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THINGS YOU SHOULD KNOW ABOUT...™

ORGANIZING FILES IN THE CLOUD

Scenario

Martin commutes 40 minutes each way to a local college and works part time at a computer and electronics store. He does his research for assignments in bits and pieces, whenever he has 10 minutes to spare, but always feels as if he's juggling files by e-mail or USB drive between the netbook he carries with him and the laptop he leaves at home.

This semester he is working on a team project for his technical writing course. The team meets after each class session, and today they are discussing their project. They will provide instructions on how to make effective videos using the handheld equipment students can check out from the media center. Their project will include a section on getting reliable sound quality and procedures for uploading and editing video files. It will feature tips and tricks, lists of free online tools to use, and a section on frequently asked questions.

Today the team is brainstorming ideas and deciding who will work on which sections. One team member, Eve, uses a cloud-based storage and file-management service to create a shared folder for their joint work. In this way, the research notes, images, videos, audio files, and drafts they create will be stored in a single location for all of them to see and use.

That evening, Martin installs an app for the file-management service on both of his computers. He also sets up the service on his Android phone and downloads a few additional apps for viewing his files on it. In addition to the team's collaborative folder, he creates folders for other classes.

A hard disk crash on his laptop just before the team's project is due makes Martin doubly happy that he's using a remote storage application. Meanwhile, the group project has progressed well. Team members have been able to provide critiques of each other's work and ensure that the suite of documents they will submit is consistent in presentation, tone, and character. Meanwhile, Martin hasn't forgotten his previous frustration with keeping his files up-to-date and synchronized on all his hardware. He's thrilled that the storage solution has taken so much stress out of completing his coursework.

1 What is it?

Information technologies, particularly mobile devices and apps, play a growing role in teaching and learning and in the personal lives of students and faculty members. The issue of **file storage and management has become a potentially limiting factor in the usefulness of new technologies, and cloud-based file services such as Dropbox, SugarSync, AeroFS, and Box.net attempt to fill that need**. These services synchronize all of a user's files across multiple platforms, providing access and versioning from a wide range of devices. Files are always available, whether from a desktop, laptop, tablet, or smartphone, and most services allow users to work on a file offline, synchronizing versions the next time the device is connected. Many cloud-based file services offer a free version (with limited storage space) and one or more fee-based versions that offer more storage and additional features.

2 How does it work?

Although functionality varies, most services require users to set up an account and install an application on any device they want to use with the service. Through this app, users set up files and folders to be included in the service, and these files—which can be documents, images, spreadsheets, charts, music, videos, or any other file type—are synchronized across multiple platforms, including Mac, Windows, Linux, iOS, Android, and BlackBerry. **Files are stored "in the cloud," and each time the user accesses the service, the files are synced with whatever device is currently being used.** In most cases, a persistent local copy of each file is kept on each device, allowing users to access and edit files even without Internet access—files are synced as soon as access is available. From the user's perspective, all of the files are simply "there" when needed: You can work on a file at home, save it, go to campus and open it from another computer or mobile device, and always have access to the current version. Some services also maintain previous versions for retrieval, and users can typically use such cloud-based file services to share files with other users. Security approaches differ, but stored files are generally encrypted, and some are also encrypted during transmission.

3 Who's doing it?

Many students have found that cloud-based file management provides the convenience and flexibility needed for their mobile, always-connected lifestyles, and growing numbers of them show up at college having used such services in high school. Many faculty members, too, use these services to stay organized. At Purdue University, Mixable is an application that allows students

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to build study groups and do coursework in Facebook, using Dropbox to back up, sync, and share files. In this implementation, Dropbox provides an alternative to the USB drives, FTP sites, and e-mail attachments that students commonly use to share files.

Because an institution has so little control over files stored in the cloud, many colleges and universities are deeply concerned about the use of cloud storage services among staff—or even faculty members—who might be working with files that contain sensitive information. Some institutions have issued policies discouraging or forbidding cloud-based file management for official institutional files. The University of Melbourne, for example, has posted a Dropbox policy online, which explains the security and privacy considerations of the application and provides guidelines for its use.

4 Why is it significant?

Although cloud-based file management services represent another instance of the tension between convenience and security, the benefits for users are compelling. Legitimate concerns surround the privacy and availability of files, but **the seamless, cross-platform functionality of cloud-based file services provides high levels of access and flexibility**. When users can access their personal files from any device, they might find they can own less-expensive or less-sophisticated hardware—for example, relying on a tablet or a netbook rather than a laptop or desktop. These services can also support collaborative endeavors and reduce problems with version control. For most users, cloud-based file storage is easier to use than campus-based network storage or a traditional file server, and it provides a simple mechanism for file backup that also allows users to maintain their coursework and projects even after they have left a college or university.

5 What are the downsides?

The primary concern about cloud-based file services is security, both in storage and in transmission. Encryption helps, of course, but is not a fail-safe solution. Moreover, cultural or regulatory climates can be an obstacle—in some countries, no institutional data may be stored on servers outside that nation, making a cloud file service illegal. In any case, **education and awareness among users are necessary to minimize file-management activities that could expose private information**, whether personal or institutional. Long-term viability of the file-service provider might be a concern, though services that maintain a local file on separate devices should guarantee continued access to a user's files. Users must typically pay for storage capacity above a certain threshold, placing a financial burden on some, and some services limit the size of individual files. Finally, because the applications that run on individual devices are continually checking for new versions to synchronize, cloud-based file services can degrade system performance.

6 Where is it going?

Large **firms like Amazon, Google, and Apple have begun to provide their own file-management and cloud-storage services**, which will speed development and adoption of these tools. Amazon Cloud Drive, for example, provides streaming access for users who want to store music and videos in the cloud but play them on local devices. Music from the Amazon MP3 store can be uploaded directly to the Cloud Drive, allowing customers with the Amazon Cloud Player to listen to music from any computer with a web connection or any Android phone with the Amazon MP3 app. Movies and e-books, as well as applications to view them, might soon be available from multiple vendors for purchase and upload to cloud storage. As more individual students and faculty members employ these tools in course-related efforts, institutions will need to specify policies for what kinds of data can be stored and managed in this manner.

7 What are the implications for teaching and learning?

The greater the number of devices and platforms an individual uses to interact with content, the greater the convenience offered by this technology. For commuting students, students with jobs, and others who find themselves working in short bursts at coffee shops or media centers, having files available in the cloud could become a vital component of an effective academic career. **Cloud storage offers students and faculty the option to work in real time more effectively because it increases the range of files available for on-the-spot access.** Changes that are made in shared files are quickly available to all users who have access to those files, and users can focus on learning rather than file management. Files can be e-mailed to or shared with an instructor from any device that has web connectivity, offering new possibilities for how academic assignments are conceived, completed, and submitted.

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