

## Supportive Learning: Linear Learning and Collaborative Learning

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### ABSTRACT

This is a conceptual paper which is trying to look at the educational technology is not limited to high technology. However, electronic educational technology, also known as e-learning, has become an important part of today's society, which consists of a wide variety of approaches to digitization, components and methods of delivery. In the literature, researchers used narrative literature review to describe the current states of both art (i.e., practice) and science (i.e., research) in focused areas of inquiry. Researchers collect all the important points of discussion, and synthesis them here with reference to the specific field where this paper is originally based on. The findings show that Computer-based training (CBT) initially delivered content via CD-ROM, and is usually presented linear content, much like reading an online book or manual. Computer supported collaborative learning (CSCL) use teaching methods that are designed to encourage or require students to engage in learning tasks. CSCL is similar in concept to the term, "collaborative learning network", "e-learning 2.0" and (NCL).

**Keywords:** Supportive Learning, Linear Learning, Collaborative Learning

### INTRODUCTION

Educational technology is the effective use of technology tools in learning. As a concept, it involves a wide range of devices, such as media, machines and network equipment, as well as the underlying theoretical perspectives for effective application (Richey, 2008; D. Randy and Terry, 2003).

Educational technology is not limited to high technology (D. Randy Garrison and Terry Anderson, 2003). However, electronic educational technology, also known as e-learning, has become an important part of today's society, which consists of a wide variety of approaches to digitization, components and delivery methods (Selwyn, 2011). For example, m-learning emphasizes movement, but otherwise indistinguishable in principle from educational technology (Moore, Dickson-Deane, Galyen, 2011).

Educational technology includes a wide range of media that delivers text, audio, images, animation and video streaming, and includes applications such as technology and process audio or video tape, satellite TV, CD-ROM, and computer-based learning, as well as local intranet / extranet and web-based learning. Information and communication systems, either alone or by either the local network or the Internet in the learning network, underlies much of the e-learning (Tavangarian, Leypold, Nolting, Roser, 2004).

Theoretical perspectives and scientific testing affect instructional design. Use theories of human behavior to derive the input of technology education teaching theory, learning theory, educational psychology, media psychology and human performance technology.

Educational technology and e-learning can take place inside or outside the classroom. It can be self-directed, asynchronous learning or instructor-led it, synchronous learning. It is ideal for distance learning and, together with face-to-face learning, called blended learning. Educational technology is used by students and educators in homes, schools (both K-12 and higher education), business, and other settings.

## **METHOD**

Researchers collect all the important points of discussion, and synthesis them here with reference to the specific field where this paper is originally based on.

## **LINEAR LEARNING**

Computer-based training (CBT) refers to independent learning activities are sent to a computer or handheld device such as a tablet or smartphone. CBT content initially delivered via CD-ROM, and is usually presented linear content, much like reading an online book or manual. For this reason, CBT is often used to teach static processes, such as using software or completing mathematical equations. Computer-based training is a concept similar to the web-based training (WBT) sent over the Internet using a web browser.

Assessing learning in a CBT frequently by assessments that can be easily scored by a computer such as multiple-choice questions, drag-and-drop, radio button, simulation or other interactive means. Rating easily scored and recorded via online software, providing immediate feedback to end users and ready status. Users are often able to print completion records in the form of a certificate.

CBTs stimulate learning outside traditional learning methodology from textbook, manual, or classroom-based instruction. CBTs can be a good alternative for learning materials printed since rich media, including videos or animations, can be embedded to enhance the learning process.

However, CBTs pose some learning challenges. Usually, the creation of effective CBTs requires substantial resources. The software for developing CBTs (such as Flash or Adobe Director) is more complex than a subject matter expert or teacher can use. The lack of human interaction can limit both the type of content that can be presented and type of assessment can be done, and may need to supplement with online discussion or other interactive elements.

The computer is a general purpose tool that can be programmed to carry out a set of arithmetic or logic operations automatically. Because the order of operations can be easily changed, the computer can solve more than one problem.

Conventionally, the computer comprises at least one processing element, typically a central processing unit (CPU), and some forms of memory. Processing elements perform arithmetic and logical operations and sequencing and control unit can change the order of operations in response to the information stored. Peripheral devices allow information to be retrieved from an external source, and results of operations are stored and retrieved.

