Healthcare IT in a Nutshell

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get computer-literate and learn Healthcare IT in just a few hours: read/click on the links online at isedis.com

Terms to learn:

.: Star-Dot-Star (any file name, any file extension)

.$$$: Temporary File

3G: "Third-Generation" cellular services: broadband over cellphones and cellphone modems ("Aircards")

ADSL: Asymmetric Digital Subscriber Line (commonest form of broadband over phone lines)

AFAIK: As Far As I Know (email)

AGP: Accelerated/Advanced Graphics Port

AHIC: American Health Information Community www.hhs.gov/healthit/community/background/ Major healthcare IT organization.

AJAX: Asynchronous JavaScript and XML (e.g., the technology behind Google Maps)

AMD: (1) Active Matrix Display; (2) Advanced Micro Devices, Inc.

ANSI: American National Standards Institute

Architecture: the structure of an information system and how its pieces communicate and work together. Also see client/server.

.ASC: ASCII text

ASCII: American Standard Code for Information Interchange ***The*** standard for simple text files. Pronounced "ass'-key."

.ASM: Assembler Source Language

.ASP: Active Server Page (file name extension)

ASP: (1) Association of Shareware Professionals (2) An Application Service Provider deploys, hosts, and manages access to software applications for multiple parties from a central facility. The ASP charges a subscription fee to users of the applications, which are delivered over the Internet or other public or private networks.

ATA: Advanced Technology Attachment (original hard drive interface)

ATM: (1) Adobe Typeface Manager ; (2) Asynchronous Transfer Mode

Autoexec: Automatic Execution file (AUTOEXEC.BAT automatically executed on startup of DOS systems)

B2B: Business to Business

.BAK: Backup

Bandwidth: bandwidth is how much information can be transmitted at once through a communication medium, such as a telephone line, fiber-optic cable, or radio frequency.

.BAS: Basic Language (N.B. Niklaus Wirth insisted that anyone who learned to program in BASIC was irretrievably brain-damaged.)

.BAT: Batch file

Beaming: Transfer of data or software programs between devices, such as PDAs, personal computers and printers, using either infrared or radio-wave transmission.

Biometric Authentication: Technology that identifies a person through recognition of unique physical characteristics, such as retina or iris patterns, face shape, voice patterns or fingerprints.

.BIN: Binary

BIOS: Basic Input/Output System (system chips)

Bit: The undivisible elementary particle of classical digital data. A bit is either on (1) or off (0). If someone starts talking about how this is not really true for quantum computing just ignore them. As Bacon observed: *we are more likely to reach the truth through error than through confusion*.

Bluetooth: A protocol designed for short-range wireless communication or networking among a variety of devices. Somewhat similar to, but distinct from, 802.11x (WiFi).

.BMP: Bitmap Picture

BPS: (1) Bits Per Second; (2) Bytes Per Second

Broadband: A medium that can carry multiple signals, or channels of information, at the same time without interference. Broadband Internet connections enable high-resolution videoconferencing and other applications that require rapid, synchronous exchange of data. WiFi, cable modem, satellite, WiFi and EVDO/3G cellular laptop modems are examples.

Browser: A software program that renders (shows) documents written in HTML, the primary programming language of the World Wide Web. Common browsers include Firefox, Safari, Opera, Chrome and Microsoft Internet Explorer, all of which render HTML with slight differences.

BsoD: Blue (or black) Screen of Death: Windows just died (again)

Byte: eight bits.

CCHIT: Certification Commission for Healthcare Information Technology. cchit.org Major healthcare IT organization.

C/C++/C#: C is an established programming language found in many operating systems, including UNIX. C++ and C# are popular descendants of C that incorporate object-oriented features. Also see Java.

CAD: Computer Aided Design

CAPTCHA: A Completely Automatic Public Turing Test To Tell Computers and Humans Apart Requiring users to read and input semi-illegible text is a common method.

CAT5: computer network cable

CC: Carbon Copy (email)

CD-R: Compact Disk - Recordable

CD-R/W: Compact Disk - Rewritable

CD-ROM: Compact Disk - Read Only Memory

CDMA: Code-Division Multiple Access (wireless/cellphone protocol)

CDPD: Cellular Digital Packet Data (wireless protocol)

CERT: Computer Emergency Response Team

.CFG: Configuration

.CGM: Computer Graphics Metafile

Charting Software: "Charting" is the common term for physician and nurse clinical documentation. Charting software can be "structured" or unstructured.

Structured charting requires physicians and nurses to choose items from predefined lists, usually in a very deeply-nested hierarchical menu. This may be done by mouse or touchscreen ("point and click") or by typing the first part of each menu selection and pressing Enter ("type and click"). For example, one would click on menu options such as: Physical Exam > HEENT > Throat > Injected, then click on Physical Exam > neck > lymph nodes > anterior adenopathy… Structured charting provides structured data which can be quite valuable for research and administration.

For relatively simple repetitive charting, structured charting can be reasonably efficient. This is likely why most ED nurses (unlike most ED docs) find structured charting acceptable.

However, for more complex and less repetitive tasks, such as emergency physician charting, structured charting is much less efficient. Structured physician charting is extremely expensive, given the hourly cost of physician time ("physicians are expensive data-entry clerks").

Structured charting provides reminders to include items, such as pertinent negatives or things that are routinely done but sometimes forgotten when charting. For example: that the fontanel is normal in pediatric examinations; or, that thrombolytics were considered but not thought appropriate for a patient with a stroke. This is important for risk management/legal reasons, and for billing.

