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Glossary of Terms
Related to Computer-Based Training

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ABSTRACT

Glossary of Terms Related to Computer-Based Training identifies and defines terms that are used in AICC written communications. The definitions reflect aviation industry accepted usage. The definitions of these terms enables them to be used consistently in AICC publications.

KEY WORDS

CBT terms
Definitions
Dictionary
Glossary
Terms

REVISION HISTORY

REV B	25 May 1994
15 October 1992	This is a new document. The contents of each page is published here for the first time. This document represents the terms and definitions approved by the Courseware Subcommittee on 10 Jun 92.
18 November 1992	New definitions and modifications suggested by committee members after the 10 Jun 92 meeting.
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4 February 2003	New definitions added and some existing definitions updated and/or deletedto reflect current industry direction in both hardware and software.

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1.0 INTRODUCTION

Purpose

The AICC publishes a number of documents each year. These include white papers, AICC Guidelines and Recommendations (AGRs), detailed guidelines, and publicity articles.

CBT and training jargon are frequently used in these publications. In many cases these terms may have more than one meaning in the training or computer community. In other cases, these terms may be obscure and poorly defined in standard references like the dictionary.

This publication represents an effort to do several things:

- Make these words concrete. Give each of them understandable real-world meanings.
- Provide definitions that are most frequently appropriate for the aviation training community.
- Make AICC publications consistent by providing definitions that are accepted as usable within the AICC.
- Make AICC publications more understandable by providing definitions that can be used by those who read AICC documents.

Scope

When used in AICC publications, the terms should always be used in a way consistent with the definitions that appear here. The AICC does not intend for these terms to be used by all its members in their own company's publications. Although any group is welcome to use these terms as defined here, the intent of this document is to promote consistent usage in AICC publications only -- not the world at large.

Terminology	AICC Definition
.NET	.NET is both a business strategy from Microsoft and its collection of programming support for what are known as Web services, the ability to use the Web rather than your own computer for various services. Microsoft's goal is to provide individual and business users with a seamlessly interoperable and Web-enabled interface for applications and computing devices and to make computing activities increasingly Web browser-oriented. The .NET platform includes servers; building-block services, such as Web-based data storage; and device software. It also includes Passport, Microsoft's fill-in-the-form-only-once identity verification service. The .NET platform is expected to provide: • The ability to make the entire range of computing devices work together and to have user information automatically updated and synchronized on all of them • Increased interactive capability for Web sites, enabled by greater use of XML (Extensible Markup Language) rather than HTML • A premium online subscription service, that will feature customized access and delivery of products and services to the user from a central starting point for the management of various applications, such as e-mail, for example, or software, such as Office .NET • Centralized data storage, which will increase efficiency and ease of access to information, as well as synchronization of information among users and devices • The ability to integrate various communications media, such as e-mail, faxes, and telephones • For developers, the ability to create reusable modules, which should increase productivity and reduce the number of programming errors According to Bill Gates, Microsoft expects that .NET will have as significant an effect on the computing world as the introduction of Windows. One concern being voiced is that although .NET's services will be accessible through any browser, they are likely to function more fully on products designed to work with .NET code. The full release of .NET is expected to take several years to complete, with intermittent releases of products such as a personal security service and new versions of Windows and Office that implement the .NET strategy coming on the market separately. Visual Studio .NET is a development environment that is now available. Windows XP supports certain .NET capabilities.
A	
ActiveX	ActiveX is the name Microsoft has given to a set of "strategic" object-oriented programming technologies and tools. The main technology is the Component Object Model (COM). Used in a network with a directory and additional support, COM becomes the Distributed Component Object Model (DCOM). The main thing that you create when writing a program to run in the ActiveX environment is a component, a self-sufficient program that can be run anywhere in your ActiveX network (currently a network consisting of Windows and Macintosh systems). This component is known as an ActiveX control. ActiveX is Microsoft's answer to the Java technology from Sun Microsystems. An ActiveX control is roughly equivalent to a Java applet. If you have a Windows operating system on your personal computer, you may notice a number of Windows files with the "OCX" file name suffix. OCX stands for "Object Linking and Embedding control." Object Linking and Embedding (OLE) was Microsoft's program technology for supporting compound documents such as the Windows desktop. The Component Object Model now takes in OLE as part of a larger concept. Microsoft now uses the term "ActiveX control" instead of "OCX" for the component object. One of the main advantages of a component is that it can be re-used by many applications (referred to as component containers). A COM component object (ActiveX control) can be created using one of several languages or development tools, including C++ and Visual Basic, or PowerBuilder, or with scripting tools such as VBScript.

	Currently, ActiveX controls run in Windows 95/98/NT/2000 and in Macintosh. Microsoft plans to support ActiveX controls for UNIX.
Adaptive Training	Training whose form or content varies, based upon the individual needs and measured performance of the student experiencing the CBT lesson.Student variables to which a program could adapt include the following: • Entry level • Learning style • English language proficiency • Learning proficiency (How fast and how well is the student absorbing the material?)
Advanced Distributed Learning (ADL)	The Department of Defense (DoD) and the White House Office of Science and Technology Policy (OSTP) launched the Advanced Distributed Learning (ADL) initiative in November 1997. The purpose of the ADL initiative is to ensure access to high-quality education, training and decision aiding ("mentoring") materials that can be tailored to individual learner needs and made available whenever and wherever they are required. This initiative is designed to accelerate large-scale development of dynamic and cost-effective learning software and to stimulate a vigorous market for these products in order to meet the education and training needs of defense and industry in the 21st century. ADL is developing a common technical framework for computer and Web-based learning that will foster the creation of reusable learning content as "instructional objects." **MIL-HDBK-29612-4 Definition 3.2.26** http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
ActiveX Data Objects (ADO)	An application program interface from Microsoft that lets a programmer writing Windows applications get access to a relational or non-relational database from both Microsoft and other database providers. For example, if you wanted to write a program that would provide users of your Web site with data from an IBM DB2 database or an Oracle database, you could include ADO program statements in an HTML file that you then identified as an Active Server Page. Then, when a user requested the page from the Web site, the page sent back would include appropriate data from a database, obtained using ADO code. Like Microsoft's other system interfaces, ADO is an object-oriented programming interface. It is also part of an overall data access strategy from Microsoft called Universal Data Access. Microsoft says that rather than trying to build a universal database as IBM and Oracle have suggested, finding a way to provide universal *access* to various kinds of existing and future databases is a more practical solution. In order for this to work, Microsoft and other database companies provide a "bridge" program between the database and Microsoft's OLE DB, the low-level interface to databases. OLE DB is the underlying system service that a programmer using ADO is actually using. A feature of ADO, Remote Data Service, supports "data-aware" ActiveX controls in Web pages and efficient client-side caches. As part of ActiveX, ADO is also part of Microsoft's overall Component Object Model (COM), its component-oriented framework for putting programs together. ADO evolved from an earlier Microsoft data interface, Remote Data Objects (RDO). RDO works with Microsoft's ODBC to access relational databases, but not nonrelational databases such as IBM's ISAM and VSAM.
Agent	A program that performs some information gathering or processing task in the background. Typically, an agent is given a very small and well-defined task.

Application Program Interface	An application program interface (API) - and sometimes spelled *application programming interface*) is the specific method prescribed by a computer operating system or by an application program by which a programmer writing an application program can make requests of the operating system or another application. An API can be contrasted with a graphical user interface or a *command interface* (both of which are direct *user interfaces*) as interfaces to an operating system or a program
Ariadne	The Alliance of Remote Instructional Authoring & Distribution Networks for Europe,ARIADNE, Foundation was created to exploit and further develop the results of the ARIADNE and ARIADNE II European Projects, which created tools and methodologies for *producing, managing and reusing computer-based pedagogical elements and telematics supported training curricula*. • Since December 1997, ARIADNE has been involved in standardization activities performed under the auspices of the IEEE LTSC Committee. In this context, ARIADNE has agreed to collaborate with the US funded Educause IMS Project, in view of reaching as quickly as possible an Educational Metadata set that would be widely acceptable. This collaborative work has produced various successive IEEE Working Documents that draw largely on ARIADNE's inputs. Version 2.2 then version 3.4 of this document have been adopted by the IMS Project for its own use (IMS is now working to synchronize its metadat with LOM 6.1). • ARIADNE is also active in the standardization activities initiated by the European Commission, taking place under the auspices of the CEN/LTWS (Learning Technologies Workshop). Work in this forum is now (amongst other subjects) concentrating on the "localization" of the mainly English language results obtained so far at the IEEE. • ARIADNE has recently established cooperation with the ADL Initiative US Project , whose SCORM specification relies on the LOM metadata. For more information go to http://www.ariadne-eu.org/
Active Server Page (ASP)	An HTML page that includes one or more scripts (small embedded programs) that are processed on a Microsoft Web server before the page is sent to the user. An ASP is somewhat similar to a server-side include or a common gateway interface (CGI) application in that all involve programs that run on the server, usually tailoring a page for the user. Typically, the script in the Web page at the server uses input received as the result of the user's request for the page to access data from a database and then builds or customizes the page on the fly before sending it to the requestor. ASP is a feature of the Microsoft Internet Information Server (IIS), but, since the server-side script is just building a regular HTML page, it can be delivered to almost any browser. You can create an ASP file by including a script written in VBScript or JScript in an HTML file or by using ActiveX Data Objects (ADOs) program statements in the HTML file. You name the HTML file with the ".asp" file suffix. Microsoft recommends the use of the server-side ASP rather than a client-side script, where there is actually a choice, because the server-side script will result in an easily displayable HTML page. Client-side scripts (for example, with JavaScript) may not work as intended on older browsers.
ASP.NET	ASP.NET (also called ASP+), is the next generation of Microsoft's Active Server Page (ASP), a feature of their Internet Information Server (IIS). Both ASP and ASP+ allow a Web site builder to dynamically build Web pages on the fly by inserting queries to a relational database in the Web page. ASP+ is different than its predecessor in two major ways: it supports code written in compiled languages such as Visual Basic, C++, C#, and Perl, and it features server controls that can separate the code from the content, allowing WYSIWYG editing of pages. Although ASP+ is not backwards compatible with ASP, it is able to run side by side with ASP applications. ASP+ files can be recognized by their .aspx extension.

Aspect Ratio	The ratio of the horizontal to the vertical sides of a display. In a standard television set, this ratio is 4:3. Most computer monitors have the same aspect ratio.
Asset	Learning content in its most basic form is composed of Assets that are electronic representations of media, text, images, sound, web pages, assessment objects or other pieces of data that can be delivered to a Web client. An Asset can be described with Asset Meta-data to allow for search and discovery within online repositories, thereby enhancing opportunities for reuse.
Assignable Unit (AU)	A training component that can be launched by a CMI or an LMS system, or assigned to a student by the system. It is the smallest element of instruction that a CMI/LMS system assigns and tracks. This unit may vary a little on the instructional hierarchy; however, it is normally equivalent to a lesson.
Asynchronous Communication	Communication of data in which time intervals between transmitted characters may be of unequal length. Transmission is controlled by start and stop elements at the beginning and end of each character. (Compare "synchronous communicaiton.")
Air Transport Association	Group of North American airlines that creates guidelines and provides a forum for members to exchange ideas.
Asynchronous Transfer Mode (ATM)	A network technology based on transferring data in cells or packets of a fixed size. The cell used with ATM is relatively small compared to units used with older technologies. The small, constant cell size allows ATM equipment to transmit video, audio, and computer data over the same network, and assure that no single type of data hogs the line.
Authoring	The process of implementing a CBT lesson. Often an "authoring language" or "authoring system" is used to allow people without formal training in computer programming to prepare the lessons. MIL-HDBK-29612-4 Definition 3.2.82 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Authoring Language	A higher level programming language designed for building courseware. MIL-HDBK-29612-4 Definition 3.2.84 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Authoring System	Easy-to-use software designed for building courseware. Often the authoring system is menu driven and does not require programming experience. Alternatively, it is a development environment that includes both the hardware and software needed to create an interactive multimedia presentation. It may include components (hardware or software) that are not necessarily needed for playback. MIL-HDBK-29612-4 Definition 3.2.85 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
B	
Behavior	An observable action the student is expected to be able to do. MIL-HDBK-29612-4 Definition 3.2.95 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078

Binding	A Binding is based directly on a specification. It defines how to encode, or bind, the "dictionary" elements defined in the specification. Note that as elsewhere in the AICC CMI or SCORM (and within IEEE and IMS as well) specifications, an effort has been made to separate the so-called information model from the binding under the assumption that other encodings (bindings) may one day be used even though the data definitions remain the same. In other words, XML is only one possible encoding; others may emerge over time, but the information model should persist.
C	
C#	C# (pronounced "C-sharp") is a new object-oriented programming language from Microsoft, which aims to combine the computing power of C++ with the programming ease of Visual Basic. C# is based on C++ and contains features similar to those of Java. C# is designed to work with Microsoft's .NET platform. Microsoft's aim is to facilitate the exchange of information and services over the Web, and to enable developers to build highly portable applications. C# simplifies programming through its use of Extensible Markup Language (XML) and Simple Object Access Protocol (SOAP) which allow access to a programming object or method without requiring the programmer to write additional code for each step. Because programmers can build on existing code, rather than repeatedly duplicating it, C# is expected to make it faster and less expensive to get new products and services to market. Microsoft is collaborating with ECMA, the international standards body, to create a standard for C#. International Standards Organization (ISO) recognition for C# would encourage other companies to develop their own versions of the language. Companies that are already using C# include Apex Software, Bunka Orient, Component Source, devSoft, FarPoint Technologies, LEAD Technologies, ProtoView, and Seagate Software.
C++	C++ is an object-oriented programming (OOP) language that is viewed by many as the best language for creating large-scale applications. C++ is a superset of the C language. A related programming language, Java, is based on C++ but optimized for the distribution of program objects in a network such as the Internet. Java is somewhat simpler and easier to learn than C++ and has characteristics that give it other advantages over C++. However, both languages require a considerable amount of study.
Chapter	An arbitrary division of a course. A grouping of subchapters or lessons. Training that relates to a single label. Eighth hierarchy component.
Checklist	A job aid used to determine or ensure a process or procedure is followed. The elements of the activity are listed in the execution sequence.
Color Bit Depth	The number of bits in a graphic card's memory available for specifying the color of a pixel. A 4-bit color depth lets you choose any of 16 colors, 8 bits allows 256, 16 bits give you 65,536, 24 bits allow 16.7 million, and 32 bits permit 16.7 million (the extra 8 bits are used to identify transparency or other effects.) (ref. l)
Common Gateway Interface (CGI)	A standard way for a Web server to pass a Web user's request to an application program and to receive data back to forward to the user. When the user requests a Web page (for example, by clicking on a highlighted word or entering a Web site address), the server sends back the requested page. However, when a user fills out a form on a Web page and sends it in, it usually needs to be processed by an application program. The Web server typically passes the form information to a small application program that processes the data and may send back a confirmation message. This method or convention for passing data back and forth between the server and the application is called the common gateway interface (CGI). It is part of the Web's Hypertext Transfer Protocol (HTTP).