Mechanical analog computer began to appear in the first century and was used in medieval era for astronomical calculations. In World War II, a mechanical analog computer was used for special military applications such as counting torpedo target. At this time the first electronic digital computer was developed. Originally they were the size of a large room, consuming as much power as several hundred modern personal computers (PC) (Fuegi, and Francis, (2003).

Modern computers based on integrated circuits are millions to billions of times more capable than the earliest computer, and occupies a fraction of the space (Kempf, 1961). Computer is small enough to fit in your mobile device, and mobile computers can be powered by a small battery. Personal computers in various forms are icons of the Information Age and is generally regarded as "computer". However, the embedded computers found in many devices from MP3 players to fighter aircraft and from electronic toys to industrial robots are the most numerous.

The Internet is a global system of interconnected computer networks that use Internet protocol suite (TCP/IP) to connect billions of devices worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks of local to global scope, which is associated with a broad array of electronic, wireless and optical networking technologies. Internet brings a wide range of information resources and services, such as documents concerning the application of hypertext and the World Wide Web (WWW), e-mail, phone, and peer-to-peer network to share files.

Although Internet protocol suite has been widely used by academics and the military industrial complex since the early 1980s, the events of the late 1980s and 1990s as more powerful computers and more affordable, the arrival of the optical fiber, the popularization of HTTP and Web browsers and a push towards open technologies for trading services and technology ultimately incorporated into almost every aspect of contemporary life.

The origins of the Internet dates back to the research and development carried out by the United States, United Kingdom and France in 1960 to build robust, fault-tolerant communication via computer networks (IPTO, 2000). The work, led to a major pioneer network, ARPANET, the United States, Mark 1 network coverage in the United Kingdom and the Cyclades in France. The connection of regional academic network in 1980 marked the beginning of the transition to the modern Internet (Ian, 2014). From 1980 onwards, the network experienced exponential growth as the generation of maintaining institutional, personal, and portable computer is connected to.

Internet usage is growing rapidly in the West from the mid-1990s and the late 1990s in developing countries. In the 20 years since 1995, Internet use has grown 100 times, measured for a period of one year, more than one third of the world population (World Stats, 2012).

Most traditional communications media, such as telephone and television, are reshaped or redefined by the Internet, the birth of new services such as mobile Internet and Internet television. Newspapers, books, and other printed publications adapting to Web site technology, or are reshaped into blogging and web feeds. The entertainment industry was initially the fastest growing segments on the Internet. Internet has enabled and accelerated new forms of personal interaction through instant messaging, Internet forums, and social networks. Shopping online has grown tremendously for both major retailers and small traders and artisans. Business-to-business financial services in the Internet affect supply chains across entire industries.

Internet has no centralized governance in either implementation or policies for access and use of technology; each constituent network sets its own policies (Strickland, 2014). Only the overreaching definitions of the two principal name spaces in the Internet, the Internet Protocol address space and the Domain Name System (DNS), directed by the organization, the Internet Corporation for Assigned Names and Numbers (ICANN). Which is the basis of technical and standardization of the core protocols of the Internet Engineering Task Force (IETF), a non-profit organization loosely affiliated international participants that anyone may associate with by contributing technical expertise (Hoffman and Harris, 2006).

## **WORLD WIDE WEB**

Many people use the terms Internet and World Wide Web, or simply Web, interchangeably, but the two terms are not synonymous. World Wide Web is the main application that billions of people use the Internet, and it has changed the lives of those who are far (Pew Research Center, 2015). However, the Internet provides many other services. Web is a global set of documents, images and other resources, logically interrelated by hyperlinks and referenced with a Uniform Resource Identifier (URI). URI symbolically identify services, servers and other databases, and documents and resources that they can provide. Hypertext Transfer Protocol (HTTP) is the main access protocol of the World Wide Web. Web services also use HTTP to allow software systems to communicate in order to share and exchange business logic and data.

World Wide Web browser software, such as Microsoft Internet Explorer, Mozilla Firefox, Opera, Apple Safari and Google Chrome, let users navigate from one site to another via hyperlinks embedded in the document. These documents may also contain any combination of computer data, including graphics, sound, text, video, multimedia and interactive content that runs while the user interacts with the page. The client software can include animation, games, office applications and scientific demonstrations. Through a search engine keyword-driven Internet research using as Yahoo! and Google, users worldwide have easy, instant access to a huge amount and variety of information online. Compared to print media, books, encyclopedias and traditional libraries, the World Wide Web has enabled the distribution of information on a large scale.