Unstructured charting, such as dictating into a telephone, can be parsed to create structured data, even in realtime (for example, analyzing a physician's ED note for compliance with the required number of Review of Systems and Physical Exam items for billing) but this has not been widely used. The traditional model is to send such dictations for typing by trancriptionists. Speech-recognition software is used on the dictation and only then the transcriptionist corrects speech-recognition errors. As speech-recognition continues to improve, ***self-edit mode*** is becoming more common: the dictation appears on the physician's computer screen and is edited as it is dictated. This takes some physician time, but charts are complete and signed soon after the patient encounter.

A hybrid approach uses speech-recognition for structured-charting free-text areas instead of typing. (The History of Present Illness and Medical Decision-Making sections are particularly suited for this.) Many niche EDIS vendors offer this.

Another hybrid approach is to use speech as the primary input mode, but allowing physicians to navigate structured templates by voice, which is by accounts faster than the above hybrid method, but does not produce structured data. Nuance (previously Dictaphone) offers Powerscribe emergency medicine – though it has not been significantly improved in several years – and Enterprise Workstation, which is their flagship product for self-editing.

.CHK: CHKDSK is a DOS/Windows utility that CHecKs the hard DiSK and attempts to save data after a software or hardware "crash"; it may produce .CHK files with at least some of the lost data.

EMR vs. EHR vs. PHR?

Many people use the terms *electronic medical record* (EMR), *electronic health record* (EHR) and *personal health record* (PHR) interchangeably. But arguably they mean very different things.

There are also a great variety of other terms used to describe electronic records, but **EMR** and **AHR** and **PHR** are now more-or-less accepted as the three real terms. In fact, the US ONCHIT commissioned the NAHIT to develop definitions and so, at least in the USA, these are official. You might want to refer to the schematic below.

An EMR is just that – an electronic record of an episode of medical care, whether inpatient or outpatient or ED. The EHR is both more and less than the EMR – it is those parts of the EMR that are appropriately shared with stakeholders outside the hospital, doctor's office or other EMR source. Parts of the EMR are shared, as the EHR insurance companies, government agencies, patients themselves, and employers. An article in Medical Economics, quoting an Institute of Medicine report, defines the elements of an EHR thusly:

- **Health information and data.** The system holds what's normally in a paper chart – problem lists, medication lists, test results.
- **Results management.** An EHR lets you receive lab results, radiology reports, and even X-ray images electronically.
- **Order entry.** No more prescription pads. All your orders are automated.
- **Decision support.** An EHR is smart enough to warn you about drug interactions, help you make a diagnosis, and point you to evidence-based guidelines when you ponder treatment options.
- **Electronic communications and connectivity.** You can talk in cyberspace with patients, your medical assistant, referring doctors, hospitals, and insurers—securely. And your system interfaces with everyone else's. Interoperability is the key word.
- **Patient support.** Patients can receive educational material via the EHR and enter data themselves through online questionnaires and home monitoring devices.
- **Administrative processes.** The system lends a hand with practice management. Patients can schedule their own appointments and staffers can check on insurance eligibility.
- **Reporting and population health management.** How many patients did you treat for tuberculosis in 2003? How many of your diabetics have their HbA1c under 7? An EHR will spit out the answers, thanks to a searchable database.

A Personal Health Record is just that: ***personal***. It is those parts of the EMR/EHR that an individual person "owns" and controls. Google and Microsoft want to help you with this. (Really.)

If these definitions seem a bit vague, well, yes, they are, because we're just getting started with this stuff, you know?

NAHIT defines the following:

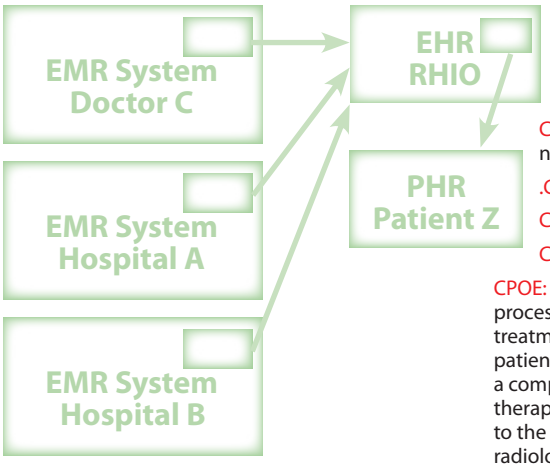
Electronic Medical Record (EMR): An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.

Electronic Health Record (EHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.

Personal Health Record (PHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.

Regional Health Information Organization (RHIO): A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.

EMR adoption by hospitals, which is a prerequisite for EHRs and PHRs is rated on a 0-7 scale, with 0 being no EMR and 7 being a full, totally paperless EMR. On this scale, about 20% of hospitals are at Stage 0, 20% at Stage 1, 50% at Stage 2, and 10% at Stage 3. None are at Stage 7 (HIMSS data).



CIO: Chief Information Officer

CGI-BIN: Common Gateway Interface – Binary (programming for Web forms)

Client: In a computer network, a workstation that retrieves information from a server.

Client/server: A network system in which a dedicated computer (server) handles some data storage and processing tasks for applications used on personal computers or workstations (clients, which are usually a PC), which tap the server's shared files and processing power as needed. Thin clients are basically "dumb terminals" and leave all the work to the server. Thick clients do a fair bit of work on the workstation.