	If you are creating a Web site and want a CGI application to get control, you specify the name of the application in the uniform resource locator (URL) that you code in an HTML file. This URL can be specified as part of the FORMS tags if you are creating a form. For example, you might code: <FORM METHOD=POST ACTION=http://www.mybiz.com/cgi-bin/formprog.pl> and the server at "mybiz.com" would pass control to the CGI application called "formprog.pl" to record the entered data and return a confirmation message. (The ".pl" indicates a program written in Perl but other languages could have been used.) The common gateway interface provides a consistent way for data to be passed from the user's request to the application program and back to the user. This means that the person who writes the application program can makes sure it gets used no matter which operating system the server uses (PC, Macintosh, UNIX, OS/390, or others). It's simply a basic way for information to be passed from the Web server about your request to the application program and back again. Because the interface is consistent, a programmer can write a CGI application in a number of different languages. The most popular languages for CGI applications are: C, C++, Java, and Perl. An alternative to a CGI application is Microsoft's Active Server Page (ASP), in which a script embedded in a Web page is executed at the server before the page is sent.
Computer-Based Training (CBT)	The use of computers to provide an interactive instructional experience. Also referred to as CAI, CAL (Computer-aided Learning), CBE (Computer Based Education), CBI (Computer-based Instruction), etc. The computer is the primary mode of instruction. MIL-HDBK-29612-4 Definition 3.2.178 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Computer-Managed Instruction (CMI)	Has several definitions. In its broadest sense, it includes the following: a. Rostering and storing student information. b. Scheduling students and resources. c. Computer acquisition and storage of student performance data. This is frequently referred to as student data collection instead of CMI. d. Data presentation. After the data has been collected, it can be massaged by the computer, providing meaningful summaries for human interpretation. This is frequently referred to as data analysis instead of CMI. e. And finally, the computer can make decisions based on its analysis of the student's performance. It can manage the student's learning. It makes decisions as to what material the student should cover next, what material is not necessary, and what remedial actions if any, should be taken. In some contexts, the term CMI excludes data collection and data analysis. The strictest definition of CMI includes only the fifth aspect, the computer management of the student. The combination of items c. and d. above, is frequently referred to as student evaluation. MIL-HDBK-29612-4 Definition 3.2.180 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Configuration Management (CM)	A systems management process used to ensure that modifications made in either hardware or software are in accordance with system standards and are compatible with the operation of other system components.
Contract Data Requirements List (CDRL)	A list of the data requirements that are authorized to be acquired for a specific acquisition, which is made a part of the contract
Course Control	Consists of but is not limited to a Recommended Training Data (RTD) Sheet, Curriculum

Document (CCD)	Outline, Course Outline
Computer-Managed Instruction (CMI)	Has several definitions. In its broadest sense, it includes the following: a. Rostering and storing student information. b. Scheduling students and resources. c. Computer acquisition and storage of student performance data. This is frequently referred to as student data collection instead of CMI. d. Data presentation. After the data has been collected, it can be massaged by the computer, providing meaningful summaries for human interpretation. This is frequently referred to as data analysis instead of CMI. e. And finally, the computer can make decisions based on its analysis of the student's performance. It can manage the student's learning. It makes decisions as to what material the student should cover next, what material is not necessary, and what remedial actions if any, should be taken. In some contexts, the term CMI excludes data collection and data analysis. The strictest definition of CMI includes only the fifth aspect, the computer management of the student. The combination of items c. and d. above, is frequently referred to as student evaluation. MIL-HDBK-29612-4 Definition 3.2.180 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Component Object Model (COM)	Microsoft's framework for developing and supporting program component objects. It is aimed at providing similar capabilities to those defined in the Common Object Request Broker Architecture (CORBA), a framework for the interoperation of distributed objects in a network that is supported by other major companies in the computer industry. Whereas Microsoft's Object Linking and Embedding provides services for the compound document that users see on their display, COM provides the underlying services of interface negotiation, life cycle management (determining when an object can be removed from a system), licensing, and event services (putting one object into service as the result of an event that has happened to another object). COM includes COM+, Distributed Component Object Model (DCOM), and ActiveX interfaces and programming tools.
Complex Participation	Level Three of interactivity. The student makes a variety of responses using varied techniques in response to instructional cues.
Component	One of ten levels in the AICC hierarchy of a curriculum. They are from least to most: object, frame, sequence, topic, lesson, module, subchapter, chapter, course, curriculum.
Condition	A stated circumstance under which the performance is to occur That portion of a learning objective or task statement that describes limitations.
Conformance	Conformance is usually defined as testing to see if an implementation faithfully meets the requirements of a standard or specification. There are many types of testing including testing for performance, robustness, behavior, functions and interoperability. Although conformance testing may include some of these kinds of tests, it has one fundamental difference -- the requirements or criteria for conformance must be specified in the standard or specification. This is usually in a conformance clause or conformance statement, but sometimes some of the criteria can be found in the body of the specification. Some standards have subsequent documentation for the test methodology and assertions to be tested. If the criteria or requirements for conformance are not specified, there can be no conformance testing. The general definition for conformance has changed over time and been refined for specific standards. In 1991, ISO/IEC DIS 10641 defined conformance testing as "test to evaluate the adherence or non-adherence of a candidate implementation to a standard." ISO/IEC TR 13233 defined conformance and conformity as "fulfillment by a product, process or service of all relevant specified conformance requirements." In recent years, the term conformity has gained international use and has generally replaced the term

	conformance in ISO documents. In 1996 ISO/IEC Guide 2 defined the three major terms used in this field. • conformity - fulfillment of a product, process or service of specified requirements • conformity assessment - any activity concerned with determining directly or indirectly that relevant requirements are fulfilled. • conformity testing - conformity assessment by means of testing. ISO/IEC Guide 2 also mentions that "Typical examples of conformity assessment activities are sampling, testing and inspection; evaluation, verification and assurance of conformity (supplier's declaration, certification); registration, accreditation and approval as well as their combinations." Conformance tests should be used by implementers early-on in the development process, to improve the quality of their implementations and by industry associations wishing to administer a testing and certification program. Conformance tests are meant to provide the users of conforming products some assurance or confidence that the product behaves as expected, performs functions in a known manner, or has an interface or format that is known. Conformance testing is NOT a way to judge if one product is better than another. It is a neutral mechanism to judge a product against the criteria of a standard or specification.
Content Packaging Specification	The IMS Content Packaging Specification provides the functionality to describe and package learning materials, such as an individual course or a collection of courses, into interoperable, distributable packages. Content Packaging addresses the description, structure, and location of online learning materials and the definition of some particular content types. The Content Packaging Specification is aimed primarily at content producers, learning management system vendors, computing platform vendors, and learning service providers. Learning materials described and packaged using the IMS Content Packaging XML format should be interoperable with any tool that supports the Specification. Content creators can develop and distribute material knowing that it can be delivered on any compliant system, thereby protecting their investment in rich content development.
Content Structure File	Content Structure File. Defined in the AICC CMI Specification to define file formats for exchange for course structure elements.
Course	A complete unit of training. A course generally represents what a student needs to know in order to perform a set of related skills or master a related body of knowledge. Ninth hierarchy component. Level 2 in the AICC Hierarchy of CBT Components: 1. Curriculum 2. Course 3. Chapter 4. Subchapter 5. Module 6. Lesson 7. Topic 8. Sequence 9. Frame 10. Object MIL-HDBK-29612-4 Definition 3.2.215

	http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Courseware	Software that is primarily intended to train or instruct. Instructional material developed for each curriculum. This is the information in lesson plans, flight event descriptions, compute software programs, audiovisual programs, workbooks, and handouts. MIL-HDBK-29612-4 Definition 3.2.228 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Courseware Development	All activities that produce training materials.
Curriculum	A grouping of related courses. Tenth and top hierarchy component. MIL-HDBK-29612-4 Definition 3.2.251 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
D	
Data Model	Analysis of data objects that are used in a business or other context and the identification of the relationships among these data objects. Data modeling is a first step in doing object-oriented programming. As a result of data modeling, you can then define the classes that provide the templates for program objects. A simple approach to creating a data model that allows you to visualize the model is to draw a square (or any other symbol) to represent each individual data item that you know about (for example, a product or a product price) and then to express relationships between each of these data items with words such as "is part of" or "is used by" or "uses" and so forth. From such a total description, you can create a set of classes and subclasses that define all the general relationships. These then become the templates for objects that, when executed as a program, handle the variables of new transactions and other activities in a way that effectively represents the real world. Also see: Unified Modeling Language (UML). Several differing approaches or methodologies to data modeling and its notation have recently been combined into the Unified Modeling Language (UML), which is expected to become a standard modeling language. MIL-HDBK-29612-4 Definition 3.2.258 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Deprecated	Tolerated but not recommended. For example, s number of elements and attributes are deprecated in HTML 4.0, meaning that other methods of accomplishing the task are preferred. Deprecated features may become obsolete in future versions of HTML, though browsers that support the features may continue to support them.
Design Phase	A major phase in the training development process. Determines how to train. Translates analysis data into a blueprint for training. It identifies all resource requirements, training structure, learning objectives, test items, training sequence, student evaluation/ graduation requirements, program of instruction.
Development Phase	A major phase in the training development process. Converts the design into resident and nonresident training materials, e.g., lesson plans, tests, student handouts, media, etc.
Development Team	Individuals identified from various training disciplines who provide expertise in the development of a given instructional product
Distributed Component Object Model (DCOM)	A set of Microsoft concepts and program interfaces in which client program objects can request services from server program objects on other computers in a network. DCOM is based on the Component Object Model (COM), which provides a set of interfaces allowing clients and servers to communicate within the same computer (that is running Windows

	95 or a later version). For example, you can create a page for a Web site that contains a script or program that can be processed (before being sent to a requesting user) not on the Web site server but on another, more specialized server in the network. Using DCOM interfaces, the Web server site program (now acting as a client object) can forward a Remote Procedure Call (RPC) to the specialized server object, which provides the necessary processing and returns the result to the Web server site. It passes the result on to the Web page viewer. DCOM can also work on a network within an enterprise or on other networks besides the public Internet. It uses TCP/IP and Hypertext Transfer Protocol. DCOM comes as part of the Windows operating systems. DCOM is or soon will be available on all major UNIX platforms and on IBM's large server products. DCOM replaces OLE Remote Automation. DCOM is generally equivalent to the Common Object Request Broker Architecture (CORBA) in terms of providing a set of distributed services. DCOM is Microsoft's approach to a network-wide environment for program and data objects. CORBA is sponsored by the rest of the information technology industry under the auspices of the Object Management Group (OMG).
Digital Signal Processor (DSP)	Digital Signal Processor. Essentially a programmable arithmetic co-processor. This is a chip specifically designed to handle digital signals. Usually associated with digitized audio, but also found in digital video circuits.
Digital Video Disc (DVD)	Format for a 12 cm disk (same size as a CD-ROM). It offers the ability to store significantly more data than a CD-ROM disk. Consequently it can store high quality digital video that may eventually replace VHS, laserdisc, CD and CD-ROM.
Discrepancy Report (DR)	A list generated as a result of internal or customer product reviews that documents perceived departures from contracted standards and conventions or differences between product industry specifications/standards and customer expectations.
Distance Learning (DL)	Distance Learning. The use of computers and communications technology to allow the interaction of teachers and students who are not co-located. A more detailed definition from *Guiding Principles for Distance Learning in a Learning Society*, www.acenet.edu/programs/ CALEC/Guides&Principles/distlearn.html:
Distributed Learning	Structured learning that takes place anytime and anywhere it is needed. MIL-HDBK-29612-4 Definition 3.2.292 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Domain Name System (DNS)	The domain name system (DNS) is the way that Internet domain names are located and translated into Internet Protocol addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address. Because maintaining a central list of domain name/IP address correspondences would be impractical, the lists of domain names and IP addresses are distributed throughout the Internet in a hierarchy of authority. There is probably a DNS server within close geographic proximity to your access provider that maps the domain names in your Internet requests or forwards them to other servers in the Internet.
Dynamic Link Library (DLL)	An executable code module for Microsoft Windows that can be loaded on demand and linked at run time, and then unloaded when the code is no longer needed. (ref. (h)) Each library (DLL) contains functions. Each function performs a predefined task. While it

	is running , the main program accesses the library when it needs one of the functions. (ref. (k))
E	
Electronic Performance Support System (EPSS)	Electronic Performance Support System. An integrated electronic environment that is available to and easily accessible by each employee and is structured to provide immediate, individualized on-line access to the full range of information, software, guidance, advice and assistance, data, images, tools, and assessment and monitoring systems to permit the employee to perform his or her job with a minimum of support and intervention by others. Also referred to as *performance support* and *decision support*.
Emulation	Re-Targeting or Re-Hosting of the vendor avionics code and the replication the hardware support layer with the equivalent hardware or software simulation
Enabling Learning Objective (ELO) or Enabling Objective (EO)	A statement in behavioral terms of what is expected of the student in demonstrating mastery at the knowledge and skill level necessary for achievement of a TLO or another ELO
Encapsulation	In Object Oriented Programming (OOP): The combining of attributes and behaviors into a single object. Encapsulation lets a developer conceal proprietary code; and makes the code easier for others to use.
Entry Level Skills	A requirement the trainee must possess before being able to attend a training course or lesson.
Expert System	Computer database that provides opinions about specialized areas. It derives knowledge from human experts (often imprecise, uncertain and anecdotal knowledge), represents that knowledge, and synthesizes it to provide conclusions. An expert system thus provides access to an area of expertise for all users.
Extensibility Of Code	In Object Oriented Programming (OOP): A characteristic of objects that lets developers reuse them to maintain or improve applications without having to access the source code.
F	
Fault Path	Path through that part of the ICW lesson that is seen by a trainee after determining that the aircraft system is not operating properly.
Fiber-Optic Digital Device Interface (FDDI)	A set of ANSI protocols for sending digital data over fiber optic cable. FDDI networks are token-passing networks, and support data rates of up to 100 Mbps (100 million bits) per second. FDDI networks are typically used as backbones for wide-area networks. (from PC Webopedia Dec 1996. www.sandybay.com/pc-web/FDDI.htm)
Fixed-Based Simulator (FBS)	Fixed-Base Simulator . Device that mimics the behavior of an airplane cockpit. It does not provide motion cues and does not require the visual cues that the pilot would see out of the windshield.
Flight Navigation Procedure Trainer (FNPT)	The JAA and CAA defined level of trainer similar to the above FTD.
Flight Training Device (FTD)	Flight Training Device. Full scale replica of an airplane's instruments, equipment, panels, and controls in an open flight deck area or an enclosed airplane cockpit, including the assemblage of equipment and computer software programs necessary to represent the airplane in ground and flight conditions to the extent of the systems installed in the device; does not require a force (motion) cueing or visual system; is found to meet the criteria outlined in this AC for a specific flight training device level; and in which any flight training event or flight checking event is accomplished. (FAA 120-45A)

