BULETINUL Universităţii Petrol – Gaze din Ploieşti	Vol. LVIII No. 1/2006	51 - 56	Seria Matematică - Informatică - Fizică

Aspects of collaboration tools in E-learning

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Abstract

Collaboration tools help teachers and students work and learn together at a distance. They let the e-learning process participants share their ideas and even their sighs and smiles. They are essential for collaborative e-learning and knowledge management initiatives. The collaboration tools represent a category of a wide range of tools, from simple text-based e-mail clients to complex online meeting tools. Providing a complete collaborative environment may require to combine several separate tools and technologies. The paper presents an overview of the most important aspects of collaboration tools specific to e-learning process.

Keywords: *collaboration server, collaboration client, synchronously, asynchronously*

How Collaboration Tools Work

Most popular collaboration tools work the same way. Typically, someone creates a message in a collaboration tool called a client. The message then goes to a collaboration server that relays the message to other clients. The content can be almost anything – a simple e-mail composed in Microsoft Outlook, a reply to a chat message, a drawing on a whiteboard, a statement made in audio conferencing or a frame of video in video conferencing.

Regardless of its form, the message is sent to the server, which relays it to each of the client tools that should receive it. The client tools then display or play the message for their users. The collaboration process involves a client-server relationship, the most popular client-server relationship being shown schematic in Figure 1.

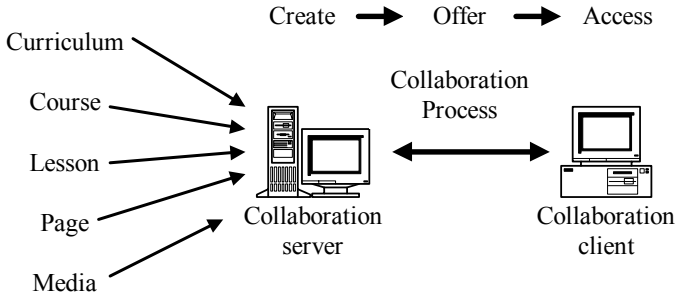

Fig. 1. Most popular client-server relationship

Collaboration tools typically require communication between two kinds of software to enable a dialog among participants.

First there is a collaboration server. It runs on a Web server on the Internet, an intranet or a LAN. Its function is to coordinate the flow of messages among participants. The second type of collaboration software runs on each participant's system. It is called a collaboration client and it enables the participant to receive and send messages to other participants by way of the server.

E-mail software is a simple example of this client-server relationship. Centralized e-mail servers route and dispatch messages that are then opened, read and answered using e-mail clients. The e-mail server may be a specialized software package, such as Microsoft Exchange Server or it may be built-in part of a standard Web server. This built-in server component is typically called a SMTP server, which stands for Simple Mail Transfer Protocol. The client part is the e0mail reader, such as Microsoft Outlook.

Some collaboration servers and clients provide multiple collaboration tools, whereas others specialize in one particular tool. A number of servers and clients are designed as matched sets where a specific brand of server requires the same brand of client. Of course this is not mandatory. The above presented client-server relationship is the most popular. But the specific market can provide variations of this client-server theme.

For example, some collaboration servers work only with corresponding client tools. Other collaboration servers, especially ones for textual media, require no specific client and can be accessed with a Web browser. To display other media, these servers use a media player. Such a setup is called thin client architecture because most of the software is in the server and little is in the client. Another variation omits the server altogether and enables collaboration clients to communicate directly with each other.

Tools like those called peer-to-peer (P2P) collaboration tools allow the communication to go directly from a client to another without passing through a server. Anyhow a server may still be used to register the address of potential collaborators so that they can find each other.

Collaboration tools can also be categorized based on whether they enable synchronous or asynchronous collaboration.

Synchronous Versus Asynchronous Collaboration

Collaboration tools can link participants synchronously or asynchronously as it is presented in Figure 2. Synchronous communications, also called conferencing, occur in real time. That is, all participants have to be online at the same time. Synchronous communication media include chat, application sharing, whiteboards, audio conferencing and video conferencing.

Asynchronous communications, on the other hand, do not require participants to be online at the same time [1]. Participants do not have to wait for a specific person to be online to send that person an e-mail message. They just send it, confident that eventually it will reach the desired person and the person will respond. With asynchronous communication, participants send messages when it is most convenient for them. Asynchronous media include e-mail and online discussion forums. Note, however, that discussion forums are less synchronous than e-mail because there is less expectation of speedy reply.

Many researchers conduct different studies referring to the collaboration tools and, as a final conclusion, many of them have accepted as fact that we are entering a time when collaboration will be an essential part of teaching and learning. Among the most prominent collaborative tools in e-learning process are synchronous learning environments. In Bonk J. C. study [2], 35% of the respondents were relying on such online presentation tools for the delivery of e-learning. Technologies enable communication among learners, remote presentations from specialists or instructors, online meetings and virtual classrooms. It is likely that live or synchronous teaching on the Web will become more cost-feasible and effective.