CMOS: (1) Complementary Metal-Oxide Semiconductor (type of nonvolatile memory chip); (2) PC configuration stored on CMOS

CMYK: Cyan-Magenta-Yellow-Black (color model)

COAX: Coaxial Cable (for Ethernet and similar networks)

.COM: Command

COM1: First serial Port (asynchronous port)

COM2: Second serial Port

CPOE: Computerized Provider Order Entry is a process of electronic entry of instructions for the treatment of patients (particularly hospitalized patients). These orders are communicated over a computer network to the medical staff (nurses, therapists, pharmacists, or other physicians) or to the departments (pharmacy, laboratory or radiology) responsible for fulfilling the order. The CPOE system may compare the order against standards for dosing, may check for allergies or interactions with other medications, and may warn the practitioner about potential problems. CPOE systems designed with good user interaction may decrease delay in order completion, reduce errors related to handwriting or transcription, allow order entry at point-of-care or off-site, provide error-checking for duplicate or incorrect doses or tests, and simplify inventory and posting of charges. However, many CPOE systems with poorly-designed user interfaces have introduced major new sources of error and have been deinstalled or replaced with somewhat-better versions. See usability guru Jakob Nielsen's article Medical Usability: How to Kill Patients Through Bad Design.

CPU: Central Processing Unit

CRT: Cathode Ray Tube: standard type computer monitor display

CSID: Call Subscriber ID (for FAX and phone caller ID)

CSLIP: Compressed Serial Line Interface Protocol [Internet]

CSV: Comma-Separated Value/Variable (file type)

CTRL: Control (computer keyboard key)

.DAT: Data file

Data Dictionary: A list that describes the specifications and locations of all data contained in a system.

Data Mining: Analyzing information in a database using tools that look for trends or anomalies without knowledge of the data's meaning. Mining a clinical database may produce new insights on outcomes, alternate treatments, or effects of treatment on different races and genders.

Data Repository: A database acting as an information storage facility. Although often used synonymously with data warehouse, a repository does not have the analysis or querying capabilities of a warehouse.

Data Warehouse: A large database that stores information like a data repository but goes a step further, allowing users to access data to perform research-oriented analysis.

Database Server: A computer that stores data centrally for network users. It often uses client/server software to distribute the processing of data among itself and other workstations on the network.

dB: Decibel

DBMS: Data Base Management System See relational database.

DDE: (1) Direct Data Entry; (2) Dynamic Data Exchange [Microsoft: method to exchange data between programs]

Decision Support Clinical Decision Support (CDS) is defined broadly as a clinical system, application or process that helps health professionals make clinical decisions to enhance patient care. Clinical knowledge of interest could range from simple facts and relationships to best practices for managing patients with specific disease states, new medical knowledge from clinical research and other types of information. "Clinical Decision Support systems link health observations with health knowledge to influence health choices by clinicians for improved health care." But decision support that is poorly designed or overly frequent is ignored by (and hated by) clinicians.

.DIC: Dictionary

DIMM: Dual Inline Memory Module (memory chips)

DIN: Deutsche Industrie Norm (standards for connectors)

DIP: Dual In-line Package (e.g., memory chip, DIP switches)

DIR: Directory (list of files)

DLL: Dynamic Link Library

DMA: Direct Memory Access/Addressing

DNS: Domain Naming System (Internet address names)

.DOC: (1) Document; (2) Documentation

DOS: Disk Operating System

DPI: Dots Per Inch

DRAM: Dynamic Random Access Memory

.DRV: Device Driver (Also .DVR)

DSL: Digital Subscriber Line: fast Internet connection over existing phone lines

DTMF: Dual Tone Multiple Frequency (phone tones)

DVD: Digital Video Disk; Digital Versatile Disk; 4.7 GB CD format

EBCDIC: Extended Binary Coded Decimal Interchange Code [IBM] (is to ASCII as Sanskrit is to English)

ECP: Enhanced Capabilities Port [fancy parallel port]

EDIS: An Emergency Department Information System is a tightly integrated computer program that provides patient tracking, physician and nurse charting, discharge instructions, and possibly other functions such as an ED-specific front-end to a hospital-wide CPOE system. See the blue blobby diagram for more possible EDIS functions.

EEPROM: Electrically Erasable Programmable Read-Only Memory

eHI: eHealth Initiative www.ehealthinitiative.org. Major healthcare IT organization.

EIA: Emergency Informatics Association emergencyinformatics.org. Major healthcare IT organization.

EIDE: Enhanced Integrated Drive Electronics (hard drive interface)

EMACS: Editing Macros [Unix text editor favored by the nerdiest of computer geeks and incomprehensible to normal humans]

EOF: End of File (^Z character)

Encryption: Translation of data into a code in order to keep the information secure from anyone but the intended recipient.

Enterprise IT: Big companies. Big networks. Big computers as well as PCs. Software that can handle lots and lots and lots of data (scalable).

EPP: Enhanced Parallel Port

EPROM: (1) Electrically Programmable Read Only Memory; (2) Erasable Programmable Read Only Memory

.EPS: Encapsulated PostScript; PostScript is the language used by high-end printers, as well as for Adobe Acrobat PDF format.

Ethernet: Ethernet is the most commonly used standard for local area network (LAN) architecture. It supports data transfer rates of up to 10 megabits per second, although newer systems, called Fast Ethernet and Gigabit Ethernet, support transfer rates of 100 Mbps and 1 gigabit (1,000 megabits) per second, respectively.