Frame	In video and videographics: A complete picture as placed on the TV screen in 1/30 second. In CBT: A meaningful visual image and any interaction associated with that image. The contents of a single CRT presentation that appears at a single point in time during a lesson. Second hierarchy component.
Frequency	The rate at which something occurs. In electronics/computers freuency refers to the rate of an oscilator or signal. The rate is measured in cycles per second and the unit is known as hertz. With a frequency of 1 kilohertz, an oscillator would drive a computer clock to send out a pulse, 1,000 times every second. The unit: hertz, is named in honor of the German physicist Heinrich Hertz (1857 ~ 1894). The inverse of frequency is period. This is the time for one cycle to occur. With a frequency of 1 kilohertz, one cycle occurs in 1/1,000 of a second (there are a thousand cycles every second at 1 kilohertz), thus the period of one cycle is 1 miliscond. Computers operate at megahertz frequencies, therefore, timing periods are measured in microseconds.
Full Flight Simulator (FFS)	Device that emulates the behavior of an airplane cockpit. It provides audio, communication, visual and motion cues as well as tactile cues to the pilot.
Full-Frame Video	Motion video that fills the computer screen. As opposed to motion video in a small window of the screen.
Full-Motion Video	Video sequences or systems that provide enough images per second to afford the illusion of smooth motion. Often defined as the rate of US standard video (NTSC) signals (30 frames per second.)
G	
GUI	A GUI (usually pronounced GOO-ee) is a graphical (rather than purely textual) user interface to a computer. As you read this, you are looking at the GUI or graphical user interface of your particular Web browser. The term came into existence because the first interactive user interfaces to computers were not graphical; they were text-and-keyboard oriented and usually consisted of commands you had to remember and computer responses that were infamously brief. The command interface of the DOS operating system (which you can still get to from your Windows operating system) is an example of the typical user-computer interface before GUIs arrived. An intermediate step in user interfaces between the command line interface and the GUI was the non-graphical *menu-based interface*, which let you interact by using a mouse rather than by having to type in keyboard commands. Today's major operating systems provide a graphical user interface. Applications typically use the elements of the GUI that come with the operating system and add their own graphical user interface elements and ideas. A GUI sometimes uses one or more metaphors for objects familiar in real life, such as the desktop, the view through a window, or the physical layout in a building. Elements of a GUI include such things as: windows, pull-down menus, buttons, scroll bars, iconic images, wizards, the mouse, and no doubt many things that haven't been invented yet. With the increasing use of multimedia as part of the GUI, sound, voice, motion video, and virtual reality interfaces seem likely to become part of the GUI for many applications. A system's graphical user interface along with its input devices is sometimes referred to as its "look-and-feel."
H	
Hertz	Term for "cycles per second," used to measure the rate of sound wave (or any signal)

	oscillations.
Hierarchy	The structure of lessons and/or courses which, to a large extent, determines how the student will perceive the course organization and in what order his lessons will be assigned.
High Definition Television (HDTV)	High Definition Television. A wide-screen, high-resolution form of broadcast television. HDTV may be analog or digital.
High Simulation Presentation	See Category Three of ICW presentation
Higher Level Language	A set of computer instructions that can be understood by a human being. These instructions can be combined to create a computer program. A program must be translated into machine language before it can be executed by the computer.
Hyper-Text Markup Language (HTML)	A standard format for text and graphics to be displayed together using a two-dimensional page metaphor. It is an SGML based markup and tagging scheme. It is a platform-independent standard that is used for most displays on the World Wide Web. HTML is capable of expressing both textual and pictorial data, and can provide some limited formatting features for each of them; beyond this, it provides a linkage mechanism to connect text passages in the same file, text in other files, and interactive or multimedia information.
Hypertext Transfer Protocol (HTTP)	Provides a rapid file-transfer mechanism. This protocol is used extensively on the World Wide Web.
Hypermedia	A hypertext-type document that contains text and at least one of the following: Graphics, video, animation, and audio. Triggers, or pre-defined areas on the screen can be linked to sections of the file that contain information in different media. Nodes of text, data and graphics can be programmed to allow users to set their own course through islands of information.
Hypertext	A method of information delivery that provides multiple connected pathways through a body of information, allowing the user to jump easily from one topic to related or supplementary material.
I	
Icon	A small picture or figure that represents an object or a concept, and attempts to imply an idea of what it represents. Typical objecs represented are disks, documents, and folders. Typical concepts are "forward," "backward", "help." Frequently, icons appear on the computer screen. When selected with a pointing device such as a mouse, the icon initiates a computer activity. In the best of icons, the picture makes it obvious what the computer action will be.
Inheritance	In Object Oriented Programming (OOP): When objects are arranged in a hierarchy, the ability of some to acquire attributes and behaviors of objects above them without duplicating the code.
Initial Objectives	Objectives written as output from content and task analysis, from which a detailed hierarchy can be created and formal objectives can be written.
Input/Output (I/O)	Refers to the data flow into or out of a computer system or subsystem.
Institute of	Described as "the world's largest technical professional society -- promoting the

Electrical and Electronics Engineers (IEEE)	development and application of electro-technology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of our members." The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and several large societies in special areas, such as the IEEE Computer Society.
Instructional Design	The philosophy, methodology, and approach used to deliver information. Some courseware aspects include question strategy, level of interaction, reinforcement, and branching complexity.
Instructional Designer (ID)	Person who integrates advanced learning theories, strategies, practices, and technologies into organization plans and processes. Establishes performance objectives, evaluation plans, and metrics to ensure that instructional programs achieve expected goals.
Instructional Hierarchy	Description of the relationship of the components on a training system. The layers in an instructional system. From the top level of the hierarchy looking down, each component can be seen as a child of the level above. The labels for each level in the hierarchy used by the AICC are (from highest to lowest) curriculum, course, chapter, sub-chapter, module, lesson, topic, sequence, frame, object. Also known as learning hierarchy or aggregation hierarchy.
Instructional Hour	An hour in the instructional day consisting of 50 minutes of contact time normally followed with a ten minute break.
Instructional Systems Design (ISD)	A generic term for the procedures involved in analysis of training needs and development of learning activities. The learning activities may involve any media. The emphasis in ISD is on a systems approach to training. The Instructional Systems Designer creates the process for building lessons. MIL-HDBK-29612-4 Definition 3.2.534 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Instructional Transaction Theory	Concept introduced by Dr M. David Merrill in 1985. "An *instructional transaction* is a mutual, dynamic, real-time give-and-take between an instructional system and a student in which there is an exchange of information. It is the complete sequence of presentations and reactions necessary for the student to acquire a specific type of instructional goal. It requires active mental effort by the student. Its effectiveness is determined by the match between the nature of the student's interaction and resulting mental processing with the type of task and subject matter content to be learned. "*Instructional Transactions* are instructional algorithms, patterns of learner interactions (usually far more complex than a single display and a single response) which have been designed to enable the learner to acquire a certain kind of knowledge or skill. Different kinds of knowledge and skill would require different kinds of transactions. The necessary set of these instructional transactions are designed and programmed once, like other applications such as spreads sheets and word processors. These instructional programs are called *instructional transaction shells*. These transaction shells can then be used with different content topics as long as these topics are of a similar kind of knowledge or skill." (M. David Merrill, "An Introduction to Instructional Transaction Theory", Utah State University, July 1991.)
Instructional Unit	An assembly of lessons that have been integrated either to complete a usable bit of

	knowledge or skill or to aid in scheduling a course or program. The basic components of courses.
Instructor Guide	A course level publication designed to provide the administrator of instructional materials with information about the objectives of the materials, the procedures involved in their development, suggestions for their optimal use, and descriptions of what might be expected from the materials based on their previous effectiveness.
Interactive Electronic Technical Manual (IETM)	Interactive Electronic Technical Manual. A package of information arranged and formatted for interactive screen presentation to the end-user. As originally defined by the US Department of Defense, IETMs relate to weapon systems documentation.
Interactive Multimedia Instruction (IMI)	A term applied to a group of predominantly interactive, electronically-delivered training and training support products. IMI products include instructional software and software management tools used in support of instructional programs.
Interaction	An exchange between a student and a computer program. It begins with a screen touch, a mouse click, a key press or other input by a student. It ends when the discernible reaction of the program is complete. The program may react visually, aurally, or in any other way that can be perceived by the student.
Interactive Courseware (ICW)	Term used to describe CBT with the emphasis on interactivity. Presumably, simple "page turning" courseware could not properly be called ICW. Interactive Courseware (ICW) There are four categories of ICW presentation, descriptions are as follows: **Category One of ICW presentation** Low Grade Presentation. This is the lowest (baseline) category of ICW development. It is normally a knowledge or familiarization lesson, provided in a linear format (one idea after another). Category 1 is primarily used for introducing an idea or concept. The user has little or no control over the sequence and timed events of the lesson material. Minimal interactivity is provided by selective screen icons and inserted into the lesson through typical input/output peripherals and programming protocols. This category may include simple developed graphics and/or clip art, customer provided video and audio clips. **Category Two of ICW presentation** Medium Grade Presentation. This category involves the recall of more information than a Category 1 presentation and allows the student more control over the lesson's scenario through screen icons and other peripherals, such as light pens or touch screens. Typically Category 2 is used for non-complex operations and maintenance lessons. Simple emulations or simulations are presented to the user. As an example, the user is requested to rotate switches, turn dials, make adjustments, or identify and replace a faulted component as part of a procedure. This category also may include simple to standard developed graphics, and/or clip art, and customer provided video and audio clips. **Category Three of ICW presentation** High Simulation Presentation. This category involves the recall of more complex information (compared to Categories 1 and 2) and allows the user an increased level of control over the lesson scenario through peripherals such as light pen, touch screen, track ball, or mouse. Video, graphics, or a combination of both are presented simulating the operation of a system, subsystem, or equipment to the user. The lesson scenario training material typically is complex and involves more frequent use of peripherals to affect a transfer of learning. Operation and maintenance procedures are normally practiced with Category 3 scenarios and students may be required to alternate between multiple screens

	to keep pace with the lesson material. Multiple software branches (two to three levels) and rapid response are provided to support remediation. Emulations and simulations are an integral part of this presentation. This category may also include complex developed graphics, and/or clip art, and customer provided video and audio clips. **Category Four of ICW presentation** Real-time Simulation Presentation. This ICW category involves more in-depth recall of a larger amount of information (compared to Categories 1, 2, and 3) and allows the user an increased level of control over the lesson. Every possible subtask is analyzed and presented with full, on-screen interaction, similar to the approach used in aircraft simulator technology. The lesson material is extremely complex and involves more frequent use of peripherals to affect the transfer of learning. This category normally supports certification, recertification or qualification requirements. Complicated operation and maintenance procedures are normally practiced with Category 4 and involves all of the elements of Categories 1, 2, and 3 presentations plus 1) a high degree of interactivity, 2) an extensive branching (four or more levels), and 3) levels of sophistication - short of artificial intelligence.
Interactive Video	The convergence of video and computer technology: A video program and a computer program running in tandem under the control of the person in front of the screen. In interactive video, the user's actions, choices and decisions affect the way in which the program unfolds. The opposite of interactive video is linear video (e.g. a television program).
Interface	Three meanings: • The user interface, where people communicate with the software through commands and other devices. • The connections in software that allow an application to work with the operating system, or that allow the operating system to work with the hardware. • The hardware cards, plugs, and other devices used to move data from place to place.
Internet	The Internet is a network of computer networks, freely exchanging information around the world. The Internet was developed during the 1960s by the US Defense Department's Advanced Research Projects Agency (ARPA) for national security reasons. The goal was to build a network that could automatically route data around downed circuits or computers. To aid in the orderly use of this technology, ARPA supported the development of protocols for transferring data. These file transfer protocols (ftps) are now used among all Internet users. During the 1980s, the Internet expanded as private and public research facilities, government agencies and academic institutions began using the technology. Today, the Internet connects more than 4 million computers and over 30 million users worldwide. MIL-HDBK-29612-4 Definition 3.2.573 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Interrupts	A request-for-attention signal sent by either hardware or software to the CPU that causes the CPU to suspend some operations and transfer control to an interrupt handler. (ref. (h)
Intranet	The use of Internet technology in a private, company-owned network.
Integrated Services Digital Network (ISDN)	The twisted pair line that comes into the average home for voice telephone is does not carry digital data - it carries analog signals. When a modem is connected, the modem changes a digital signal coming from the computer into an analog signal that can travel over the phone lines. This analog signal can carry from 2400 to 9600 bits per second (bps).

