

DropBox Software Evaluation and Redesign: Interim Progress Report

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Introduction

Cloud storage has become an essential component of online collaborative work. Cloud file hosting services provide a means for individuals to store and share data in a public and private cloud, and also helps to synchronize files. Dropbox, developed by Dropbox Inc., is a popular online backup service, with 400 million users worldwide, that has changed the face of the collaborative working environment (Chang, 2015). Dropbox allows for file sharing between users and is an essential software being used in Computer Supported Collaborative Work (CSCW). Filesharing is important in the academic setting for both researchers and academics, and is also important for designers. Dropbox simplifies scholarly collaboration by allowing researchers to share files and data easily across various platforms (Hicks, 2014). Teachers and students find Dropbox an effective and successful tool since it allows for easy course management, thus showing that Dropbox is also beneficial in an academic environment (Niles, 2013). Dropbox lacks features such as: user pathname resolution, API sophistication, and video and audio integration (Hicks, 2014). It also does not include features related to calendar integration, security, editing, and annotation issues (Quora, 2013).

A study done by Parmaxi and Zaphiris (2015) looked at the dynamics of social technologies, such as Dropbox, Wikispaces, Google Documents, Facebook, and blogs, as social microworlds. Microworlds are an element of constructionism theory, which believes that effective learning occurs when individuals make sense of the world around them by creating connections between old and new knowledge, while interacting with others to create important artefacts (Parmaxi & Zaphiris, 2015). This study found that all five social technologies used were needed to create a social microworld that would allow the participants to complete the tasks they were required to do (Parmaxi & Zaphiris, 2015). Parmaxi and Zaphiris (2015) believe that the design of well-structured microworlds must acknowledge the needs and expectations of both teachers and students, and that the design must also acknowledge the affordances of the technology being used. The technologies chosen must be based on cultural trends in order for the social microworld to be adopted in a learning environment (Parmaxi & Zaphiris, 2015).

Our goal is to design and prototype a “social microworld” based off the current design of Dropbox that will include support for the features that are not currently supported by Dropbox. By doing this, we hope to create one tool that will support all the needs individuals trying to complete collaborative work.

Motivation. With the study by Parmaxi and Zaphiris (2015) in mind, we believe that this project will help students and professionals who use a variety of CSCW software to

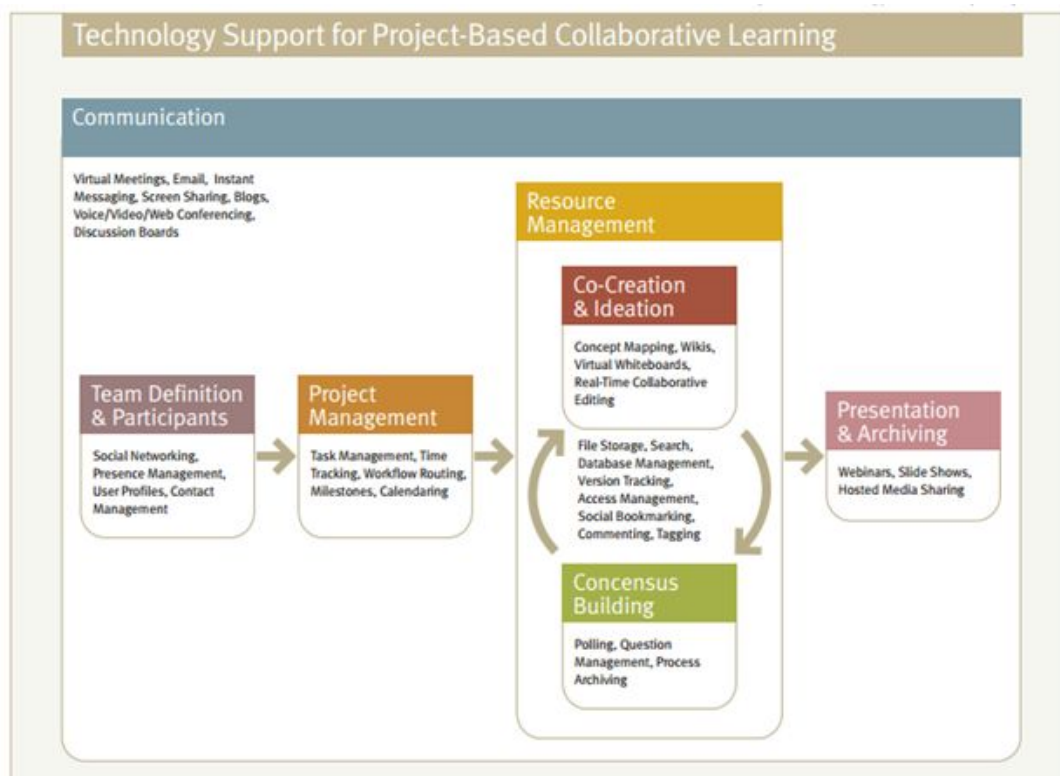
have one software that will fulfill all of their communication and design needs. Furthermore, it will be a tool which will bundle together all of the features which have been found to be successful in a variety of other software programs. Using our methodologies, we are beginning to determine what makes a CSCW software effective. Furthermore, we have created a list of dimensions that we believe to be crucial for a successful CSCW tool. The impact will be far reaching as we plan to create a technical software mockup demonstrating our changes, and we plan to submit this feedback in a professional technical report back to Dropbox, along with guidelines on how and why they should be implementing these changes.