EVDO: EVDO is one flavor of 3G cellular broadband.

FAQ: Frequently Asked Question(s)

FAT: File Allocation Table The master index of a hard drive; also the original hard disk format for PCs, now eclipsed by NTFS.

FDISK: Fixed Disk (DOS utility to format the hard disk.)

File Server: A computer dedicated to managing the flow of information among networked computers and used as a storage location for data and applications shared by network users.

Firewall: A security device situated between a private network and outside networks like the Internet. The firewall screens all information that attempts to enter the system.

Firewire: IEEE 1394 serial port Fast serial port popularized by Apple, but now mostly eclipsed by faster versions of USB.

FLOPS: Floating Point Operations/Second

FYI: For Your Information

GHZ: Gigahertz

.GIF: CompuServe Graphics Interchange Format With JPEG, one of the two most common Web graphics format. Not lossy.

GIGO: Garbage In, Garbage Out

GIS: Geographic Information System

GNU: This is an acronym for the free operating system, recursively named Gnu's Not Unix which is actually very similar to Unix. Despite GNU being eclipsed by Linux, the GNU Public License (GPL) is widely used for free software projects. Over half of the software at SourceForge, the largest repository of free software, uses the GPL.

GPF: General Protection Fault Crash.

GPL: GNU Public License; see GNU, above.

GPS: Global Positioning Satellite/System

GUI: Graphical User Interface

GW-basic: Gee Whiz BASIC

HD: (1) Hard Disk; (2) High Density

HDD: Hard Disk Drive

HDTV: High Definition Television

HEX: Hexadecimal

.HLP: Help

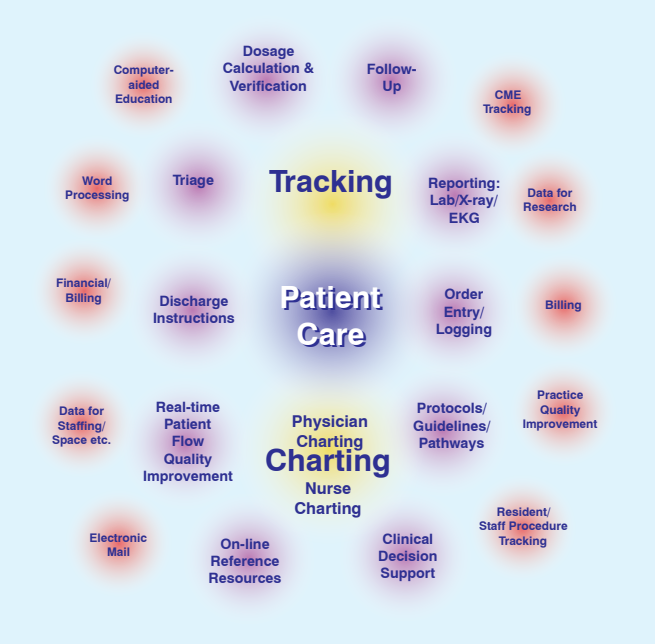
HIMSS: Healthcare Information and Management Systems Society www.himss.org. Major healthcare IT organization.

HIS: A hospital information system (HIS) is the comprehensive information system that manages the administrative, financial and clinical aspects of a hospital. This usually requires a suite of multiple computer systems which, generally, are only partially compatible and interoperable.

The term HIS is also used to refer to hospital information systems that focus solely on clinical aspects, primarily acute-care electronic medical records. There are several large "HIS" (acute-care EMR) vendors, including:

Cerner	GE	QuadraMed
Eclipsys	McKesson	Siemens
Epic	Meditech	

Ratings by independent agency KLAS shows user satisfaction with these products ranges from fair to poor (this is especially true in the ED). Each contains an ED module of varying quality, some of which were developed internally, and some of which were purchased and added on with varying levels of integration. None of the ED modules of the big HIS vendors are of the quality of the best niche EDIS offerings.



HITSP: Health Information Technology Standards Panel www.hitsp.org. Major healthcare IT organization.

HL7: Health Level Seven, Inc. www.hl7.org. Major healthcare IT organization, especially for setting standards.

HP: Hewlett-Packard (Company)

HPFS: High-Performance File System Hard disk file system format, handles bigger hard drives than FAT; introduced with Windows NT, but superseded by slightly-better NTFS.

HPLJ: Hewlett-Packard Laser Jet

.HQX: BinHexed [Macintosh]

HSV: Hue Saturation Value (color model)

HTML: HyperText Markup Language

HTTP: HyperText Transport Protocol

HTTPS: HyperText Transfer Protocol Secure

Hz: Hertz (frequency, per second)

.ICO: Icon

IDE: (1) Integrated Development Environment; (2) Integrated Drive Electronics, also known as Intelligent Drive Electronics

.IDX: Index

IEEE 1394: Firewire

IMAP: Internet Message Access Protocol [Internet; a step up from POP]

IMHO: In My Humble Opinion (email)

Interface Engine: Clinical users are often forced to use multiple computer applications to get or enter clinical information. For example information created in a patient registration system needs to be available in the EMR system, separate ED tracking and charting applications, the laboratory system and the radiology viewer. A common approach is to interface information from one application to many other systems using HL7. Interface engines typically provide functionality such as:

- guaranteed store and forward of messages

Standards

There are many standards relating to specific aspects of EHRs/EMRs, in many cases competing standards. These include:

ANSI X12: also known as EDI – Electronic Data Interchange – this is a standard format used for transmitting business data, developed by the Data Interchange Standards Association. The parties who exchange EDI transmissions are referred to as trading partners. Data that is transmitted often includes what would usually be contained in a typical business document or form. ANSI is the American National Standards Institute, an independent standards-setting organization similar to ASTM.