The Web has also enabled individuals and organizations to publish ideas and information to a potentially large audience online with reduced expense and time delays. Publishing web site, blog, or building a website involves little initial cost and many of the services are provided. However, publishing and maintaining large, professional web sites with attractive, diverse and up-to-date information is still a difficult and expensive proposition. Many individuals and some companies and groups use web logs or blogs, which are largely used as online diaries easily updatable. Some commercial organizations encourage staff to communicate advice in their area of specialization in the hope that visitors will be impressed by the expert knowledge and free information, and attracted to the corporation as a result.

One example of this practice is Microsoft, whose product developers publish their personal blogs in order to attract people to their work. [Original research?] The collection of personal web pages published by large service providers remain popular and have become increasingly sophisticated. Whereas operations such as Angelfire and GeoCities have existed since the early days of the Web, newer offerings from, for example, Facebook and

Twitter now has a large number of followers. These operations often brand themselves as social network service and not only as a host site.

Advertising on popular web pages can be lucrative, and e-commerce or sale of products and services directly through the site continues to grow.

If the site developed in the 1990s, the site regularly kept in the form completed by the web server, are formatted in HTML, complete to be sent to the web browser in response to the request. Over time, the process of creating and serving web pages has become a dynamic, creating a flexible design, layout, and content. Websites are often created using content management software with, initially, very little content. Contributors to this system, which can be paid staff, members of the organization or the public, fill underlying databases with content using editing pages designed for that purpose, while visitors view and read this content in the form of HTML. There may or may not be editorial, approval and security systems built into the process of taking a new content in and make it available to the target visitors.

### **COMMUNICATION**

E-mail is an important communications service available on the Internet. The concept of sending electronic text messages between parties in the same way with the letter of correspondence or memos predates the creation of the Internet. Pictures, documents, and other files sent as e-mail attachments. E-mails can be cc-ed to multiple email addresses.

Internet telephony is another common communications service made by the creation of the Internet. VoIP stands for Voice-over-Internet Protocol (VoIP), referring to the protocol that underlies all Internet communication. The idea began in the early 1990s with walkie-talkie voice applications such as personal computers. In recent years, many VoIP systems have become as easy to use and as easy as a regular phone. The benefit is that, as the Internet carries voice traffic, VoIP can be free or much cheaper than traditional phone calls, especially over long distances and especially for those who always have an Internet connection such as cable or ADSL. VoIP matured into a competitive alternative to traditional telephone services. Interoperability between different providers has improved and the ability to call or receive calls from traditional phone available. Simple, inexpensive VoIP network adapters are available that eliminate the need for a personal computer.

Voice quality can still vary from call to call but is often equal to and can even exceed that of traditional calls. Remaining problems for VoIP include emergency telephone number dialing and reliability. At present, some VoIP providers provide an emergency service, but it is not universal. Old traditional phones with no "extra features" might just power line and operate during a power failure; VoIP cannot do so without a backup power source for the phone equipment and Internet access devices. VoIP has also become increasingly popular for gaming applications, as a form of communication between players. Popular VoIP clients for gaming include Ventrilo and TeamSpeak. Modern video game consoles also offer VoIP chat features.

### **DATA TRANSFER**

File sharing is an example of transferring large amounts of data on the Internet. Computer files can be emailed to clients, colleagues and friends as an attachment. It can be uploaded to a website or file transfer protocol (FTP) server for easy download by others. It can be put into a "shared location" or onto a file server for instant use by colleagues. Load download bulk to many users can be eased by using a "mirror" servers or peer-to-peer network. In any of these cases, access to files that can be controlled by user authentication, transit files over the Internet can be obscured by encryption, and money may change hands for access to the file. The price may be paid by charging much funds from, for example, a credit card whose details are also passed - usually fully encrypted - on the Internet. The origin and authenticity of the file received may be checked by digital signatures or MD5 or other message digests. This feature is easy to Internet, more globally, changing the production, sale, and distribution of anything that can be reduced to a computer file for transmission. This includes all forms of print publications, software products, news, music, film, video, photography, graphics and other art. This in turn has led to seismic changes in the existing industries that previously controlled the production and distribution of these products.