Related Works

One study done by Woodzicka, *et al.* (2014) implemented a multi-faculty, multi-project model that involved students and faculty from two different universities collaborating on a single research study. The students and faculty members used Skype, Dropbox and email to collaborate on the study (Woodzicka, *et al.*, 2014). The study found Dropbox to be vital in helping the students and faculty share literature, stimulus materials, and data (Woodzicka, *et al.*, 2014). Dropbox also allowed for synchronous file editing, which alleviated the need for email notifications every time a document was updated (Woodzicka, *et al.*, 2014). Skype allowed the students and faculty to have scheduled, collaborative meetings, which enabled them to have “face-to-face” conversations about their study (Woodzicka, *et al.*, 2014). The paper by Olsen and Olsen (2014) identifies four main barriers to successful collaboration: time zone differences, cultural boundaries and institutional differences, trust among collaborators, and communication between collaborators. Olsen and Olsen (2014) also identified four types of technologies that support distance work: communication tools, collaboration tools, information repositories, and computational infrastructure. Communication tools include: email and texting; voice and video conferencing; chat rooms, forums, blogs, and wikis; and virtual worlds (Olsen & Olsen, 2014). Collaboration tools include: shared calendars; awareness tools; meeting support; large visual displays; and workflow and resource scheduling (Olsen & Olsen, 2014). Information repositories include: databases; shared files; blogs or wikis; and online laboratory notebooks (Olsen & Olsen, 2014). Computational Infrastructure includes: system architecture; the network; large-scale computational resources; and human computation (Olsen & Olsen, 2014). These definitions will help us to identify certain features in the different technologies we are investigating that will lead to the design of an all-inclusive collaborative tool.

Another study done by Rowe, Bozalek and Frantz (2013) looked at using Google Drive as a collaborative online authoring environment to facilitate a blended approach to authentic learning. Through technology traditional learning has changed dramatically. Our society is moving away from classroom learning and in some places adopting a blended approach to learning. Exposing students to enhanced communication and more engaging structures that encourage real life dialogue with no barriers to locations or class room books provides learners a unique experience that is developing important competencies such as critical thinking that is needed to be successful in the modern world (Rowe, Bozalek and Frantz, 2013). Empowering students to take control of their learning and developing the skills to do so is a shift from traditional learning. The standard of thinking within the confines and parameters of the textbook, is an obstacle in finding creative ways for solving problems (Rowe, Bozalek and Frantz, 2013).

Carnegie Mellon University published a paper about the role of teaching with collaboration tools (Deal, 2009), specifically how technology can be leveraged in project-based collaborative learning that require students to engage in design, problem-solving, decision-making and analysis to create an end product. These technology tools help facilitate team communication, project management, co-creation, consensus building, resource management, versioning and live/remote presentations.



Some other key takeaways from this paper include (Deal, 2009):

- Groups generate better range of ideas and group participation is more equal when collaboration tools are used because individuals can be more open and not feel inhibited compared to being in an actual group discussion
- Choice of collaboration tools should depend on the type and objectives of the project
- Technology can help instructors better monitor individual and group performance and prevent social loafing (likelihood that individuals piggyback on other group members)

Methodology

Evaluating Computer Supported Cooperative Work software is a very difficult and intricate task. It is not simple and there exist a multitude of evaluation techniques to determine whether or not a software is effective (Dugan *et al.*, 2003). A researcher must determine which perspective they will take to evaluate the software, whether from a HCI or a social issue perspective (Dugan *et al.*, 2003). Our group has chosen to focus on our evaluation from a technological CSCW perspective.

We began by evaluating DropBox in detail using an extensive literature review. We acquired our articles from online databases using Summon 2.0 (UVic library website) and Google Scholar. We chose which elements of the software based on the list of considerations provided by Olson and Olson (2014) when choosing a CSCW software. The list of considerations is as follows: Thus far based on our software evaluations, we have determined which elements are of importance for CSCW software and tools. We will consider these when we finalize our analysis of Dropbox and create our mockup. We will evaluate Dropbox and our mockup in depth based on the following dimensions:

- Speed of the software response
- Computational requirements (size of the message/data)
- Security
- Privacy
- Accessibility
- User control (who can read, write, and edit)
- Richness of data transmitted

- Ease of use
- Context information (who did what, and when)
- Cost
- Compatibility with other software and applications

We evaluated these considerations in depth for Dropbox and six other major CSCW software: Box, MS Sharepoint, Google Drive, Slack, OneDrive, GitHub. Thorough comparison between these softwares and Dropbox have begun to determine which features Dropbox is lacking and which features Dropbox excels in.