• CCD: The Continuity of Care Document specification is an XML-based markup standard intended to specify the encoding, structure and semantics of a patient summary clinical document for exchange.

The CCD specification is a constraint on the HL7 Clinical Document Architecture (CDA) standard. The CDA specifies that the content of the document consists of a mandatory textual part (which ensures human interpretation of the document contents) and optional structured parts (for software processing). The structured part relies on coding systems (such as from SNOMED and LOINC) to represent concepts.

The patient summary contains a core data set of the most relevant administrative, demographic, and clinical information facts about a patient's healthcare, covering one or more healthcare encounters. It provides a means for one healthcare practitioner, system, or setting to aggregate all of the pertinent data about a patient and forward it to another practitioner, system, or setting to support the continuity of care. Its primary use case is to provide a snapshot in time containing the pertinent clinical, demographic, and administrative data for a specific patient.

The CCD specification contains U.S. specific requirements; its use is therefore limited to the U.S. The U.S. Healthcare Information Technology Standards Panel has selected the CCD as one of its standards.

Continuity of Care Document (CCD) and Continuity of Care Record (CCR) are often seen as competing standards.

CCR: The Continuity of Care Record is a health record standard specification developed jointly by ASTM International, the Massachusetts Medical Society (MMS), HIMSS, the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), and other health informatics vendors.

The CCR standard is a patient health summary standard. It is a way to create flexible documents that contain the most relevant and timely core health information about a patient, and to send these electronically from one care giver to another. It contains various sections such as patient demographics, insurance information, diagnosis and problem list, medications, allergies and care plan. These represent a "snapshot" of a patient's health data that can be useful or possibly lifesaving, if available at the time of clinical encounter. The ASTM CCR standard is designed to permit easy creation by a physician using an electronic health record (EHR) system at the end of an encounter.

Because it is expressed in the standard data interchange language known as XML, a CCR can potentially be created, read and interpreted by any EHR or EMR software application.

Continuity of Care Document (CCD) and Continuity of Care Record (CCR) are often seen as competing standards.

CEN EN13606: A standard being developed by the CEN (European Committee for Standardization) workgroup TC 251 on EHR Communications. It has been stated that CEN 13606 can only be regarded as "a specification for exchange of EHR Extracts" and cannot act in the capacity as a full EHR system. CEN EN113606 is in use in Australia and Europe. CEN and HL7 are working to "converge" their standards into a single unified standard.

DICOM: the Digital Imaging and Communications in Medicine is a heavily used standard for representing and communicating radiology images and reporting.

HL7: Both a standards-setting organization and a series of standards for healthcare specific data exchange between computer applications. HL7 messages are used for interchange between hospital and physician record systems and between EMR systems and practice management systems; HL7 Clinical Document Architecture (CDA) documents are used to communicate documents such as physician notes and other material.

Another pertinent example is the HL7 standard called CCOW (after the Clinical Context Object Working group) which, when implemented, allows single-signon to multiple clinical applications, where the clinical context (patient and provider) is preserved as switching between applications. CEN and HL7 are working to "converge" their standards into a single unified standard.

ISO TC215: The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from national standards bodies. ISO TC215 standards are used in Europe.

openEHR: public specifications and implementations for EHR systems and communication, based on a complete separation of software and clinical models. The openEHR Foundation is a not for profit foundation supporting the open research, development, and implementation of EHRs.

XML: Extensible Markup Language is a general-purpose markup language for creating special-purpose markup languages, capable of describing many different kinds of data. Its primary purpose is to facilitate the sharing of data across different systems, particularly systems connected via the Internet. Languages based on XML (for example, Geography Markup Language (GML), Physical Markup Language (PML) are defined in a formal way, allowing programs to modify and validate documents in these languages without prior knowledge of their form.

- "out of the box" support for the HL7 standard
- message translation (moving and modifying fields within the HL7 message)
- message routing (messages received from one application and sent to many applications)
- Graphical User Interface (GUI) based configuration and management tools
- Alerts and monitoring

I/O: Input/Output (serial and parallel ports)

.INI: Initialize (stores program preferences for a given user or computer)

IP: Internet Protocol (as in TCP/IP)

IPX: Internetwork Packet Exchange [Novell]

IR: Infrared

IrDA: Infrared Data Association (Ir port standard)

IRQ: Interrupt Request (PC hardware signal)

ISDN: Integrated Services Digital Network (digital phone line)

isEDIS: International Symposium on ED Information Systems isedis.com

ISP: Internet Service Provider

IT: Information Technology

Java: Java is a platform-independent, object-oriented programming language developed by Sun Microsystems and modeled on the programming language C++. Java applets – miniature applications designed to run within another program – now are popular features of Web sites.

Javascript: Javascript is a scripting language for browsers, which, despite the name, is essentially unrelated to Java.

JPEG: Joint Photographic Experts Group

.JPG: JPEG compressed graphics format, is, along with GIF, one of the two most common graphics formats for Web pages. Lossy.

KB: (1) Keyboard;(2) Kilobyte (1,024 bytes; also kB)

kHz: Kilohertz

LAN: Local Area Network

LCD: Liquid Crystal Display

LeapFrog Group: Group of large corporations with large health insurance clout demanding hospitals use CPOE. www.leapfroggroup.org. Major healthcare IT organization.