	Such a system could carry voice messages (digitized) and still have bits left over to carry data at the same time. This is the foundation of ISDN.
International Standards Organization (ISO)	The International Standards Organization is made up of the national standards-making bodies of each country, ANSI in the case of the U.S. ISO, in cooperation with the International Electro-technical Commission (IEC), develops information processing standards.
J	
Java	Internet programming language promoted by Sun Microsystems. Unlike ordinary software applications, which take up megabytes on the hard disk of a PC, Java applications, or "applets," are little programs that reside on the network in centralized servers. The network delivers them to the connected machine only when it needs them; because the applets are so much smaller than conventional programs, they don't take forever to download. Java programs, once written, can run without modification on just about any kind of computer: a PC, a Macintosh, a Unix workstation, or even a mainframe. The underlying operating system makes no difference. The Java language lets programmers use software "components"-- Tinkertoy pieces handling specific tasks, such as text editing, charting, modeling, or business-form design. Components can be assembled quickly and easily into all manner of customized applications.
Java 2 Platform Enterprise Edition (J2EE)	Java platform designed for the mainframe-scale computing typical of large enterprises. Sun Microsystems (together with industry partners such as IBM) designed J2EE to simplify application development in a thin client tiered environment. J2EE simplifies application development and decreases the need for programming and programmer training by creating standardized, reusable modular components and by enabling the tier to handle many aspects of programming automatically. J2EE includes many components of the Java 2 Platform, Standard Edition (J2SE)
Javascript	JavaScript is an interpreted programming or script language from Netscape. It is somewhat similar in capability to Microsoft's Visual Basic, Sun's Tcl, the UNIX-derived Perl, and IBM's REX. In general, script languages are easier and faster to code in than the more structured and compiled languages such as C and C++. Script languages generally take longer to process than compiled languages, but are very useful for shorter programs. JavaScript is used in Web site development to do such things as: • Automatically change a formatted date on a Web page • Cause a linked-to page to appear in a popup window • Cause text or a graphic image to change during a mouse rollover JavaScript uses some of the same ideas found in Java, the compiled object-oriented programming derived from C++. JavaScript code can be imbedded in HTML pages and interpreted by the Web browser (or client). JavaScript can also be run at the server as in Microsoft's Active Server Pages before the page is sent to the requestor. Both Microsoft and Netscape browsers support JavaScript, but sometimes in slightly different ways.
Java Server Page (JSP)	A technology for controlling the content or appearance of Web pages through the use of servlets, small programs that are specified in the Web page and run on the Web server to modify the Web page before it is sent to the user who requested it. Sun Microsystems, the developer of Java, also refers to the JSP technology as the Servlet application program interface (API). JSP is comparable to Microsoft's Active Server Page (ASP) technology.

	Whereas a Java Server Page calls a Java program that is executed by the Web server, an Active Server Page contains a script that is interpreted by a script interpreter (such as VBScript or JScript) before the page is sent to the user. An HTML page that contains a link to a Java servlet is sometimes given the file name suffix of .JSP.
Joint Aviation Authorities (JAA)	An associated body of the European Civil Aviation Conference (ECAC) representing the civil aviation regulatory authorities of a number of European States who have agreed to co-operate in developing and implementing common safety regulatory standards and procedures. This co-operation is intended to provide high and consistent standards of safety and a "level playing-field" for competition in Europe. Much emphasis is also placed on harmonising the JAA regulations with those of the USA.
Joint Photographic Experts Group (JPEG)	A working group established to develop a standard for compressing and storing still images in digital form. A subgroup of the International Standards Organization (ISO). Alternatively, refers to the standard developed by this group. Adhering to this standard means that JPEG files can be decompressed by various vendors regardless of who compressed them.
K	
Kilobyte (KB)	Sometimes used as equivalent to 1024 bytes, sometimes equivalent to 1000.
Kilohertz (KHz)	Used to measure rate at which waves oscillate. One kilohertz equals 1000 cycles per second. Also used in discussions of sampling rates for audio signals being converted to digital information. An 8 kHz sampling rate means that the audio waveform is being sampled 8000 times per second.
Knowledge-Based System	System in which the problem-solving knowledge is separated from the decision-making knowledge. In a conventional system, the two forms of knowledge are in one big program. In a knowledge-based system, the knowledge specific to problem-solving is separated from the knowledge for deciding how to use the problem-solving knowledge. See also *expert system.*
L	
Local Area Network (LAN)	A combination of hardware and software by which computers are physically and logically connected for interactive communication. The communications are limited to an area such as a single office building and do not extend across public rights-of-way. "A LAN allows PCs to have access to common data and peripherals, and it typically consists of PCs with adapter cards, file servers, printers, gateways to departmental or corporate computers, and network software to integrate these components."
Light Amplification by Stimulation of Emission of Radiation (Laser)	An amplifier and generator of coherent energy in the optical, or light region of the spectrum
Latency	Additional response time of the FTD beyond that of the basic aircraft perceivable response time. This includes the update rate of the computer system combined with the time delays

	of the instruments, and, if installed, the time delays of the motion and visual systems.
Liquid Crystal Display **(LCD)**	Technology used to make flat panel computer displays. LCDs work by subtracting or filtering light transmitted through the back of the panel by an external light source. These displays are most frequently used in lap top portables and overhead projectables.
Learning Content Management System (LCMS)	A learning content management system is a multi-developer environment where developers can create, store, reuse, manage and deliver learning content from a central object repository. An LCMS will generally have a majority of the following characteristics. You can use this checklist to determine if a software application could be called a learning content management system. Common Characteristics Checklist: • Based on a learning object model. • Content is reusable across courses, curricula or across the entire enterprise. • Content is not tightly bound to a specific template and can be re-deployed in a variety of formats such as e-Learning, CD-ROM, print-based learning, PALM, EPSS, etc. • Navigational controls are not hard coded at the content (or page) level. • There is a complete separation of content and presentation logic. • Content is stored in a central database repository. • Content can be represented as XML or is stored as XML. • Content can be tagged for advanced searchability (both at the media and the topic level). • Pre-tests and post-tests can be automatically aggregated from test questions written for the primary instruction. In addition, the system can deliver the test and prescribe learning based on performance. • The system manages the development process by providing some level of workflow tools to manage a multi-developer, team environment. • Version controls and archiving capabilities to store previous versions of content. • Advanced searching capabilities across all objects in the repository. • Interoperability with third-party learning management systems. • Includes a delivery engine for serving up content, automatically adapting to user or group profiles, adding navigation controls, collaboration tools, utilities, and look and feel (skins). Learning management systems (LMS) and learning content management systems (LCMS) really have two very different functions. It's unfortunate that both have such similar names and a shared acronym, which only serves to confuse e-Learning buyers even more. The primary objective of a learning management system (LMS) is to manage learners, keeping track of their progress and performance across all types of training activities. By contrast, a learning content management system (LCMS) manages content or learning objects that are served up to the right learner at the right time.
Lead Designee	Reviewer assigned by the Technical Coordinator to perform a Product Assurance Review.
Learning Hierarchy	Description of the relationship of the components on a training system. The layers in an instructional system. From the top level of the hierarchy looking down, each component can be seen as a child of the level above. The labels for each level in the hierarchy used by the AICC are (from highest to lowest) curriculum, course, chapter, sub-chapter, module, lesson, topic, sequence, frame, object. Also known as instructional hierarchy.

Terminology	AICC Definition
Learning Object	Self-contained chunks of training content that can be assembled with other LOs to create courses and curricula. MIL-HDBK-29612-4 Definition 3.2.622 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Learning Outcomes	Knowledge, skills, or attitudes that the student is expected to demonstrate as an end result of a specific course of instruction.
Lesson	A meaningful division of learning that is accomplished by a student in a continuous effort -- that is at one sitting. That part of the learning that is between designed breaks. Frequently requires approximately 20 minutes to an hour. A unit of training that is a logical division of a subchapter, chapter, or course. Fifth hierarchy component. MIL-HDBK-29612-4 Definition 3.2.630 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Lesson Plan	A plan for instruction that provides specific definition and direction to the instructor on learning objectives, equipment, instructional media material requirements, and conduct of the training. Lesson plans are the principal component of curriculum materials in that they sequence the presentation of learning stimuli and coordinate the use of supporting instructional materials.
Level Of Interactivity	A two-way communication in which stimuli/response is direct and continual. Interactivity describes the degree of student involvement/interactivity in the instructional activity. There are four levels of interactivity, they are: Level 1 - Passive. The student acts solely as a receiver of information. Level 2 - Limited participation. The student makes simple responses to instructional cues. Level 3 -Complex participation. The student makes a variety of responses using varied techniques in response to instructional cues. Level 4 - Real-time participation. The student is directly involved in a life-like set of complex cues and responses.
Level Of Learning	The degree to which a student is expected to develop knowledge or understanding of a subject, learn facts, internalize a set of values, or display proficiency in a psychomotor skill. Category of learning that ranges from least complex to most complex, commonly used to classify the behavior a student is expected to demonstrate. The levels are knowledge, comprehension, application, analysis, synthesis, and evaluation. NOTE: Unable to locate definitions of the levels.
Likert Test	A Likert test is made up of a series of Likert questions. Each question offers the student a group of alternatives on a continuum. The response is generally based on the student's opinion or attitude. One way in which the Likert test differs from a multiple choice test is that the Likert test has no correct answer for each question.
Limited	Level Two of interactivity. The student makes simple responses to instructional cues.

Participation	
Link	Hypermedia term. A key word, phrase, or area on the screen that connects to a different node in a hypermedia data base. It can be viewed as a cross reference or an indication that more information on a topic is available. Links permit a reader to browse through a database, following paths of interest.
Learning Management System (LMS)	A software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums. The Advanced Distance Learning group, sponsored by the United States Department of Defense, has created a set of specifications called Shareable Content Object Reference Model (SCORM) to encourage the standardization of learning management systems.
Learning Object Metadata (LOM)	A standard (or set of standards) that specifies a conceptual data schema that defines the structure of a metadata instance for a learning object. For the standard, a learning object is defined as any entity, digital or non-digital, that may be used for learning, education or training. For the standard, a metadata instance for a learning object describes relevant characteristics of the learning object to which it applies. Such characteristics can be regrouped in general, educational, technical and classification categories. The conceptual data schema specified in this standard will allow for linguistic diversity of both learning objects and the metadata instances that describe them. The conceptual data schema defined in the standard specifies the data elements of which a metadata instance for a learning object is composed. The standard will be referenced by other standards that will define the implementation descriptions of the data schema so that a metadata instance for a learning object can be used by a learning technology system to manage, locate, evaluate or exchange learning objects. The standard does not define how a learning technology system will represent or use a metadata instance for a learning object.
LOM - smallest permitted maximum	For implementation-defined values, the smallest permitted maximum value. Example: "The smallest permitted maximum character string length of data element X shall be 17."
LOM - value space	The set of values for a given data type. In LOM, a value space is typically enumerated outright, or defined by reference to another standard or a vocabulary
LOM - vocabulary	Vocabularies are defined for some data elements. A vocabulary is a recommended list of appropriate values. Other values, not present in the list, may be used as well. However, metadata that rely on the recommended values will have the highest degree of semantic interoperability, i.e. the likelihood that such metadata will be understood by other end users is highest.
LOM –langstring	A specific LOM data type that represents phrases in one or several human languages. Multiple semantically equivalent phrases can be included, as in the case of translations or alternative descriptions
Low Grade Presentation	See Category One of ICW presentation.
M	
Manifest	There may be situations where a content developer would like to package multiple distinct

	courses for delivery into a system. This situation can be done by bundling each course up in separate (sub)manifests. If a content developer wants to move multiple courses in a Package (a curriculum), the content developer would use a top-level manifest to contain each course level manifest and any instructional object manifests that each course might contain. The scope of a manifest is elastic. A manifest can describe part of a course that can by itself outside of the context of a course (an instructional object), an entire course, or a collection of courses. This decision is given to content developers to describe their content in the way they want it to be considered for aggregation or dissaggregation. The general rule is that a Package always contains a single top-level manifest that may contain one or more (sub)manifests. The top-level manifest always describes the Package. Any nested (sub)manifests describe the content at the level to which the (sub)manifest is scoped, such as a course, instructional object, or other. For example, if all content comprising a course is tightly couple that no part of it may be presented out of the course context, a content developer would want to use a single manifest to describe that course's resources and organization. However, content developers who create 'instructional objects' that could be recombined with other 'instructional objects' to create different course presentations would want to describe each 'instructional object' in its own manifest, then aggregate those manifests into a higher level manifest containing a course organization.
Media	"Physical means for providing the instructional content. Includes entire set of instructional presentation materials; e.g., workbooks to simulators." The means, instruments, or materials used to communicate information to the students. Examples include: printed materials, overhead transparencies, videotape recordings, and multimedia presentations.
Medium Grade Presentation	See Category Two of ICW presentation
Megabyte	A measure of data storage equivalent to roughly one million characters of text. Abbreviation: Mb. To be more precise, 1,048,576 bytes or 1,024 kilobytes.
Megahertz (MHz)	Millions of clock cycles per second. The speed at which a PC can operate is measured in megahertz. It is analogous to the speed of a motor vehicle. Consider each type of CPU as a different kind of car. The faster it goes (the greater the number of megahertz), the more work gets done (the more seat miles roll by).
Mental Model	A conceptual understanding of the way objects work, events take place, or people behave. These models result from the human tendency to form explanations of things. Mental models are based on whatever knowledge exists in the student, real or imaginary, naïve or sophisticated. In commercial aviation, mental models are commonly known as "situational awareness."
Metadata	Metadata for a learning object describes relevant characteristics of the learning object to which it applies. Such characteristics can be regrouped in general, educational, technical and classification categories. Metadata standards facilitate search, evaluation, acquisition, and use of learning objects, for instance by learners or instructors. The purpose is also to facilitate the sharing and exchange of learning objects, by enabling the development of catalogs and inventories

	while taking into account the diversity of cultural and lingual contexts in which the learning objects and their metadata will be exploited. By specifying a common conceptual data schema for metadata, bindings of Learning Object Metadata will have a high degree of semantic interoperability. As a result, transformations between bindings will be straightforward.
Midi	Musical Instrument Digital Interface. A means by which a musician can capture music as a series of values rather than as sampled sounds. A MIDI file can be electronically edited and mixed in hardware or software called a "sequencer," then played back through a synthesizer in a totally different form. MIDI enables the addition of music to CBT programs with far smaller disk storage requirements than sampled (digitized) sound.
Milisecond	One-thousandth of a second
Multipurpose Internet Mail Extension (MIME)	Protocol is a standardized method of sending and receiving attachments. An attached file is specified, and the mail client encodes and sends it; the recipient's mail client decodes the attachment and displays it as part of the message. If the attached file has an extension, the mail client launches the associated application. Although it was conceived for use with email messages, MIME has a much wider applicability. When a client receives a MIME message the content type is used to invoke the appropriate viewer.
Millions of Instructions Per Second (MIPS)	This is a measure of computer processing speed. It refers to the average number of machine language instructions performed by the CPU in one second. MIPS is a measure of raw CPU performance, but it does not always correspond to overall system performance. Also MIPS Computer Systems Inc. is the name of a company that builds computer systems, designs compilers, and has designed and licensed a RISC architecture embodied in the R3000 and R4000 CPU chips.
Modeled Simulation	Importing and coding (Manually or Automatically) directly from aircraft manufacturers or avionics vendors chart based data or algorithms.
Modem	A device that allows one computer to connect to another computer through telephone lines. A communications program is needed to use the modem.
Module	Sixth hierarchy component. MIL-HDBK-29612-4 Definition 3.2.736 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Mouse	Remote, hand-held device that when moved across a surface, directs a cursor to move across a computer screen.
Moving Picture Experts Group (MPEG)	Standard for digital video. It is a compression standard for audio, video, and data supported by the International Standards Organization. The MPEG standard was originally divided into four different types, MPEG-1 through MPEG-4. The different types are not succeeding versions of the same algorithm but rather totally different algorithms designed to respond to different bandwidth and quality requirements for digital video. The word MPEG is usually used to refer to MPEG-1. MPEG-1 was accepted in January 1992. MPEG compresses video and audio at levels near 200:1, while maintaining decent image and audio quality. It enables a relatively small data flow (approximately what is possible with a single speed CD-ROM) and a quality approximately equal to a VHS image (playing back in the Extended Play mode) with 30 frames per second. MPEG-1 usually