In terms of common features and functions, synchronous Web-based collaboration platforms and tools typically include shared whiteboards and chat tools. In terms of collaboration, the chat tools leads learner to brainstorming and questioning, present clarifications and explanations and play a role of a private one-to-one mentoring. They can foster the collection of immediate responses to an idea from learners around the globe. In addition, an electronic whiteboard can help focus learners on certain ideas or processes.

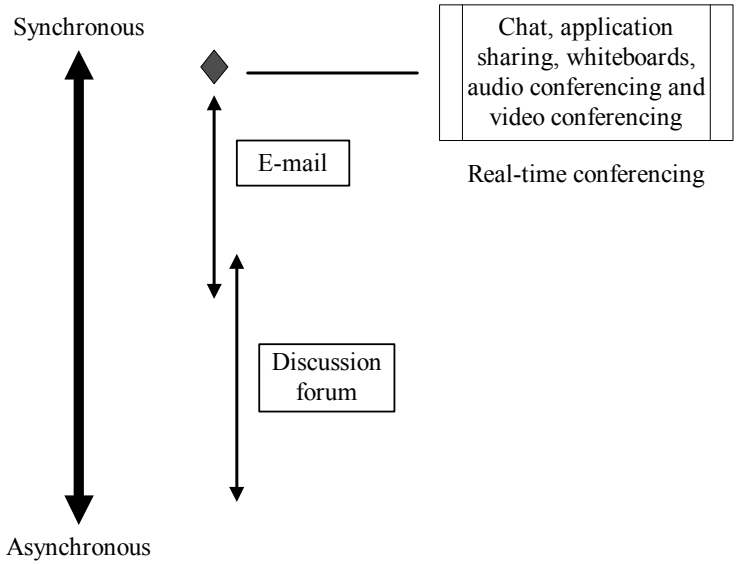

Fig. 2. Synchronous vs. Asynchronous Collaboration

Other synchronous training tools commonly found include breakout rooms, online surveys or polling, file transfer and discussion boards. On the plus side, these tools can promote knowledge transfer through specialists' demonstrations or modeling and immediate learner application.

Collaboration Tools and Capabilities

Collaboration tools make it possible for participants to communication freely and to work together on common tasks [3]. In Figure 3, the author presents a short overview of these tools together with a general scheme referring to how they are used in e-learning.

The simplest tool is e-mail between the instructor and learner. Often e-mail messages are broadcast, typically from the instructor to all learners to announce a change or an event. Learners and instructors can also post messages on online discussion forum. Others can read and reply to these messages.

Several collaboration tools provide real-time exchanges among the instructor and learners. For example, participants can use chat or instant messaging to exchange text messages. The instructor may also use a polling tool to encourage voting on issues and other types of choices.

Another group of tools helps distant learners share a common experience. A whiteboard lets learners share a graphic and take turns marking it up. The instructor may conduct a Web tour to take all participants to the same Web sites. Through application sharing, the instructor lets learners see and interact with a computer program, a window or a document.

When network speed allows, learners can use audio conferencing much as they would a telephone conference call to talk with the instructor and each other. Those with very fast

networks can use video conferencing to see the instructor or to swap video images of each other. Online collaboration tools may require learners to download and install a corresponding piece of software called a collaboration client.

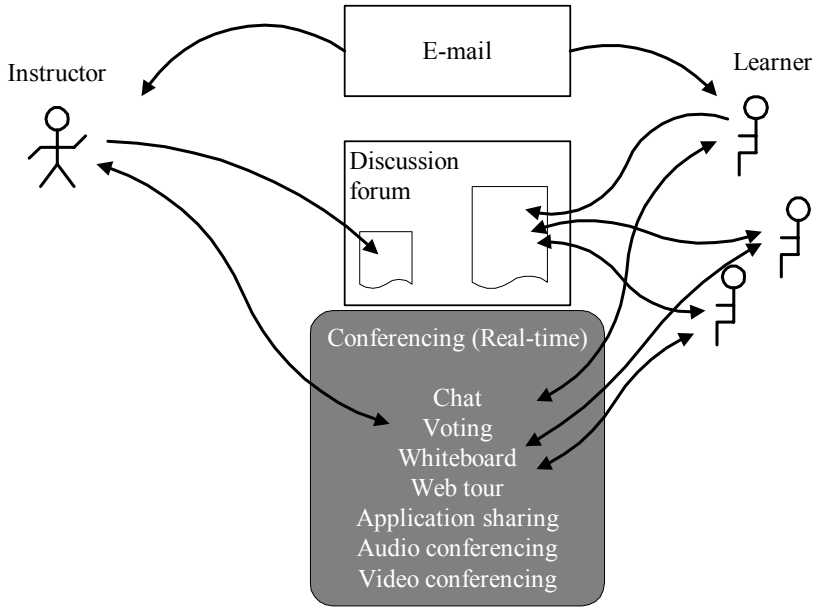

Fig. 3. The use of the most popular collaboration tools in e-learning

Clients for collaboration tools are components that run on the learners' computers to enable them to interact. They are the learners interface to the online meeting tool. Clients communicate with one another by way of a collaboration server, which takes care of routing messages among all participants in a collaboration activity.