LED: Light Emitting Diode

Legacy System: An existing IT system or application, often built around a mainframe computer, which generally has been in place for a long time and represents a significant investment. Compatibility with legacy systems is often a major issue when considering new applications.

Li-Ion: Superior but expensive battery technology. Both disposable and rechargeable types available.

Linux: LINUX is a popular free Open-Source version of UNIX Operating system named after Linus Torvalds). Some national governments have adopted Linux as their standard operating system.

listserv: List Server (Internet)

LOL: Laughing Out Loud (email)

Lossy Compression: Some file formats compress files. This compression can be lossless (no data is lost in compression, or lossy, where some data is lost in translation. GIF and TIFF and PNG graphics formats use lossless compression. But JPG graphics use lossy compression which can result in blurring and artifacts, depending on the amount of compression used. Similarly, uncompressed WAV audio files are very large compared to the lossy compression of a (much smaller) MP3 audio file, which can develop audio artifacts (weird sounds) and degraded audio quality.

LPI: Lines Per Inch

LPT: Line Printer

LPT1: First Parallel Printer Port

LPT2: Second Parallel Printer Port

LSI: Large Scale Integration

MB: Megabyte (also mB; 1,000 kilobytes)

MBps: Megabytes Per Second

Mbps: Megabits Per Second

.ME: Usually Read.ME

MEG: Megabyte

MHz: Megahertz (million cycles per second)

MIDI: Musical Instrument Digital Interface. MIDI format files (.MID), which are very small and contain musical notation rather than actual sounds, can be played back by PC sound cards.

MIME: Multipurpose Internet Mail Extension [email attachment protocol]

MIPS: Million Instructions Per Second

MODEM: Modulator Demodulator. A standard telephone modem can connect a computer (albeit at non-broadband speeds) to the Internet. Cable or DSL modems can connect at broadband speeds.

.MP3: MPEG 1 layer 3 compressed audio. MP3 files are now a common way to distribute sound recordings, including music. Lossy.

.MP4: MPEG 4 movie format

MPEG: Moving Picture Experts Group

MS-DOS: Microsoft - Disk Operating System

MSIE: Microsoft Internet Explorer

MTBF: Mean Time Between Failures

.NDX: Index

NICAD: Nickel Cadmium. Rechargable battery type.

NIMH: Nickel-Metal Hydride. Better rechargable battery type.

NHIN: National Health Information Network describes the technologies, standards, laws, policies, programs and practices that enable health information to be shared among health decision makers, including consumers and patients, to promote improvements in health and healthcare. The development of a vision for the NHIN began more than a decade ago with publication of an Institute of Medicine report, "The Computer-Based Patient Record." The path to a national network of healthcare information is through the successful establishment of RHIO.

Niche Vendor: A vendor who provides an Emergency Department Information System (EDIS). Some vendors provide only a single EDIS component, such as discharge instructions, patient tracking, nurse charting, or physician charting. However, most EDIS vendors now provide a comprehensive solution with all of those modules. Niche vendors generally understand ED work processes well and their EDIS systems thus tend to offer superior usability.

NTFS: New Technology File System Hard disk file system format, handles bigger hard drives than FAT; introduced with Windows NT and superseded HPFS.

OCX: OLE Custom Control

OCR: Optical Character Recognition

.OLD: Old version

ONCHIT: Office of the National Coordinator for Healthcare Information Technology www.hhs.gov/healthit Major healthcare IT organization.

openEHR: Open Electronic Health Record Foundation www.openehr.org Major healthcare IT organization.

Open source: Open source means the source code is available to users, who can read and modify the code. Open source software is generally free, and increasingly used in enterprise IT.

OS: (1) Open Source; (2) Operating System

.OVL: Program Overlay

.OVR: Program Overlay

P2P: (1) Peer To Peer; (2) People To People

PC-DOS: Personal Computer - Disk Operating System [IBM]

PCI: Peripheral Component Interconnect/Interface (PC Bus)

PCMCIA: Personal Computer Memory Card International Association

.PCX: Picture Image; seldom-used file type.

PD: Public Domain Basically, free software.

PDA: Personal Digital Assistant

.PDF: Portable Document Format (Adobe Acrobat format)

.PFM: Printer Font Metrics [Windows: For Adobe TypeManager fonts]

PGP: Pretty Good Privacy (name of encryption program)

PIM: Personal Information Manager

PING: Packet Internet Groper PINGing another computer tells you if it's connected to the network.

PIXEL: Picture Element

.PNG: Portable Network Graphics (AKA "PNG's Not GIF") is a superior compressed but non-lossy alternative to GIF format web graphics, but one that many web sites are reluctant to use as it isn't supported by older browsers.

POP: Post Office Protocol (protocol for distributing email)

Popmail: email via POP

PPM: Pages Per Minute

PRN: Printer

PROM: Programmable Read Only Memory

PRTSC: Print Screen

RAID: Redundant Arrays of Independent Disks, also known as Redundant Arrays of Independent Drives or Redundant Arrays of Inexpensive Disks

RAM: Random Access Memory also known as computer "memory chips."

REGEDIT: Registry Editor [Microsoft] The Registry is what, in Windows XP and similar versions of Windows, stores all of the twiddly little details about how the computer and software are configured. Editing the Registry is not for the faint of heart.