	comes in Standard Interchange Format (SIF), which is established at 352x240 pixels with 16 million colors and a data flow rate of 1.5 megabits (Mbits) per second. MPEG-2 has two accepted standards. MPEG-1 was accepted in January 1992. MPEG-2 was accepted in November of 1994. It is designed for all-digital transmission of broadcast TV quality video and high definition television (HDTV). Although the quality of the MPEG-2 image is much higher than MPEG-1, it has data storage and bandwidth requirements that are four times those of MPEG-1.
Microsoft Intermediate Language (MSIL)	CPU-independent instruction set into which .NET Framework programs are compiled. It contains instructions for loading, storing, initializing, and calling methods on objects. Combined with metadata and the common type system, MSIL allows for true cross-language integration. Before code can be executed, MSIL must be converted to CPU-specific code by a JIT compilers. Because the runtime supplies one or more JIT compilers for each computer architecture it supports, the same set of MSIL can be JIT-compiled and executed on any supported architecture.
Maintenance Training Device (MTD)	Full scale replica of an airplane's instruments, equipment, panels, and controls in an open flight deck area or an enclosed airplane cockpit, including the assemblage of equipment and computer software programs necessary to represent the airplane in ground and flight conditions to the extent of the systems installed in the device; does not require a force (motion) cueing or visual system; is found to meet criteria for a specific maintenance training device level; and in which any maintenance training event is accomplished
Multi-Frequency Monitor	A monitor that will allow variable horizontal and vertical sync frequencies. Such a monitor will typically support a large range of video signals. Popularized by NEC when it introduced its Multi-Sync monitor in 1984.
Multi-Media Or Multimedia	Multimedia is the ability to simultaneously present on a single workstation two or more dissimilar media types such as: Audio, still images, computer drawn graphics, motion video, text, and computer animation Normally, the workstation can also capture, manipulate, edit, and store the various media. Multimedia offers access and control through your computer.
Multiprocessing	Using a computer with more than one central processing unit.
Multi-Tasking	The ability of a computer to seemingly perform several tasks concurrently, such as playing a sound effect, moving scenery in the background, and changing the position of an object on the screen in response to user input - all with the appearance of a smooth, seamless operation. Executing several programs or applications simultaneously is multitasking. A computer with a single processing unit can only execute one application's code at a given moment. A multitasking operating system can load and manage the execution of multiple applications, allocating processing cycles to each in sequence. Because of the speed of the computer, it appears that the programs are all operating simultaneously.
Multi-Threaded	A single application can be divided into various tasks or "threads" that run independently of one another. For instance, in a spreadsheet application you might want the recalculation to take place in a separate thread so that you could continue entering data while the spreadsheet recalculates. This is similar in concept to having applications perform tasks like recalculations in the background, except that it's taken care of by the operating system.

N	
National Information Infrastructure	Also known as the Information Superhighway, is envisioned by the US government as a system of telecommunications pathways and connections that transmits and receives voice, video, and data. The pathways consist of copper wire, fiber optic cable, coaxial cable, microwave line-of-sight-signals, and satellite linkages. Currently, parts of this infrastructure exist, and more will be put in place in the next few years as commercial ventures create new networks. Many groups, including nonprofit and public interest organizations, as well as for-profit businesses are developing visions of what the NII should entail. (Source: The National Information Infrastructure: The Federal Role, Updated 14 October 1994)
Natural Language Processing	Executing requests made in English instead of a computer programming language requires natural language processing. Artificial intelligence techniques are used to process phrases, words, and sentences. The context is used to enable the computer to "understand" what is said.
Network	Two or more interconnected computers able to transmit and receive data to and from each other. A hardware and software combination that joins multiple PCs to a server to allow users to share data and peripherals.
Network Server	A computer system used to control a network, including running the network operating system, running shared applications, storing and retrieving data, and performing other network services such as communications, printing, and tape backup. Also referred to as a *server* or *file server*.
Neural Network	A computer architecture or programming that attempts to simulate the physical processing attributes of the human brain. Rather than using a digital model, in which all computations manipulate zeros and ones, a neural network works by creating connections between processing elements, the computer equivalent of neurons. The organization and weights of the connections determine the output. Neural networks are particularly effective for predicting events when the networks have a large database of prior examples to draw on. Strictly speaking, a neural network implies a non-digital computer, but neural networks can be simulated by programming on digital computers.
Node	In Hypertext/hypermedia: Term that refers to a unit of information. Documents are divided into these units (nodes), and the nodes are linked to one another through key words or visual objects that logically connect them. In a Network: A point of interconnection to a network. Normally, a point at which a number of terminals or circuits connect to the network.
National Television Systems Committee (NTSC)	The color television standard used in the United States and Japan. It was created by the National Television Systems Committee. This format uses interlacing for broadcasting images. There are 525 scan lines in one NTSC video picture, or frame. Each half of the frame (the even lines or the odd lines) is called a *field*. Like motion pictures, to provide the illusion of movement, TV signals produce a rapidly presented succession of individual frames (there are 30 frames per second).
O	
Object	In Object Oriented Programming (OOP): A unit of information that consists of attributes (such as color and size) and behaviors (such as draw and move) that manipulate the attributes.

	In CBT: Component of a screen or frame. Simple objects may be categorized as graphics, text, or logic. Graphic and text objects have appearance attributes. Logic objects have behavior attributes. First and lowest hierarchy component. MIL-HDBK-29612-4 Definition 3.2 771 http://www.ott.navy.mil/index.cfm?RID=POL_OT_1000078
Objective	Description of a performance that students are expected to exhibit before being considered competent. Objectives contain the following four components: • Description of the individual(s) who will be expected to perform the objective. • Statement of the expected behavior. • Conditions under which the behavior must be performed. • Standards for acceptable performance.
Objective Hierarchy	Arrangement of objectives in a logical sequence that will aid in identification of the basic instructional units for a training course.
Open Knowledge Initiative. (OKI)	The primary goal of the Open Knowledge Initiative (OKI) is to design and develop an open and extensible architecture for learning management systems (LMS). From this foundation, we hope that OKI will become a community, a process, and an evolving open source toolset. The realization of this primary objective, however, will help us and other contributors to achieve the rest. The Mellon Foundation has funded the first two years of what we expect to be an ongoing effort. MIT leads the project in close collaboration with Stanford. We are joined by a number of key partner institutions that are also playing important roles in defining the OKI architecture, including Dartmouth College, Harvard University, North Carolina State University, University of Michigan, University of Pennsylvania and the University of Wisconsin. The initiative is motivated by the recognition that existing LMS platforms, whether commercial or home-grown, are not very extensible. They do not easily support the development of new educational applications and are difficult to extend into a university's legacy backend infrastructure (authentication/authorization schemes, Registrar's databases or digital library collections.) To correct this problem, OKI's architecture and open source approach is designed to encourage both our partner institutions and eventually a broader educational community to contribute tools and services to OKI's code-base. Like all good architecture, we are designing OKI to be spare and elegant and yet provide the hooks and services that will make it a fertile environment for academic developers. Another goal of OKI is to promote use of this architecture in the development of pedagogical applications (we often refer to these as "tools") that facilitate, among other things, the management of learning content. The OKI project, however, is not about the creation of such content or the population of content repositories. This is important to note because there is some confusion between OKI and another Mellon funded project just getting underway at MIT called the Open Courseware Initiative (OCW). OCW is a content oriented project to make the course materials that are used in the teaching of virtually all of MIT's courses available on the Web, free of charge, to any user anywhere in the world. At MIT, naturally, we are looking to OKI to provided critical pieces of the supporting infrastructure for OCW, but beyond this, the projects are separate. To learn more about the Open Courseware Initiative please visit http://web.mit.edu/ocw/.
Operating System (OS)	Program that, after being initially loaded into the computer by a boot program, manages all the other programs in a computer. The other programs are called *applications* or

	application programs. The application programs make use of the operating system by making requests for services through a defined application program interface (API). In addition, users can interact directly with the operating system through a user interface such as a command language or a graphical user interface (GUI). An operating system performs these services for applications: • In a multitasking operating system where multiple programs can be running at the same time, the operating system determines which applications should run in what order and how much time should be allowed for each application before giving another application a turn. • It manages the sharing of internal memory among multiple applications. • It handles input and output to and from attached hardware devices, such as hard disks, printers, and dial-up ports. • It sends messages to each application or interactive user (or to a system operator) about the status of operation and any errors that may have occurred. • It can offload the management of what are called *batch* jobs (for example, printing) so that the initiating application is freed from this work. • On computers that can provide parallel processing, an operating system can manage how to divide the program so that it runs on more than one processor at a time. All major computer platforms (hardware and software) require and sometimes include an operating system.
P	
Product Assurance (PA)	Ensures that performance and quality of products conform to established company, international, and governmental regulatory standards; agency guidelines; and customer requirements by implementing, overseeing, and maintaining quality assurance programs, policies, processes, procedures, and controls. Administers operational plans or procedures and coordinates with customer and supplier representatives to ensure satisfactory Quality System performance.
Phase Alternate Line (PAL)	The color television system used in much of Europe (Germany, England, Holland, et al, but not France). The initials stand for Phase Alternating Line. The differences between NTSC and PAL are quite technical. However, the perceivable difference is that PAL provides an interlaced format with 625 lines per screen at 25 frames per second, 100 more lines of resolution than NTSC.
Palette	A range of colors from which the on-screen colors may be selected. VGA in 320 by 200 mode supports up to 256 simultaneious colors on screen from a palette of 262,144 possible colors. VGA in 640 by 480 mode allows 16 colors on screen from a palette of 262,144 different colors.
Passive Learning	Level One of interactivity. Learning where no feedback is provided to a user's response. The student acts solely as a receiver of information.
Passive Matrix Display	Type of LCD display technology. Uses one set of transistors for each row and column on the screen. As soon as an LCD element is turned on, it begins to fade. Response times of the LCD elements are also much slower than CRTs and active-matrix displays. This may result in moving-image ghosts, and cursor "submarining" (disappearing during movement.)
Personal Computer (PC)	Term used to refer to a small computer that sits on a desk top and serves a single user. Recently this term has also come to refer to a series of desk top computers made by IBM between 1981 and 1987. These computers, where copied by a large number of other

	manufacturers, called clone makers.
PERSONAL Digital Assistant (PDA)	Term for any small mobile hand-held device that provides computing and information storage and retrieval capabilities for personal or business use, often for keeping schedule calendars and address book information handy. The term handheld is a synonym. Many people use the name of one of the popular PDA products as a generic term. These include Hewlett-Packard's Palmtop and 3Com's PalmPilot. Most PDAs have a small keyboard. Some PDAs have an electronically sensitive pad on which handwritng can be received. Apple's Newton, which has been withdrawn from the market, was the first widely-sold PDA that accepted handwriting. Typical uses include schedule and address book storage and retrieval and note-entering. However, many applications have been written for PDAs. Increasingly, PDAs are combined with telephones and paging systems. Some PDAs offer a variation of the Microsoft Windows operating system called Windows CE. Other products have their own or another operating system.
Personal Home Page Tools (PHP)	In Web programming, PHP (also call PHTML) is a script language and interpreter that is freely available and used primarily on Linux Web servers. Now stands for *PHP: Hypertext Preprocessor*, which the PHP FAQ describes as a "recursive acronym." PHP is an alternative to Microsoft's Active Server Page (ASP) technology. As with ASP, the PHP script is embedded within a Web page along with its HTML. Before the page is sent to a user that has requested it, the Web server calls PHP to interpret and perform the operations called for in the PHP script. An HTML page that includes a PHP script is typically given a file name suffix of ".php" ".php3," or ".phtml". Like ASP, PHP can be thought of as "dynamic HTML pages," since content will vary based on the results of interpreting the script. PHP is free and offered under an open source license.
Pitch	Denotes the horizontal size of a fixed-width font in characters per inch. Also referred to as *character pitch* or *font pitch*.
Pixel	Picture element. The smallest changable unit in an electronic display system. The electronic building block of a picture or text on screen. This corresponds to a single dot or a tiny rectangle. The computer can control a pixel by turning it on or off (simple black and white display), or giving it a color. All graphics and text on screen are made up of pixels. A pixel does not necessarily correspond to a triad of red-green-blue phosphors on a screen. A typical 13" monitor can have 800 or more phosphor triads across the face of its CRT. When connected to a VGA graphics adapter, these can be used to display computer generated images with either 320 or 640 pixels across. One way to measure picture resolution is by the number of pixels used to create images.
Platform Independence	Being able to work on different operating systems and computing hardware without modifications.
Portable Network Graphics (PNG)	Pronounced ping as in ping-pong; is a file format for image compression that, in time, is expected to replace the Graphics Interchange Format (GIF) that is widely used on today's Internet. Owned by Unisys, the GIF format and its usage in image-handling software involves licensing or other legal considerations. (Web users can make, view, and send GIF files freely but they can't develop software that builds them without an arrangement with