Streaming media is the delivery of real-time digital media for immediate use or enjoyment by the end user. Many radio and television broadcasters provide Internet audio and video feeds of their lives. They may also allow time-shift viewing or listening such as Preview, Classic Clips and Listen Again features. Providers have been accompanied by a variety of pure Internet "broadcasters" who never had a license into the air. This means that the device connected to the Internet, such as a computer or something more specific, can be used to access online media in much the same way as previously possible only with a television or radio receiver. A wide range of

existing content is wider, from specialized technical webcasts to on-demand popular multimedia services. Podcasting is a variation on this theme, in which - usually audio - material is downloaded and played back on a computer or shifted to a portable media player to hear the motion. These techniques using simple equipment allow anybody, with little censorship or licensing control, to broadcast audio-visual material worldwide. Model live media increase the demand for network bandwidth. For example, the image quality standard requires 1 Mbit / s link speeds for SD 480p, 720p HD quality requires 2.5 Mbit / s, and the quality HDX top-of-the-line requires 4.5 Mbit / s for 1080p (Morrison, 2010).

Webcam is a continued low cost of this phenomenon. While some webcams can give full-frame-rate video, the picture is usually either small or updates slowly. Internet users can watch animals around an African waterhole, ships in the Panama Canal, traffic at a local roundabout or monitor their own premises, live and in real time. Video chat rooms and video conferencing are also popular with many uses being found for personal webcams, with and without two-way sound. YouTube was founded on 15 February 2005 and is now leading website for free streaming video with a large number of users. It uses a flash-based web player to stream and show video files. Registered users can upload unlimited videos and build their own personal profile. YouTube claims that its users watch hundreds of millions, and upload hundreds of thousands of videos daily. At this time, YouTube also uses HTML5 player (YouTube Fact Sheet, 2009).

Web browser (usually referred to as a browser) is a software application for retrieving, presenting, and traversing information resources on the World Wide Web. Resource information identified by Resource Identifier (URI/URL) uniform and can be web pages, images, video or other piece of content (Jacobs & Walsh, 2004). Hyperlinks in resources that allow users to easily navigate their browsers to related resources.

Although browsers are primarily intended to use the World Wide Web, they also can be used to access information provided by Web servers in private networks or files in the file system.

The major web browsers are Firefox, Internet Explorer / Microsoft Edge (Fitzpatrick, 2009), Google Chrome, Opera, and Safari.

## **FUNCTION**

The main purpose of a web browser is to bring information resources to users ("recover" or "fetching"), which allows them to view information ("Display", "give"), and then access other information ("cruise", "The following links").

The process starts when a user inputs a Uniform Resource Locator (URL), for example <http://en.wikipedia.org/>, into the browser. URL prefix, the Uniform Resource Identifier or URI, specifying how it will be interpreted. The most commonly used type of URI starts with [http:](http://) and identifies a resource to be taken on the Hypertext Transfer Protocol (HTTP) (Browser Information, 2012). Many browsers also support a variety of other prefixes, such as [https](https://) .: for HTTPS, [ftp](ftp://) : for File Transfer Protocol, and files: local files. Prefix that web browsers can not directly handle are often handed off to another application entirely. For example, <mailto:> URI usually left to the default e-mail application users, and <news:> URIs passed to the default newsgroup reader users.

In the case of [http](http://), [https](https://), [file](file://), and others, when the resource is taken web browser will display it. HTML and related content (images, files, format information such as CSS, etc.) approved for browser layout engine to change from markup to an interactive document, a process known as "performances". Aside from HTML, web browsers can generally display any kind of content that can be part of the site. Most browsers can display images, audio, video, and XML files, and often have plug-in to support Flash applications and Java applets. When encountering unsupported file types or files are set to be downloaded from the display, the browser prompts the user to save the file to disk.

Sources of information may contain links to other information sources. Each link contains the URI of the resource to go to. When the link is clicked, the browser navigate to the source indicated by the link target URI, and the process of bringing content to the user begins again.