Relational Database: A database in which all information is arranged in tables containing predefined fields. Changing a field in one record automatically changes the same field in all related records, allowing for easy global database management. Using SQL, reports and comparisons can be generated by selecting fields of interest from the original database. Common business databases include Oracle, Sybase, SQL server, and mySQL.

REM: Remark (comment); way to disable program lines without actually removing them.

RFID: Radio Frequency Identification Technology uses tiny chips and antennas to track products and store product information.

RJ-11: Standard U.S. phone connector

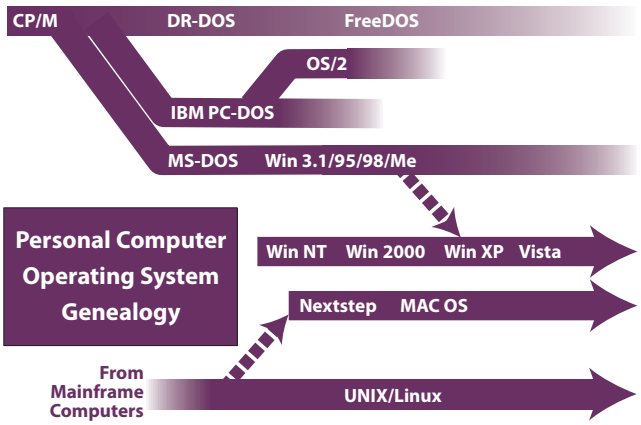
RJ-45: Standard Ethernet connector

RGB: Red-Green-Blue (color model)

RLSI: Ridiculously Large-Scale Integration

RMA: Return Material Authorization or Return to Manufacturer Authorization

ROM: Read Only Memory (chip)



ROTFL: Rolling On The Floor Laughing (email)

RSS: Really Simple Syndication

.RTF: Rich Text Format A non-proprietary standard text format that never really caught on.

Scalability: The ability to add users and increase the capabilities of an application without having to making significant changes to the application software or the system on which it runs.

.SCR: Script

SCSI: Small Computer System Interface (mostly obsolete)

.SEA: Self Extracting Archive [Macintosh]

SMTP: Simple Mail Transfer Protocol (basic email protocol)

SOA: Service-Oriented Architecture A programming paradigm that separates functions into distinct units, or services which developers make accessible over a network in order that users can combine and reuse them in the production of business applications.

SQL: Structured Query Language is a standard command language used to interact with a database.

SRAM: Static Random Access Memory

SSL: Secure Sockets Layer is an older method of web browser security, now supplanted by TLS (though many people still talk about "SSL" when they really mean TLS).

SW: Shareware

.SYS: System Configuration (e.g., CONFIG.SYS in DOS systems)

SYSOP: System Operator

T1, T3, T4: Types of transmission lines in the T-carrier telecommunications system that are often used to provide Internet access to larger organizations. T1 lines can transmit about 1.5 Mbps of data. A T3 line contains 28 T1 lines together and can transmit about 45 times the data of a single T1, enough for full-motion video. Six T3 lines make one T4 line, capable of transmitting about 274 Mbps.

.tar: Tape Archive [Unix]

.tar.Z: Compressed Archived files [Unix]

TCO: Total Cost of Ownership is a long-term view of all costs associated with a specific technology investment. Costs include that of acquiring, installing, using, maintaining, changing, and disposing of a technology during its useful life.

TCP/IP: Transmission Control Protocol/Internet Protocol

TDMA: Tone-Division Multiple Access wireless/cellphone protocol

TEMP: Temporary

Thin Client: In a client/server system, a client with little processing or data storage capability that primarily relies on a central server to perform those functions.

TIFF: Tagged Image File Format

.TIF: TIFF

TLS: Transport Layer Security TLS, the replacement for SSL, is what allows secure web-based transactions.

.TMP: Temporary

Tracking System: An ED ***Tracking System*** is often seen as the most central and critical component of an EDIS. (See the blue blobby diagram.) A tracking system is a computer-based replacement for the traditional ED whiteboard.

From the 1950 nurse-staffed (and perhaps, intern-staffed) "ER" receiving area evolved true, attending-physician staffed Emergency Departments with attention to quality emergency care. EDs took over many of the roles of the family doctor and became massively busier. Parallel evolution, from selection pressure to improve situational awareness, resulted in ***whiteboards***, also known as ***tracking boards***: large, centrally-located dry-erase boards with a spreadsheet-like grid, with a row for each numbered room in the ED.

An ED tracking system replaces the traditional whiteboard – sometimes with a large, central display monitor that literally replaces the whiteboard. But increasingly, displays on many multipurpose PCs throughout the ED replace a single large display. When configured this way, tracking views generally emulate the spreadsheet metaphor of the original whiteboards, but sometimes also offer geographic metaphor views, with a maplike view of the ED. The most effective systems offer a view that cannot be customized by users at the PCs, so it always looks the same to any staff member who walks up a PC. (Views on back-office rather than clinical PCs can usually be customized.) For maximum situational awareness, screen-blankers and timeouts are disabled on such clinical PCs, so a user walking by can view the system without interacting with the PC. Some systems even use the tracking display as a screen-blanker – after a few minutes without user interaction, the PC reverts to the standard tracking screen. For confidentiality reasons, PCs in public areas may have certain data fields hidden until a user signs on.