	Unisys.) The PNG format, on the other hand, was developed by an Internet committee expressly to be patent-free. It provides a number of improvements over the GIF format. Like a GIF, a PNG file is compressed in lossless fashion (meaning all image information is restored when the file is decompressed during viewing). A PNG file is not intended to replace the JPEG format, which is "lossy" but lets the creator make a trade-off between file size and image quality when the image is compressed. Typically, an image in a PNG file can be 10 to 30% more compressed than in a GIF format. The PNG format includes these features: • You can not only make one color transparent, but you can control the degree of transparency (this is also called "opacity"). • Interlacing (see interlaced GIF) of the image is supported and is faster in developing than in the GIF format. • *Gamma correction* allows you to "tune" the image in terms of color brightness required by specific display manufacturers. • Images can be saved using true color as well as in the palette and gray-scale formats provided by the GIF. Unlike the GIF89a, the PNG format doesn't support animation since it can't contain multiple images. The PNG is described as "extensible," however. Software houses will be able to develop variations of PNG that can contain multiple, scriptable images.
Point	A unit of measure for type equal to approximately 1/72 of an inch
Polymorphism	In Object Oriented Programming (OOP): The ability to perform the same behavior on different kinds of objects. It simplifies software design, since a programmer need only specify a behavior (for example, draw) and elaborate on how it is implemented (for example, curve, line or ellipse).
Prerequisite	A requirement the trainee must possess before being able to attend a training course or lesson. Also called "entry skills."
Profile	Application Profiles provide specific guidance for how to implement meta-data in the SCORM and other environments. They define the mandatory elements and how they are to be encoded to be conformant.
Proxy	An application that acts as an intermediary between other applications.
Proxy Server	In an enterprise that uses the Internet, a proxy server is a server that acts as an intermediary between a workstation user and the Internet so that the enterprise can ensure security, administrative control, and caching service. A proxy server is associated with or part of a gateway server that separates the enterprise network from the outside network and a firewall server that protects the enterprise network from outside intrusion. A proxy server receives a request for an Internet service (such as a Web page request) from a user. If it passes filtering requirements, the proxy server, assuming it is also a cache server, looks in its local cache of previously downloaded Web pages. If it finds the page, it returns it to the user without needing to forward the request to the Internet. If the page is not in the cache, the proxy server, acting as a client on behalf of the user, uses one of its own IP addresses to request the page from the server out on the Internet. When the page is returned, the proxy server relates it to the original request and forwards it on to the user. To the user, the proxy server is invisible; all Internet requests and returned responses appear to be directly with the addressed Internet server. (The proxy is not quite invisible; its IP address has to be specified as a configuration option to the browser or other protocol program.) An advantage of a proxy server is that its cache can serve all users. If one or more

	Internet sites are frequently requested, these are likely to be in the proxy's cache, which will improve user response time. In fact, there are special servers called cache servers. A proxy can also do logging. The functions of proxy, firewall, and caching can be in separate server programs or combined in a single package. Different server programs can be in different computers. For example, a proxy server may in the same machine with a firewall server or it may be on a separate server and forward requests through the firewall.
Part-Task Trainer (PTT)	Device that simulates a part of some sophisticated hardware, such as an airplane. The purpose of the simulation is to allow procedural training - that is training in the operation of the hardware. Because the trainer only simulates a few systems or panels on the hardware, it is incapable of being used to train the entire task of operating the device, hence the name "part task trainer."
Q	
Quality Assurance (QA)	Actions taken by the contractor and/or Government to ensure that supplies and services meet the stated requirements.
Quality Control (QC)	A process of measurement and evaluation used in order to maintain standards.
R	
Redundant Array of Independent Drives (RAID)	A method of organizing disk devices to increase I/O bandwidth and improve data availability. More devices implies more frequent failures. As a result, architectural techniques were developed to provide protection from data loss in RAID systems. There are number of different RAID levels. The three most common are 0, 3, and 5: Level 0: Provides data striping (spreading out blocks of each file across multiple disks) but no redundancy. This improves performance but does not deliver fault tolerance. Level 3: Same as Level 0, but also reserves one dedicated disk for error correction data. It provides good performance and some level of fault tolerance. Level 5: Provides data striping at the byte level and also stripe error correction information. This results in excellent performance and good fault tolerance.
Raster Graphics	A technique for storing a picture for display on a dot oriented device. A raster graphic describes the status of each and every pixel within the bitmap area, line by line. The name comes from the fact that television and most computer displays are raster devices, and also display pictures line by line (raster images). In the simplest case, a black & white graphic, each pixel is described as being either on or off. Higher quality raster graphics can assign multiple levels of gray or colors to each pixel. Part of the challenge in handling raster graphics is the sheer quantity of information they can contain. A 300 dot-per-inch (dpi) black & white scanner must describe 90,000 dots per square inch. Add color or grayscale information and the file sizes can increase dramatically. Raster graphics are typically generated by "paint" programs and scanners. Vector graphics (an alternative way of storing graphics) are generated by "draw" programs and CAD programs. The term raster graphics is synonymous with bit-mapped graphics.
Real Time System	Computer capable of responding to an internal or external event virtually immediately, regardless of the impact on the rest of the system.
Real-Time	Level Four of interactivity. The student is directly involved in a life-like set of complex cues

Participation	and responses.
Real-Time Simulation Presentation	See Category Four of ICW presentation
Refresh Rate	(Vertical Scan Frequency): The number of times per second that the video card and monitor redraw an entire screen. Higher refresh rates produce less flicker. (ref. l) A refresh rate of 60Hz means that the image on the screen is redrawn (or refreshed) 60 times per second. Flicker is seldom discernible at vertical scan frequencies above 50Hz.
Re-Hosted Simulation	Re-hosting the avionics vendor executable code to a simulation architecture with the same or a similar processor.
Reposition:	Moving the aircraft's position from one point to another, for example jumping from TOC to TOD
Resolution	The ability of an image reproducing system to reproduce fine detail. In television, resolution is specified in lines per picture height, which is the total count of black and white lines that can be reproduced in a distance equal to the picture height. On a computer display, resolution is expressed as the number of horizontal pixels and vertical pixels on the screen. Typical resolutions on todays computers are 640 x 480, 1024 x 768, and 1280 x 1024.
Re-Targeted Simulation	Re-targeting the avionics vendor Source Code to a simulation architecture with the same or a similar processor.
Reverse-Engineered Simulation	Reverse-engineering from the aircraft manufacturer or avionics vendor documents. A simulation developed by copying the functionality and operation of actual components
Request For Proposal (RFP)	A formal invitation for offers or to submit a proposal to satisfy a stated Government need.
Red-Green-Blue (RGB)	Refers to one type of signal connecting a graphics adapter to a color monitor. It uses a separate red, green, and blue signal to control the brightness of a particular color. Any color displayed on the monitor is comprised of its RGB components. RGB monitors are frequently subdivided into classes: RGB, RGBI, RGBRGB, and Analog RGB. There are three components to an RGB signal - one for each primary color. Each color component can be either on or off. The total number of colors available with this type of signal is 8. Cyan for instance would be created by the following: red - off, green - on, blue - on.
Router	Software which sequences a series of lessons, tests, and other assignable units in a course. The router determines the order in which the student experiences segments of his computer-based training. One function of a CMI system.
S	
Sharable Content Object (SCO)	Represents a collection of one or more Assets that include a specific launchable asset that utilizes the SCORM Run-Time Environment to communicate with Learning Management Systems (LMSs). A SCO represents the lowest level of granularity of learning resources that can be tracked by an LMS using the SCORM Run-Time Environment.

	To be reusable, a SCO by itself should be independent of learning context. For example, a SCO could be reused in different learning experiences to fulfill different learning objectives. In addition, one or more SCOs can be aggregated to form a higher-level unit of instruction or training that fulfills higher level learning objectives. SCOs are intended to be subjectively small units, such that potential reuse across multiple learning objectives is feasible. The SCORM does not impose any particular constraints on the exact size of a SCO. During content design and authoring activities, when determining the size of a SCO, thought should be given to the smallest logical size of content that one might desire to have tracked by a LMS at run-time. It is intended that the content developer will determine the size of the SCO based on how much information is needed to achieve the learning outcome and on the level of reuse that the content developer wishes to obtain. A SCO can be described with SCO Meta-data
Shareable Content Object Reference Model (SCORM)	An XML-based framework used to define and access information about learning objects so they can be easily shared among different learning management systems (LMSs). SCORM was developed in response to a United States Department of Defense (DoD) initiative to promote standardization in e-learning. The DoD had been frustrated by problems they encountered when trying to share distance learning courses among different learning management systems used within the Department, so in 1997 they formed the Advanced Distributed Learning (ADL) specification group to create a way to make learning content portable across various systems. ADL created the first version of SCORM, which originally stood for Shareable Courseware Object Reference Model. It was designed to facilitate moving course content and related information (such as student records) from one platform to another, to make course content into modular objects that can be reused in other courses, and to enable any LMS to search others for usable course content. The SCORM specifications, which are distributed through the Advanced Distributed Learning (ADL) Initiative Network, define an XML-based means of representing course structures, an application programming interface (API), a content-to-LMS data model, a content launch specification, and a specification for metadata records for all components of a system. The ADL specification group's next challenge is to motivate vendors to comply with SCORM specifications. The Sharable Content Object Reference Model (SCORM™) defines a Web-based learning "Content Aggregation Model" and "Run-time Environment" for learning objects. At its simplest, it is a model that references a set of interrelated technical specifications and guidelines designed to meet DoD's high-level requirements for Web-based learning content.
Screen Capture	Saving a bitmap of the image on a computer screen. This can be done by a software program; no hardware additions are required by the computer. The bitmap is usually saved in the format that can be used by the authoring system that supplies the screen capture. This is not the same as video capture. See also *video capture.*
Secam	A format for television signals used in France, the USSR, Eastern Europe, and other countries. It uses an interlaced image made of 625 lines at 25 frames per second.
Sequence	A part of a CBT lesson where a significant portion of the on-screen image remains unchanged as the lesson progresses. Each student interaction, or lesson activity has visual carry-over from the previous activity.

	Sequences are normally separated by a full-screen erase.
Sequence	A part of a CBT lesson where a significant portion of the on-screen image remains unchanged as the lesson progresses. Each student interaction, or lesson activity has visual carry-over from the previous activity. Sequences are normally separated by a full-screen erase. Third hierarchy component. MIL HDBK Two or more frames forming one visual unit (e.g., motion sequence, still-frame sequence).
Serif	One of the primary classifications of a typeface. Serifs are the brush strokes that cross and embellish the ends of a letter's main strokes. You can usually recognize serif type by the short feet at the bottom of each letter. Times Roman is an example of a font with serifs. Sans serif typefaces lack embellishment on the end of the main strokes and possess lines of nearly equal thickness or weight. Helvetica is a sans serif typeface.
Standard Generalized Markup Language (SGML)	The goal of SGML is to represent the purpose of the data segments marked up. It allows this information to be embedded in a simple text file with plain text. SGML is a descriptive markup, not a *procedural markup* system. This means that using SGML you can mark a string of text as being a chapter heading. However, another outside program then decides how to treat that string and how it should appear on the printout - whether it should be in bold print or italics or a larger font or centered on the page, or indented 6 spaces, etc. Non-textual data, such as graphics, are normally not possible in a text file. However, SGML tagging may indicate a required graphic by referring to an external file containing that graphic. Advantages of SGML tagging include: 1) The intent of the author is preserved through "intelligent tagging." 2) The data is system and device independent -- it is just a simple text file.
Simple Sequencing	The IMS Simple Sequencing Specification defines a method for representing the intended behavior of an authored learning experience such that any learning technology system (LTS) can sequence discrete learning activities in a consistent way. An instructional designer or content developer declares the relative order in which elements of content are to be presented and the conditions under which a piece of content is selected or skipped during presentation. The specification defines the required behaviors and functionality that conforming systems must implement. It incorporates rules that describe the branching or flow of instruction through content according to the outcomes of a learner's interactions with content. This representation of instructional flow conditioned by a learner's interaction with content may be created manually or through the use of authoring systems that conform to this specification. Once created, the representation of sequencing may be interchanged between systems designed to deliver instructional components to learners. Such systems may use special routines or modules to execute the specified rules and behaviors when content is delivered to learners.

	Simple sequencing is labeled as simple because it includes a limited number of widely used sequencing behaviors, not because the specification itself is simple. Simple sequencing is not all-inclusive. In particular, simple sequencing does not address, but does not necessarily preclude, artificial intelligence-based sequencing, schedule-based sequencing, sequencing requiring data from closed external systems and services (e.g., sequencing of embedded simulations), or synchronization between multiple parallel learning activities.
Simulation	The modeling of the system to the extent necessary to provide the functionality required to train in both normal and abnormal procedures
Societe Internationale de Telecommunications Aeronautiques (SITA)	A privately owned international network that serves the aviation community exclusively.
Smart Graphics	(Also known as **SMG**) A graphical object (Typically a cockpit panel or a system page display) which contains all the display capability of the corresponding physical object. A smart graphic should be controlled by CBT applications. Controls should include visible/invisible state, scale, location on the screen, configuration any dynamic components (i.e. switch up/down position, push button on/off/fault state, rotary selector position, ...). A smart graphic should send event to external applications (i.e. mouse click event on push buttons). A smart graphic should remain unique within courseware data. Smart graphics could be used for multipurpose and by a variety of applications (CBT, presentations, simulation, ..).
Subject Matter Expert (SME)	Authority on the information to be taught to a student. Used as a consultant in the design of a CBT program to ensure the accuracy of the content.
Simple Mail Transfer Protocol (SMTP)	A TCP/IP protocol used in sending and receiving e-mail. However, since it's limited in its ability to queue messages at the receiving end, it's usually used with one of two other protocols, POP3 or Internet Message Access Protocol, that let the user save messages in a server mailbox and download them periodically from the server. In other words, users typically use a program that uses SMTP for sending e-mail and either POP3 or IMAP for receiving messages that have been received for them at their local server. Most mail programs such as Eudora let you specify both an SMTP server and a POP server. On UNIX-based systems, sendmail is the most widely-used SMTP server for e-mail. A commercial package, Sendmail, includes a POP3 server and also comes in a version for Windows NT. SMTP usually is implemented to operate over Transmission Control Protocol port 25. The details of SMTP are in Request for Comments 821 of the Internet Engineering Task Force (IETF). An alternative to SMTP that is widely used in Europe is X.400.
Simple Object Access Protocol (SOAP)	A way for a program running in one kind of operating system (such as Windows 2000) to communicate with a progam in the same or another kind of an operating system (such as Linux) by using the World Wide Web's Hypertext Transfer Protocol (HTTP)and its Extensible Markup Language (XML) as the mechanisms for information exchange. Since Web protocols are installed and available for use by all major operating system platforms, HTTP and XML provide an already at-hand solution to the problem of how programs running under different operating systems in a network can communicate with each other. SOAP specifies exactly how to encode an HTTP header and an XML file so that a program in one computer can call a program in another computer and pass it information. It also specifies how the called program can return a response.