## **FEATURES**

Web browsers are available in a wide range of features from minimal, text-based user interface with a bare-bones support for HTML to rich user interface that supports a variety of file formats and protocols. Browsers include additional components to support e-mail, Usenet news and Internet Relay Chat (IRC), sometimes referred to as the "Internet suite" rather than mere "web browser" (Mozilla Foundation, 2008).



All major web browsers allow the user to open multiple information resources simultaneously, either in a different browser window or tab different the same window. Major browsers also include pop-up blockers to prevent unwanted windows from "popping up" without the user's consent (Andersen & Abella, 2004).

Most web browsers can display a list of sites that the user has bookmarked so that users can quickly return to them. Bookmarks are also known as "Favorites" in Internet Explorer. In addition, all major web browsers have some form of built-in web feed aggregator. In Firefox, formatted web feeds as "live bookmarks" and behave like a bookmark folder that corresponds to the recent inclusion in food (Bokma, 2009). In the opera, the more traditional feed readers include a store and display content feeds (Opera Software, 2009).

Furthermore, the browser can be extended via plug-in, download the components that provide additional features.

### **COLLABORATIVE LEARNING**

Computer supported collaborative learning (CSCL) use teaching methods that are designed to encourage or require students to engage in learning tasks. CSCL is similar in concept to the term, "e-learning 2.0" and "learning network" (NCL) (Trentin, 2010).

Collaborative learning is distinguished from traditional approaches to instruction in which teachers are the primary source of knowledge and skills. For example, the new "e-learning 1.0" refers to the direct transfer method in learning and computer-based training (CAL). In contrast to the linear transmission of content, often directly from the instructor, CSCL using blogs, wikis, and cloud-based document portal (such as Google Docs and Dropbox). With the introduction of Web 2.0 technologies, the sharing of information between multiple people in a network that has become easier and consumption have increased (Crane, 2009). One of the main reasons for its use states that it is "a breeding ground for creative and compelling business education (Crane, 2009)".

Using Web 2.0 social tools in the classroom allows students and teachers to work together, discuss ideas, and promote the information. According to Sendall (2008), blog, wiki, and social skills are found to be significantly useful in the classroom. After an initial briefing on the use of tools, the students reported increases in knowledge and comfort level for using Web 2.0. Collaboration tools provide students with technology skills needed in today's workforce.

Locus of control remains an important consideration in the success of e-student involvement. According to the work of Cassandra B. Whyte, constant attention to aspects of motivation and success with respect to e-learning should be kept in context and together with the efforts of other education. Information about the tendency of motivation can help educators, psychologists, and technologists develop insights to help students perform better academically (Whyte & Lauridsen, 1980).

Another type of instrument is a collaboration application that allows students and teachers to interact while learning. One example is MathChat, which allows problem-solving and cooperative response to feedback (MathChat, 2015). Some applications may also provide an opportunity to revise or learn new topics independently in a classroom simulation. One popular example is the Khan Academy (Khan Academy, 2015), which offers materials in mathematics, biology, chemistry, economics, art history and many others. It has the advantage of combining learning styles as the app offers more videos for visual and auditory learners, as well as training and tasks to complete for kinesthetic learners. Other applications designed after the game, providing a fun way to check. When the experience is fun the students become more involved. The game also usually come with a sense of development, which can help keep students motivated and consistent when trying to improve. Examples of educational games is Dragon Box, Mind Snacks, Code spells and more (News.uci.edu., 2015).

### **CLASS 2.0**

Classroom 2.0 refers to various online user virtual environments (mauves) connecting schools in geographic boundaries. Known as "eTwinning", computer-supported collaborative learning (CSCL) allow students in the school to communicate with students in another that they would not get to know otherwise (Scuola-digitale.it., 2013), to improve educational outcomes [citation needed] and cultural integration. Examples of classes application is 2,0 Blogger and Skype (Pumila, 2012).

### **E-LEARNING 2.0**

E-learning 2.0 is a kind of collaborative learning (CSCL), which supported the computer system developed by the emergence of Web 2.0 (Karrer, 2007). From the perspective 2.0 e-learning, e-learning system is based on

conventional teaching package, which is delivered to students using assignments. Tasks that have been evaluated by the teacher. On the other hand, places the new e-learning increased emphasis on social learning and the use of social software such as blogs, wikis, podcasts and virtual worlds such as Second Life (Redecker, 2009). This phenomenon has been referred to as the Long Tail Learning.