Essential tracking data may include: room number, patient name, age and sex, chief complaint, triage acuity using the national-standard 5-level Emergency Severity Index, doctor and nurse caring for a patient, status of labs/x-rays/nurse orders (ordered, started, completed and results available), status of calls to consultants, messages from outside the ED about a patient, and provides obvious "flags," preferably using preattentive signals, for when someone (secretary, tech, R.N., doctor) needs to do something for the patient: do an EKG, start an IV, make a decision as all labs or X-rays are back, or page the consultant again as it's been over 15 minutes since the last page.

Most importantly, a tracking system provides that which has been shown to reduce error in the airline industry – situational awareness. Human short-term memory is limited, and, as with the display used by an air traffic controller, the data on the ED tracking system helps prevent error and improves efficiency. The best tracking systems, in accordance with the tenets of Edward Tufte of Yale University, provide different information at different scales. When one clicks on a single patient, one gets a whole screen of detailed information about the patient. When one looks at the board at a whole, focusing on one's name or position, one can see what one's patients need. When staff walk in at the beginning of a shift, even if too far to see letters or numbers, they can see a board full of patients with a large column of mostly green (for example) showing that many of them need to be seen by a physician – and focusing on the colors in the triage column, gives an impression of the severity of illness.

Unlike dry-erase boards, tracking systems can also serve as a front end for accessing other patient information: CPOE, lab results, X-ray and EKG images, old records, or ED charting systems.

Passive tracking depends on nursing staff to "tell" the tracking system when a patient moves, for example, to X-ray; ***active tracking*** uses IR or RFID badges and sensors emplaced in the ED to enter this information automatically, which results in a modest but significant improvement in efficiency.

.TTF: TrueType Font

TWAIN: Technology Without Any Interesting Name (connection between application and scanner software)

UAE: Unrecoverable Application Error

UART: Universal Asynchronous Receiver/Transmitter

UHF: Ultra-High Frequency

UNIX: (AT&T Bell Laboratories Operating System)

UPS: Uninterruptible Power Supply

URI: see URL

URL: Universal Resource Locator

Usability: Usability is a qualitative attribute that assesses how easy user interfaces are to use. The word "usability" also refers to methods for improving ease-of-use during the design process. Usability consultant Jakob Nielsen and computer science professor Ben Shneiderman have written (separately) about a framework of system acceptability, where usability is a part of "usefulness" and is composed of:

- Learnability: How easy is it for users to accomplish basic tasks the first time they encounter the design?
- Efficiency: Once users have learned the design, how quickly can they perform tasks?
- Memorability: When users return to the design after a period of not using it, how easily can they re establish proficiency?
- Errors: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
- Satisfaction: How pleasant is it to use the design?

User Interaction Design: Interaction Design (IxD) is the discipline of defining the behavior of products and systems with which a user can interact. User interaction design aims to minimize the learning curve and to increase accuracy and efficiency of a task without diminishing usefulness. The objective is to reduce frustration and increase user productivity and satisfaction. Certain basic principles of cognitive psychology provide grounding for interaction design. These include preattentive perception, mental models, mapping, interface metaphors, and affordances. Many of these are laid out in Donald Norman's influential book The Design of Everyday Things. Academic research in Human Computer Interaction (HCI) includes methods for describing and testing the usability of interacting with an interface. UI guru Alan Cooper emphasizes the need to use personas – imagined user archetypes – when designing software. While testing and in particular discount usability testing figures in UI design, UI design focuses more on the art and engineering of actually designing software.

UI: User Interface.

USB: Universal Serial Bus serial port standard, available in multiple speeds; 2.0 is much faster than 1.1; most recent PCs have USB 2.0 ports.

USENET: User's Network [Internet]

VGA: Video Graphics Array: IBM/Windows 640x480 color graphics display standard

VHF: Very-High Frequency

VPN: a Virtual Private Network uses public connections, such as the Internet, to link users but relies on encryption and other security measures to ensure that only authorized users can access the network.

.VXD: Virtual device Driver (Windows)

WAN: A Wide Area Network covers a large physical area. A WAN usually consists of multiple local area networks (LANs).

WAP: Wireless Application Protocol is a standard for delivering content to mobile wireless devices such as cellular phones and handhelds.

.WAV: Waveform Audio

Web-Enabled: Refers to software applications that can be used directly through the Web using a browser. Web-enabled applications are often used to collect information from, or make functionality available to, geographically dispersed users (e.g. disease surveillance systems). Some HIS and EDIS products are web-enabled.

WEP: Wired Equivalent Privacy is a security protocol for wireless local area networks (WLANs) using the 802.11x WiFi standard that is now deprecated and has been replaced by WPA.

WiFi: 802.11x short-to-medium range broadband wireless protocol.

Winword: Word For Windows [Microsoft]

.WMF: Windows Metafile Format [Microsoft graphics format]

WPA: Wi-Fi Protected Access is a more robust security protocol than WEP, and with the addition of enterprise EAP standards such as LEAP, are the current standard for wireless security. Many but not all WiFi adapters support LEAP-equivalent security.

WPM: Words Per Minute

.WRI: Windows Write/WordPad file

WYSIWYG: What You See Is What You Get

XGA: Extended Graphics Array [IBM]: generically, 1024x768 color standard

XHTML: Extensible HyperText Markup Language

.z: Packed file (using Pack/Unpack program) lower case z..[Unix]

.Z: Compressed file (using Compress/Uncompress program).upper case Z.[Unix]

ZIF: Zero-Insertion Force (socket)

.ZIP: ZIP Compressed File [PKWare]

More computer terms are defined at: http://www.geocities.com/ikind_babel/babel/babel.html