	SOAP was developed by Microsoft, DevelopMentor, and Userland Software and has been proposed as a standard interface to the Internet Engineering Task Force (IETF). It is somewhat similar to the Internet Inter-ORB Protocol (IIOP), a protocol that is part of the Common Object Request Broker Architecture (CORBA). Sun Microsystems' Remote Method Invocation (RMI) is a similar client/server interprogram protocol between programs written in Java. An advantage of SOAP is that program calls are much more likely to get through firewall servers that screen out requests other than those for known applications (through the designated port mechanism). Since HTTP requests are usually allowed through firewalls, programs using SOAP to communicate can be sure that they can communicate with programs anywhere.
Snapshot	A record (Dump) of the simulation state variables at a given instant of time that can then be used to reset the simulation to that same state at a later time. The simulation can then be continued from the recorded state.
Source Code	A set of programming language instructions that must be translated to machine instructions before the program can run.
Statement Of Work (SOW)	States the Government's needs in terms of work tasks (e.g., work to be performed in developing or producing the goods to be delivered or services to be performed by a contractor).
Structured Query Language (SQL)	An international (ISO) standard for searching relational databases. It permits users to access data, sometimes simultaneously contained in separate tables. The language includes all arithmetic operations, predicates for comparison and string matching, universal and existential quantifiers, and summary operations for max/min or count/sum.
Stand-Alone	An adjective to describe a computer capable of authoring or delivering CBT with no host or file server connected.
Synthetic Training Device (STD)	See FFS (Full Flight Simulator)
Stimulation	The use of the actual aircraft hardware driven by computer generated signals
Storyboard	A layout and detailed graphic description of a single frame or series of frames, arranged sequentially. The frames describe the action and content of the ICW and specifies all details such as graphics, text, visuals, video, audio, and special effects. It is a graphic depiction that shows the ICW presentation.
Subchapter	In the hierarchy of CBT components: An arbitrary division of a chapter. A grouping of lessons. Training that relates to a single label. Seventh hierarchy component.
Syllabus	An outline arrangement of curriculum segments, modules, lessons, and lesson elements in learning order sequence. Includes the schedule for planned hours, media, methods, and scenario, where applicable.
T	
Target Audience Analysis	Process of determining the entry-level skills or behaviors that students should have prior to entering the course of instruction.
Target Population Description	A profile of potential candidates for the target training program. This description realistically describes target population's entry behavior, current skill and knowledge profile, job history, reading grade level, and other pertinent information.
Task	A single unit of specific work behavior, with clear beginning and ending points, that is

	directly observable or otherwise measurable. A task is performed for its own sake, that is, it is not dependent upon other tasks, although it may fall in a sequence with other tasks in a mission, duty, or job.
Task Analysis	Process of capturing, sorting, and sequencing job tasks in order to determine training requirements.
Task Description	Textual information presented in column, outline, decision table, or timeline format that describes the required job behavior at the highest level of generality. Intended to provide an overview of the total performance.
Transmission Control Protocol/Internet Protocol (TCP/IP)	The basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an intranet or an extranet). When you are set up with direct access to the Internet, your computer is provided with a copy of the TCP/IP program just as every other computer that you may send messages to or get information from also has a copy of TCP/IP. TCP/IP is a two-layer program. The higher layer, Transmission Control Protocol, manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message. The lower layer, Internet Protocol, handles the address part of each packet so that it gets to the right destination. Each gateway computer on the network checks this address to see where to forward the message. Even though some packets from the same message are routed differently than others, they'll be reassembled at the destination. TCP/IP uses the client/server model of communication in which a computer user (a client) requests and is provided a service (such as sending a Web page) by another computer (a server) in the network. TCP/IP communication is primarily point-to-point, meaning each communication is from one point (or host computer) in the network to another point or host computer. TCP/IP and the higher-level applications that use it are collectively said to be "stateless" because each client request is considered a new request unrelated to any previous one (unlike ordinary phone conversations that require a dedicated connection for the call duration). Being stateless frees network paths so that everyone can use them continuously. (Note that the TCP layer itself is not stateless as far as any one message is concerned. Its connection remains in place until all packets in a message have been received.) Many Internet users are familiar with the even higher layer application protocols that use TCP/IP to get to the Internet. These include the World Wide Web's Hypertext Transfer Protocol (HTTP), the File Transfer Protocol (FTP), Telnet (Telnet) which lets you logon to remote computers, and the Simple Mail Transfer Protocol (SMTP). These and other protocols are often packaged together with TCP/IP as a "suite." Personal computer users usually get to the Internet through the Serial Line Internet Protocol (SLIP) or the Point-to-Point Protocol (PPP). These protocols encapsulate the IP packets so that they can be sent over a dial-up phone connection to an access provider's modem. Protocols related to TCP/IP include the User Datagram Protocol (UDP), which is used instead of TCP for special purposes. Other protocols are used by network host computers for exchanging router information. These include the Internet Control Message Protocol (ICMP), the Interior Gateway Protocol (IGP), the Exterior Gateway Protocol (EGP), and the Border Gateway Protocol (BGP).
Test Items	Items designed to measure student performance on a set of objectives (usually course terminal objectives and terminal objectives of course subunits).
Theory	Lesson content describing theory of operation of the aircraft system under discussion.

Instruction	Used to enhance trainee understanding of testing and troubleshooting procedures.
Terminal Learning Objective or Terminal Objective (TLO or TO)	A learning objective at the highest level of learning knowledge, skills and attitudes (KSA) appropriate to the human performance requirements a student will accomplish when successfully completing instruction.
Topic	A logical division of a lesson. An arbitrary grouping of related training into a labeled whole smaller than a lesson. Fourth hierarchy component.
Training Materials	Consists of but is not limited to Instructor Guide, test instruments, Student Handout, transparencies.
Training Skills And Knowledge Tasks	Task listing that identifies physical and/or mental skills and knowledge that are required to achieve desired learning outcomes.
Types Of Learning	Categories of learning that include intellectual skills, verbal information, cognitive strategies, motor skills, and attitudes.
U	
Unified Modeling Language (UML)	A standard notation for the modeling of real-world objects as a first step in developing an object-oriented design methodology. Its notation is derived from and unifies the notations of three object-oriented design and analysis methodologies: • Grady Booch's methodology for describing a set of objects and their relationships • James Rumbaugh's Object-Modeling Technique (OMT) • Ivar Jacobson's approach which includes a *use case methodology* Other ideas also contributed to UML, which was the result of a work effort by Booch, Rumbaugh, Jacobson, and others to combine their ideas, working under the sponsorship of Rational Software. UML has been fostered and now is an accepted standard of the Object Management Group (OMG), which is also the home of Common Object Request Broker Architecture, the leading industry standard for distributed object programming. Vendors of computer-aided software engineering products are now supporting UML and it has been endorsed by almost every maker of software development products , including IBM and Microsoft (for its Visual Basic environment). Martin Fowler, in his book UML Distilled, observes that, although UML is a notation system so that everyone can communicate about a model, it's developed from methodologies that also describe the processes in developing and using the model. While there is no one accepted process, the contributors to UML all describe somewhat similar approaches and these are usually described along with tutorials about UML itself. Among the concepts of modeling that UML specifies how to describe are: class (of objects), object, association, responsibility, activity, interface, use case, package, sequence, collaboration, and state. Fowler's book provides a good introduction to UML. Booch, Rumbaugh, and Jacobson all have or soon will have published the "offficial" set of books on UML.
Uniform Resource Locator (URL)	A universal lacator mechanism for a data set resident anywhere within the Internet's domain.
Unit Of Instruction	Any module, block, and/or lesson that attempts to teach behavioral objectives along with the content needed to perform the objectives.

Universal Description, Discovery, and Integration (UDDI)	An XML-based registry for businesses worldwide to list themselves on the Internet. Its ultimate goal is to streamline online transactions by enabling companies to find one another on the Web and make their systems interoperable for e-commerce. UDDI is often compared to a telephone book's white, yellow, and green pages. The project allows businesses to list themselves by name, product, location, or the Web services they offer. Microsoft, IBM, and Ariba spearheaded UDDI. The project now includes 130 companies, including some of the biggest names in the corporate world. Compaq, American Express, SAP AG, and Ford Motor Company are all committed to UDDI, as is Hewlett-Packard, whose own XML-based directory approach, called e-speak, is now being integrated with UDDI. While the group does not refer to itself as a standards body, it does offer a framework for Web services integration. The UDDI specification utilizes World Wide Web Consortium (W3C) and Internet Engineering Task Force (IETF) standards such as XML, HTTP, and Domain Name System (DNS) protocols. It has also adopted early versions of the proposed Simple Object Access Protocol (SOAP) messaging guidelines for cross platform programming. In November 2000, UDDI entered its public beta-testing phase. Each of its three founders - Microsoft, IBM, and Ariba - now operates a registry server that is interoperable with servers from other members. As information goes into a registry server, it is shared by servers in the other businesses. The UDDI beta is scheduled to end in the first quarter of 2001. In the future, other companies will act as operators of the UDDI Business Registry. UDDI registration is open to companies worldwide, regardless of their size.
User Interface (UI)	See GUI, Graphical User Interface
V	
Vector Graphics	A technique for storing a picture in a computer file. A vector graphic is a mathematical description of each object in a picture so that it can be reproduced on paper or screen. The description of these objects is in terms of lines, shapes (circles, rectangels, etc), and colors, usually using a Cartesian coordinate system for the description. Vector graphics are typically created by draw programs (as opposed to paint programs which create bit maps.)
Vertical Resolution	The specification of resolution in the vertical direction, meaning the ability to reproduce closely spaced horizontal lines. When graphics adapter resolutions are described, the vertical resolution is normally the second figure. A 640 x 480 graphics adapter has a vertical resolution of 480 lines.
Virtual Reality	An environment created by computers, that allows a person to interact with it, or move through and view it. This encompasses a wide range of interfaces. Displaying a model of an object on a computer terminal and allowing a person to rotate the object to view all sides, is a very simple form of virtual reality. Putting on a head set that presents a stereoscopic image, while allowing you to use your hands to manipulate objects in that image, is a far more complex form of virtual reality. A more limited definition would be, "An artificial environment created with computer hardware and software and presented to the user in such a way that it appears and feels like a real environment. To "enter" a virtual reality, a user dons special gloves, earphones, and goggles, all of which receive their input from the computer system. In this way, at least three of the five senses are controlled by the computer. In addition to feeding sensory input to the user, the devices also monitor the user's actions. The goggles, for

	example, track how the eyes move and respond accordingly by sending new video input." This type of virtual reality system requires extremely expensive hardware and software and is confined mostly to research laboratories.
Virtual Reality Modeling Language (VRML)	Pronounced ver-mal, is scene description language that standardizes how three-dimensional environments are represented on the Web. It is sort of a 3-D equivalent of HTML. Files written in VRML have a .wrl extension (short for world). To view these files, you need a VRML browser or a VRML plug-in to a Web browser. Virtual Reality Modeling Language is Unlike programming languages such as "C++", VRML does not have to be compiled and run. Rather, VRML files get parsed and then displayed. The result is a 3-dimensional space that appears on your display screen. And you can figuratively move within this space. That is, as you press keys to turn left, right, up or down, or go forwards or backwards, the images on the screen will change to give the impression that you are moving through a real space. The VRML 2.0 specification was finalized in August, 1996.
W	
Web Services	Sometimes called *application services*, are services (usually including some combination of programming and data, but possibly including human resources as well) that are made available from a business's Web server for Web users or other Web-connected programs. Providers of Web services are generally known as application service providers. Web services range from such major services as storage management and customer relationship management (CRM) down to much more limited services such as the furnishing of a stock quote and the checking of bids for an auction item. The accelerating creation and availability of these services is a major Web trend. Users can access some Web services through a peer-to-peer arrangement rather than by going to a central server. Some services can communicate with other services and this exchange of procedures and data is generally enabled by a class of software known as middleware. Services previously possible only with the older standardized service known as Electronic Data Interchange (EDI) increasingly are likely to become Web services. Besides the standardization and wide availability to users and businesses of the Internet itself, Web services are also increasingly enabled by the use of the Extensible Markup Language (XML) as a means of standardizing data formats and exchanging data. XML is the foundation for the Web Services Description Language (WSDL). As Web services proliferate, concerns include the overall demands on network bandwidth and, for any particular service, the effect on performance as demands for that service rise. A number of new products have emerged that enable software developers to create or modify existing applications that can be "published" (made known and potentially accessible) as Web services.
Web Services Conversation Language (WSCL)	A simple conversation language standard that can be used for various Web-service protocols and frameworks. It focuses on modeling the sequencing of the interactions or operations of one interface and fills the gap between mere interface definition languages that do not specify any choreography and more complex process or flow languages that describe complex global multi-party conversations and processes." The Web Services Conversation Language "allows the abstract interfaces of Web services, *i.e.*, the business

	level conversations or public processes supported by a Web service, to be defined. WSCL specifies the XML documents being exchanged, and the allowed sequencing of these document exchanges. WSCL conversation definitions are themselves XML documents and can therefore be interpreted by Web services infrastructures and development tools. WSCL may be used in conjunction with other service description languages like WSDL; for example, to provide protocol binding information for abstract interfaces, or to specify the abstract interfaces supported by a concrete service."
Web Services Description Language (WSDL)	An XML-based language used to describe the services a business offers and to provide a way for individuals and other businesses to access those services electronically. WSDL is the cornerstone of the Universal Description, Discovery, and Integration (UDDI) initiative spearheaded by Microsoft, IBM, and Ariba. UDDI is an XML-based registry for businesses worldwide, which enables businesses to list themselves and their services on the Internet. WSDL is the language used to do this. WSDL is derived from Microsoft's Simple Object Access Protocol (SOAP) and IBM's Network Accessible Service Specification Language (NASSL). WSDL replaces both NASSL and SOAP as the means of expressing business services in the UDDI registry.
What You See Is What You Get (WYSIWYG)	This expression refers to the display on a computer monitor and its relationship to the appearance of the same information on paper. A WISIWYG system will provide a screen display that closely resembles the hardcopy version of the information. WYSIWYG is most commonly used to refer to word processing systems, but may also be used to describe desk top publishing software and even graphics packages.
Wide Area Network (WAN)	A geographically dispersed telecommunications network. The term distinguishes a broader telecommunication structure from a local area network (). A wide area network may be privately owned or rented, but the term usually connotes the inclusion of public (shared user) networks. An intermediate form of network in terms of geography is a metropolitan area network (MAN).
World Wide Web Consortium (W3C)	The (W3C) describes itself as follows: "The World Wide Web Consortium exists to realize the full potential of the Web. The W3C is an industry consortium which seeks to promote standards for the evolution of the Web and interoperability between WWW products by producing specifications and reference software. Although W3C is funded by industrial members, it is vendor-neutral, and its products are freely available to all. The Consortium is international; jointly hosted by the MIT Laboratory for Computer Science in the United States and in Europe by INRIA who provide both local support and performing core development. The W3C was initially established in collaboration with CERN, where the Web originated, and with support from DARPA and the European Commission." Organizations may apply for membership to the Consortium; individual membership isn't offered. The W3C has taken over what was formerly called the CERN Hypertext Transfer Protocol daemon or Web server.
World Wide Web	A wide-area hypermedia information retrieval initiative giving access to a large universe of information WWW has made the Internet navigable, where it was not before, except in the most occult and hermetic manner. Furthermore, it added a universal organization to the data within it; through WWW, the millions of Internet host computers can be treated as a single, unified data source, and all of the data can be treated as a single, albeit complexly structured, document.