E-learning 2.0, in contrast to e-learning systems not based on CSCL, assumes that knowledge (as meaning and understanding) is socially constructed. Learning takes place through conversations about content and interaction depth of the problem and action. Proponents of social learning claim that one of the best ways to learn something is to teach it to others (Brown & Adler, (2008).

In addition to virtual classroom environments, social networks have become an important part of the E-learning 2.0. Social networks have been used to foster online learning communities around subjects as diverse as test preparation and language education (Manprit, 2011). Mobile Assisted Language Learning (MALL) is the use of handheld computers or cell phones to assist in language learning. Traditional educators may discourage social networking unless they are communicating with their friends own (Crane, 2009).

Virtual Learning Environments (VLEs) and Personal Learning Environments (ples) provides an easy to use system to deliver flexible learning materials, activities and support to students in all institutions. Administrators, a VLE provides a set of tools that allow students to course content and will be managed efficiently and provide a single point of integration with student records system (Mohammed, 2009).

### **MEDIA**

Media education and tools that can be used to:

- Support the restructuring tasks: help with how to perform tasks (procedures and processes),
- Access to the knowledge base (help users find the required information)
- alternative forms of knowledge representation (knowledge representation, eg video, audio, text, images, data)

Various types of physical technology is being used (Forehand, 2010): digital cameras, video cameras, interactive whiteboard tools, document cameras, electronic media, and LCD projectors. The combination of these techniques include blogs, collaborative software, ePortfolios, and virtual classrooms.

### **AUDIO AND VIDEO**

Radio provides a vehicle synchronous education, while streaming audio via the internet with a webcast and podcast are asynchronous. Grade microphones, often wireless, can enable students and teachers to interact more clearly.

Video technology (Decker, Lane, O'Brien, & Kyger 2009) have entered VHS tape and DVD, as well as on-demand and simultaneous methods with digital video through a web-based server or as streaming video from YouTube, Teacher Tube, Skype, Adobe Connect, and web cameras. Telecommuting can be connected to speakers and other experts. Interactive digital video games used in higher education institutions (Biocchi 2011) and K-12.

### **COMPUTER, TABLET AND MOBILE DEVICES**

Collaborative learning is a group-based learning approach where students engage with in order to achieve the goal of learning or solve learning tasks. With recent developments in smartphone technology, processing power and storage capacity of a modern mobile phone allows for more rapid development and use of applications. Many application developers and educational experts have been exploring the smartphone and tablet apps as a medium for collaborative learning.

Tablet computers and allows students and educators to access websites and programs such as Microsoft Word, PowerPoint, PDF files, and images. Many mobile devices support m-learning.

Mobile devices such as clickers and smart phones can be used for interactive audience response feedback. Mobile learning can provide performance support to check the time, set reminders, get the worksheet, and instruction manual (Terras & Ramsay, 2012).

Open Course Ware (OCW) provides free public access to information used in the programs of undergraduate and graduate. Institutions that participated were MIT (Kiyoshi & Kumar, 2008) and Harvard, Princeton, Stanford, the University of Pennsylvania and the University of Michigan (Lewin, 2012).

## CONCLUSION

The supportive learning environment can support and encourage individuals to confirm attendance and participation. Linear students learn the most thorough and efficient, while the material presented to them in a logical, ordered progress. The power of collaboration to promote student learning to approach each other to solve problems and share knowledge not only build collaboration skills but lead to learning and better understanding. E-learning may be either synchronous or asynchronous. Synchronous Learning occurs in real time, with all participants interacting at the same time, while asynchronous learning is self and allow participants to engage in an exchange of ideas or information without the dependency of other participants involvement at the same time. The extent to which the e-learning or replace other learning and teaching approaches are different, ranging on a continuum from none to online distance learning entirely. Various descriptive terms used (somewhat inconsistently) to categorize the extent of the technology used. For example, the 'hybrid learning' or 'blended learning' can refer to aid classroom and laptops, or can refer to an approach in which traditional classroom time is reduced but not eliminated, and replaced with some online learning. 'Distributed Learning' can explain whether the e-learning component of a hybrid approach, or fully online distance learning environment. On the other hand, the convergence of media technology is the result of a long process of adjusting their communication resource for the history of evolutionary change every second.

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