniform Modeling Language</td>
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<td>Unified Medical Language System</td>
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<td>URLs</td>
<td>Universal Resources Locators</td>
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<td>Unique Patient Identifier</td>
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<td>UPS</td>
<td>Un-interrupted power supply</td>
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<td>US</td>
<td>Ultrasound</td>
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<td>Universal Serial Bus</td>
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<td>U.S. Technical Advisory Group</td>
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<td>Unshielded Twisted-Pair</td>
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<td>Veterans Administration National Drug File-Reference Terminology</td>
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<td>Virtual Medical Record</td>
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<td>Voluntary Universal Healthcare Identification System</td>
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<td>Vanderbilt University Medical Center</td>
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<td>W3C</td>
<td>World Wide Web Consortium</td>
</tr>
<tr>
<td>WAN</td>
<td>Wide Area Network</td>
</tr>
<tr>
<td>WAP</td>
<td>Wireless Access Point</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WLAN</td>
<td>Wireless Local Area Network</td>
</tr>
<tr>
<td>WONCA</td>
<td>World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians. (World Organization of Family Doctors)</td>
</tr>
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<td>Web Services Description Language</td>
</tr>
<tr>
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<td>World Wide Web</td>
</tr>
<tr>
<td>XDR</td>
<td>External Data Representation</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
</tr>
</tbody>
</table>
Appendix 1: Sunny Happy Care Family Practice Scenario

Activities have been created throughout this component referencing Sunny Happy Care to provide a more relevant and consistent experience for the student. The example was intentionally written to provide flexibility for the instructor, who can tailor the example to best meet the specific needs for the component.

The Sunny Happy Care documentation includes:

- An introductory lecture outlining Sunny Happy Care Family Practice (SHCFP)
- Notes and guidelines for using SHCFP documents
- Floor Plans for SHCFP, one with networking ports, one without.
- These documents can be found in the zip with file name: comp8_SHC_scenario.zip