For most e-learning applications, collaboration clients are usually paired with a particular collaboration server or online meeting tool. Notable exceptions include e-mail readers, newsgroup readers and online discussions that appear directly in a browser window.

Choosing Collaboration Tools

Because collaboration tools involve so many different media and capabilities and because they come as standalone tools or capabilities built into composite tools, picking the right tool can be tricky. The first step when a collaborative tool is to be chosen is to decide what collaboration capabilities are necessary to achieve the proposed goal. After, pick the collaboration clients and server to implement them. In fact, the choice of collaboration tools is partly a decision about technology [4].

To choose the right collaboration tool as was mentioned above, one shall clearly stablish what is already in place and what is more necessary to have. Of course, one of the main obstacles is the limitation provided by the IT resources available and possible to be bought from the market.

A part of the financial resources issue involved in the matter is also the question: "What combination of operating system and hardware does the collaborative server support?"

Not all tools work on all systems [5]. The responsible person with this issue shall make sure these requirements are compatible with the requirements of other software that must run on the same PC.

Meeting the size of the participants in the process number is another very important criterion to be used when a collaboration tool is to be chosen. The number of participants shall be exactly established as accurate as possible. At this point, the author is highlighting the fact that the opinions of experts regarding the most effective size for the e-learning class are different. The range recommended for a single e-learning teacher is between 5 – 10 participants to 20 – 30 participants.

It is difficult to say which recommendation is the most appropriate. The complexity of the factors involved in this decision cannot allow some one to say exactly which the best solution is. In any case, as a personal opinion, the author believes that the best solution is the one ensuring the highest level of learning effectiveness and only the teacher / expert itself can say in his case which solution is applicable.

Another very important issue in establishing the relevance is the leaner needs. The choice of a collaboration tool, as a part of a decision about technology, is also a decision about human factors. What human factors should determine the choice of collaboration tools? Bellow, the author, presents a few of these:

- Language fluency – limits the use of real-time conferencing that requires people to understand and respond immediately and accents limit the use of audio conferencing and video conferencing because these technologies rely heavily on voice.
- Typing skills – are required for chat and instant messaging to be spontaneous and fluid.
- Technical expertise – could be a barrier if participants must install required hardware and software themselves.
- Connection speed – limits the use of media such as voice and video that require high bandwidth.
- Geographic distribution and work schedules – could limit their participation in any conferencing events that require everyone to be online at the same time.

As it can be seen from all the above considerations, choosing a collaboration tool is not a simple task and for sure it is not easy. Financial, human and technology complex factors are to be taken into consideration and properly evaluated before making a decision.

Conclusions

Communication is critical for any important task that involves more than one person. Computers can be an obstacle to communication because they tend to encourage individuals to work in isolation. At the same time, computers offer the potential for easier, more flexible communication. E-mail, for example, was the computer revolution's first major contribution to communications within and among organizations. Sending an e-mail is much faster and more reliable than dispatching a messenger with an envelope in hand to run from one office to another, for example.

The next wave of computer-aided communications, however, promises to expand the channels of communication even further. Unlike e-mail, Web conferences allow real-time interaction and collaboration, and they often combine text communications with other media, such as audio and video. Whether across campus, between cities or worldwide, Web-enabled communication and collaboration have come of age [5].

Once inhabitants of the Internet badlands, online chatting and videoconferencing are now found in products and services that are secured with authentication, access-control lists and encryption. In addition, Web conferencing solutions can easily be integrated with agency portals and

directory services. Participants can routinely take polls, collaborate on business documents, share desktop PCs and applications, and start meetings via e-mail.

If we look ahead another 10 years, standard collaborative technologies will include features or options for videoconferencing, chat, surveying, mentoring, joint document creation and resource sharing. Novel features might include sensor indicators of the need for collaboration as well as the availability and selection of collaborative partners. Specialists will also be available on demand to help brainstorm ideas or edit collaborative documents. And there undoubtedly will be peer and expert ratings to choose the best person for the job or to match learners to specific types of expertise. As education needs become lifelong, advances in collaborative learning tools will impact everyone. But it is not necessary that the tools for collaboration should be the most important or interesting, but the types of interactions made possible by these technologies.

Given the collaborations that are now possible with peers, teachers, expert mentors and even artificially intelligent agents, there certainly is no shortage of collaborative tools and associated learning opportunities. The future of collaboration tools is bright and wide open.

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Aspecte despre instrumentele colaborative în e-learning

Rezumat

Instrumentele colaborative ajută profesorii şi studenţii să lucreze şi să înveţe împreună în cadrul programelor de instruire la distanţă. Aceste instrumente sunt esenţiale pentru învăţarea colaborativă de tip e-learning şi pentru iniţiativele de managementul cunoaşterii. Instrumentele colaborative reprezintă o categorie foarte diversificată de instrumente pornind de la cele de tip e-mail până la cele complexe precum întrunirile online. Capabile să furnizeze un mediu colaborativ complet aceste instrumente pot necesita combinarea mai multor instrumente şi tehnologii . Articolul prezintă o trecere în revistă a unora dintre cele mai importante aspecte ale instrumentelor colaborative specifice procesului de tip e-learning.