X	
Extensible Hypertext Markup Language (XHTML)	As the World Wide Web Consortium (W3C) describes it, XHTML () is "a reformulation of HTML 4.0 as an application of the Extensible Markup Language (XML)." For readers unacquainted with either term, HTML is the set of codes (that's the "markup language") that a writer puts into a document to make it displayable on the World Wide Web. HTML 4 is the current version of it. XML is a structured set of rules for how one might define any kind of data to be shared on the Web. It's called an "extensible" markup language because anyone can invent a particular set of markup for a particular purpose and as long as everyone uses it (the writer and an application program at the receiver's end), it can be adapted and used for many purposes - including, as it happens, describing the appearance of a Web page. That being the case, it seemed desirable to reframe HTML in terms of XML. The result is XHTML, a particular application of XML for "expressing" Web pages. XHTML is, in fact, the follow-on version of HTML 4. You could think of it as HTML 5, except that it is called XHTML 1.0. In XHTML, all HTML 4 markup elements and attributes (the language of HTML) will continue to be supported. Unlike HTML, however, XHTML can be extended by anyone that uses it. New elements and attributes can be defined and added to those that already exist, making possible new ways to embed content and programming in a Web page. In appearance, an XHTML file looks like a somewhat more elaborate HTML file.
Extensible Markup Language (XML)	Designed to improve the functionality of the Web by providing more flexible and adaptable information identification. It is called extensible because it is not a fixed format like HTML (a single, predefined markup language). Instead, XML is actually a metalanguage' --a language for describing other languages--which lets you design your own customized markup languages for limitless different types of documents. XML can do this because it's written in SGML, the international standard metalanguage for text markup systems (ISO 8879). **XML-DTD**- A DTD is a formal description in XML Declaration Syntax of a particular type of document. It sets out what names are to be used for the different types of element, where they may occur, and how they all fit together. For example, if you want a document type to be able to describe Lists which contain Items, the relevant part of your DTD might contain something like this: <!ELEMENT List (Item)+> <!ELEMENT Item (#PCDATA)>This defines a list as an element type containing one or more items (that's the plus sign); and it defines items as element types containing just plain text (Parsed Character Data or PCDATA). Validating parsers read the DTD before they read your document so that they can identify where every element type ought to come and how each relates to the other, so that applications which need to know this in advance (most editors, search engines, navigators, databases) can set themselves up correctly. The example above lets you create lists like: <List><Item>Chocolate</Item><Item>Music</Item><Item>Surfing</Item></List> How the list appears in print or on the screen depends on your stylesheet: you do not normally put anything in the XML to control formatting like you had to do with HTML before stylesheets. This way you can change style easily without ever having to edit the document itself. A DTD provides applications with advance notice of what names and structures can be used in a particular document type. Using a DTD when editing files means you can be certain that all documents which belong to a particular type will be constructed and named in a consistent and conformant manner. DTDs are less important for processing documents already known to be well-formed, but they are still needed if you want to take advantage of XML's special attribute types like the built-in ID/IDREF cross-reference mechanism. There are thousands of DTDs already in existence in all kinds of areas (see the SGML/XML Web pages for pointers). Many of them can be downloaded and used freely. Existing SGML

	DTDs need to be converted to XML for use with XML systems. **XML-Schema -** A DTD is for specifying the structure (only) of an XML file: it gives the names of the elements, attributes, and entities that can be used, and how they fit together. Because DTDs were designed for use with traditional text documents, they have no mechanism for defining the content of elements in terms of data types, because XML has no data types: text is just text. A DTD therefore cannot be used to specify numeric ranges or to define limitations or checks on the text content, only on the markup that surrounds it. The XML Schema recommendation provides a means of specifying element content in terms of data types, so that document type designers can provide criteria for validating the content of elements as well as the markup itself. Schemas are written as XML files, thus avoiding the need for processing software to be able to read XML Declaration Syntax, which is different from XML Instance Syntax.
Extensible Rights Markup Language ™ (XrML)	The is a general-purpose, XML based-specification grammar for expressing rights and conditions associated with digital content, resources, and services. The goal of XrML is to expand the usefulness of digital content, resources, and serverices to rights holders and users by providing a flexible, extensible, and interoperable industry standard language that is platform, media, and format independent.
XML Schema Definition (XSD)	A recommendation of the World Wide Web Consortium (W3C), specifies how to formally describe the elements in an Extensible Markup Language (XML) document. This description can be used to verify that each item of content in a document adheres to the description of the element in which the content is to be placed. In general, a schema is an abstract representation of an object's characteristics and relationship to other objects. An XML schema represents the interrelationship between the attributes and elements of an XML object (for example, a document or a portion of a document). To create a schema for a document, you analyze its structure, defining each structural element as you encounter it. For example, within a schema for a document describing a Web site, you would define a Web site element, a Web page element, and other elements that describe possible content divisions within any page on that site. Just as in XML and HTML, elements are defined within a set of tags. XSD has several advantages over earlier XML schema languages, such as document type definition (DTD) or Simple Object XML (SOX). For example, it's more direct: XSD, in contrast to the earlier languages, is written in XML, which means that it doesn't require intermediary processing by a parser. Other benefits include self-documentation, automatic schema creation, and the ability to be queried through XML Transformations (XSLT). Despite the advantages of XSD, it has some detractors who claim, for example, that the language is unnecessarily complex.
Extensible Stylesheet Language Transformations (XSLT)	A standard way to describe how to transform (change) the structure of an XML (Extensible Markup Language) document into an XML document with a different structure. XSLT is a Recommendation of the World Wide Web Consortium (W3C). XSLT can be thought of as an extension of the Extensible Stylesheet Language (XSL). XSL is a language for formatting an XML document (for example, showing how the data described in the XML document should be presented in a Web page). XSLT shows how the XML document should be reorganized into another data structure (which could then be presented by following an XSL style sheet). XSLT is used to describe how to transform the *source tree* or data structure of an XML document into the *result tree* for a new XML document, which can be completely different in structure. The coding for the XSLT is also referred to as a style sheet and can be combined with an XSL style sheet or be used independently.
Y	

Z	

Appendix A

Procedure for Update

Source of changes

The definitions in this document represent the agreement of the AICC Courseware Technology Subcommittee members. Suggested updates -- changes to existing definitions or new definitions -- may be submitted by anyone. These changes are normally inserted by the document editor.

Change consideration

At every Courseware Technology Subcommittee meeting, all suggested changes are brought to the attention of the membership in one of two ways.

1) The new changed document is passed out to the membership with the changes highlighted by revision bars, or

2) The changes which the document editor did not include are passed out on separate pages.

Explicit approvals

At the meeting any changes may be discussed and approved or rejected by a vote of the subcommittee members present. Any changes to this document that are not discussed or approved are conditionally assumed to be part of the document.

At any time before the next meeting -- meetings take place at about three month intervals -- items not previously discussed are open to comment. Any comments submitted to the editor by fax, letter, or phone will either be incorporated or made an agenda item for discussion at the next meeting.

Implied approvals

Any new items that were not commented upon during the interval between meetings become a part of the document at its next release. That is the revision bars will disappear and it will become a recommended AICC definition.

Current editor

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APPENDIX B

Acronym	AICC Definition
.NET	.NET is both a business strategy from Microsoft and its collection of programming support for what are known as Web services, the ability to use the Web rather than your own computer for various services.
ActiveX	ActiveX is the name Microsoft has given to a set of object-oriented programming technologies and tools.
ADL	Advanced Distributed Learning.
ADO	ActiveX Data Objects
ADO.NET	ADO data access system
AECMA	Association Europeenne Constructeurs Materiel Aerospatial.
AGR	AICC Guidelines and Recommendations
AIA	Aerospace Industries Association
AICC	Aviation Industry CBT Committee
API	Application Program Interface (and sometimes spelled *application programming interface)*
Ariadne	The Alliance of Remote Instructional Authoring & Distribution Networks for Europe
ASP	Active Server Page
ASP.NET	ASP.NET (also called ASP+), is the next generation of Microsoft's Active Server Page (ASP)
ATA	Air Transport Association. Group of North American airlines that creates guidelines.
ATM	Asynchronous Transfer Mode
C#	C# (pronounced "C-sharp") is a new object-oriented programming language from Microsoft
C++	C++ is an object-oriented programming (OOP)
CAI	Computer-Aided Instruction. Sometimes Computer-assisted Instruction.
CBT	Computer-Based Training
CGI	Common Gateway Interface
CGM	Computer Graphics Metafile
CM	Configuration Management
CMI	Computer-Managed Instruction
COM	Component Object Model
CSF	Content Structure File
DBMS	Database Management System
DCOM	Distributed Component Object Model
Deprecated	Deprecated means tolerated but not recommended
DNS	Domain Name System
DLL	Dynamic Link Library
EPSS	Electronic Performance Support System
ELO Or EO	Enabling Learning Objective or Enabling Objective
FDDI	Fiber-Optic Digital Device Interface
FBS	Fixed-Base Simulator
FNPT	Flight Navigation Procedure Trainer
FTD	Flight Training Device
FS	Fixed-Base Simulator
FSEMC	
FFS	Full Flight Simulator
GUI	Graphical User Interface
HACP	
HDTV	High Definition TeleVision
HRMS	Human Resources Management System
HTML	Hyper-Text Markup Language
HTTP	Hypertext Transfer Protocol
I/O	Input/output
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ID	Instructional Designer
IEEE	Institute of Electrical and Electronics Engineers

AICC Acronyms

Acronym	AICC Definition
IETM	Interactive Electronic Technical Manual
ILT	Instructor Led Training.
IMI	Interactive Multimedia Instruction
IMS	Instructional Management System Global Consortium
ISDN	Integrated Services Digital Network
ICW	Interactive Courseware
ISD	Instructional Systems Design
ISO	International Standards Organization
J2EE	Java 2 Platform, Enterprise Edition, a Java platform designed for the mainframe-scale computing A
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
JPEG	Joint Photographic Experts Group
JSP	Java Server Page
LAN	Local Area Network
Laser	Light Amplification by Stimulation of Emission of Radiation
LCD	Liquid Crystal Display
LCMS	Learning Content Management System
LMS	Learning Management System
LOM	Learning Object Metadata.
MTD	Maintenance Training Device
Metadata	Metadata describes relevant characteristics of the learning object to which it applies.
MIME	Multipurpose Internet Mail Extension
MIPS	Millions of Instructions Per Second
MPEG	Moving Picture Experts Group standard for digital video
MSIL	Microsoft Intermediate Language
NTSC	National Television Systems Committee. The color television standard used in the United States and Japan
OKI	Open Knowledge Initiative
OS	Operating System
PA	Product Assurance
PAL	Phase Alternate Line. The color television system used in much of Europe not France.
PTT	Part-Task Trainer
PC	Personal Computer
PDA	Personal Digital Assistant
PHP	Also call PHTML, a script language and interpreter that is freely available and used primarily on Linux Web servers. PHP, originally derived from *Personal Home Page* Tools, now stands for *PHP: Hypertext Preprocessor*.
PNG	Pronounced ping for Portable Network Graphics, is a file format for image compression
RAID	Redundant Array of Independent Drives
RFP	Request For Proposal
RGB	Red-Green-Blue
SCO	A Sharable Content
SCORM	Shareable Content Object Reference Model
SGML	Standard Generalized Markup Language
SITA	Societe Internationale de Telecommunications Aeronautiques. A privately owned international network that serves the aviation community exclusively.
Smart Graphics	(Also known as SMG) A graphical object (typically a cockpit panel or a system page display) which contains all the display capability of the corresponding physical object.
SME	Subject Matter Expert.
SMTP	Simple Mail Transfer Protocol
SOAP	Simple Object Access Protocol is a way for a program running in one kind of operating system (e.g., Windows 2000) to communicate with a program in the same or another kind of an operating system (e.g., Linux)
SOW	Statement Of Work
SQL	Structured Query Language

Acronym	AICC Definition
STD	Synthetic Training Device
TCP/IP	Transmission Control Protocol/Internet Protocol
TLO or TO	Terminal Learning Objective or Terminal Objective
UDDI	Universal Description, Discovery, and Integration is an XML-based registry for businesses worldwide to list themselves on the Internet.
UI	User Interface
UML	Unified Modeling Language
URL	Uniform Resource Locator
VRML	Pronounced ver-mal, and short for Virtual Reality Modeling Language
W3C	World Wide Web Consortium
WAN	Wide Area Network
WSCL	Web Services Conversation Language is a simple conversation language standard that can be used for various Web-service protocols and frameworks.
WSDL	Web Services Description Language (WSDL) is an XML-based language used to describe the services a business offers and to provide a way for individuals and other businesses to access those services electronically.
WYSIWYG	What You See Is What You Get
XHTML	Extensible Hypertext Markup Language
XML	Extensible Markup Language
XML-DTD	A DTD is a formal description in XML Declaration Syntax of a particular type of document
XML-Schema	A DTD is for specifying the structure (only) of an XML file
XRML	The eXtensible rights Markup Language
XSD	XML Schema Definition
XSLT	Extensible Stylesheet Language (XSL) Transformations (XSLT) is a standard way to describe how to transform (change) the structure of an XML document into an XML document with a different structure.