We have completed our ethics application and submitted it. While completing the ethics application, we began work on our survey. Our survey contained 11 questions and attempted to discover what features of a software were important to our demographic in question (post-secondary computer science students using CSCW software for research or study purposes). Our survey was sent via email and posted on Slack. We surveyed students from the class in addition to other post-secondary students at UVic. Also, we surveyed a few faculty and staff members of UVic. The goal of the survey was to determine what students do and do not find effective in DropBox and other softwares from a subjective point of view, and to combine these results with the objective results obtained from our software comparison. Using this information that we now have, we will re-design Dropbox by creating a mockup using Photoshop and Invision. We will evaluate our mockup based on our findings in our extensive literature review. That is, once we have determined which features are necessary for a successful CSCW software, we will include these in our mockup and attempt to evaluate our final design based on whether or not these have been successfully and efficiently implemented.

Software Comparison Results

We have included our initial software comparison results. These results are as follows:

Box

| | Box | Dropbox |
|--|------------|----------------|
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| | | |
|-----------------|---|--|
| Audience | Collaborative cloud storage for the enterprise. | Cloud storage services made easy enough for anyone primarily targeting general users although there are enterprise editions. |
| Summary | Document creation and collaboration features are great for business, but syncing is slow and it's not as tailored for multimedia. | Easy for anyone to store and organize photos, but synchronization can hog resources and skeptics question security vulnerabilities. It allows the consumer to add files and folder through the web browser. It uses a syncing folder that is added to the device (i.e., desktop or mobile device). |
| Pros | <ul style="list-style-type: none"> • Enterprise-class security, including SSL, SSO and data-loss prevention. • Robust integrations with enterprise apps, such as Salesforce and Google Apps • Compliance with industry-specific regulations, such as HIPAA in healthcare. • In-program document creation and collaborative editing capabilities for teams | <ul style="list-style-type: none"> • Easy to use, with an interface most anyone can understand. • Free and relatively fast syncing of files even with the most basic plan. • Graduated pricing levels fit the needs of individuals and smaller organizations • Robust photo and video presentation and sharing, including HTML5 streaming. |
| Cons | <ul style="list-style-type: none"> • Enterprise sophistication requires a more complex user interface - could be confusing. • Emphasis on business documents means less robust photo and video capabilities • No LAN sync and some users report challenges with syncing • Limited support for photos and videos (e.g. no sync of photos to phones) | <ul style="list-style-type: none"> • Not a collaborative editing platform, if that's what you're looking for. • Not everyone has a strong subfolder taxonomy, so finding files can be difficult. • Limited integrations to business apps, despite a good application |

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| | | <p>programming interface (API).</p> <ul style="list-style-type: none"> • Lacks enterprise-class security capabilities and has had a few security blunders here and there. |
|--|--|--|

Github

| | GitHub | Dropbox |
|-----------------|---|---|
| Audience | Web-based Git repository that offers a version control system for software development primarily, however users can adapt GitHub for other purposes | Cloud storage services made easy enough for anyone primarily targeting general users although there are enterprise editions. |
| Summary | <p>GitHub is mostly used as a software development code repository and provides the following services through a web-based GUI:</p> <ul style="list-style-type: none"> • revision control • source code management • access control • bug tracking • feature requests • task management • wikis <p>Users can create a free account or pay for a private repository with increased features</p> | <p>Easy for anyone to store and organize photos, but synchronization can hog resources and skeptics question security vulnerabilities. It allows the consumer to add files and folder through the web browser. It uses a syncing folder that is added to the device (i.e., desktop or mobile device).</p> |
| Pros | <ul style="list-style-type: none"> • Versatile: ideal for working on projects of any size; ideal for web work flows • Version control: creates a backup of your work instead of saving the code on a desktop or corporate server • Archive your projects and share them with your peers for inspiration or collaboration | <ul style="list-style-type: none"> • Easy to use, with an interface most anyone can understand. • Free and relatively fast syncing of files even with the most basic plan. • Graduated pricing levels fit the needs of |

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| | <ul style="list-style-type: none"> • Git as a preventative maintenance process • Good for tracking code • Allows you to comment on changes to a document | <p>individuals and smaller organizations</p> <ul style="list-style-type: none"> • Robust photo and video presentation and sharing, including HTML5 streaming. |
| Cons | <ul style="list-style-type: none"> • relatively difficult to use for new users - hard to understand the conceptual model of Github • not the best tool for capturing creative process or for recording ideas • GUI: confuse to use for some users, reason to use other platform instead • problems with branching (as people cannot see what other people are doing) <ul style="list-style-type: none"> ○ duplication ○ missing info ○ disjointed writing ○ painful process when combining <ul style="list-style-type: none"> ■ join all the parts together & standardize the styles • unable to collaborate further after the combination process | <ul style="list-style-type: none"> • Not a collaborative editing platform, if that's what you're looking for. • Not everyone has a strong subfolder taxonomy, so finding files can be difficult. • Limited integrations to business apps, despite a good application programming interface (API). • Lacks enterprise-class security capabilities and has had a few security blunders here and there. |

Google Drive

| | Google Drive | Dropbox |
|-----------------|---|---|
| Audience | Cloud storage services designed for customers to view files from any phone, tablet or computer that's connected to the Internet, and also provide backup for files so they'll never disappear if the phone gets lost or your computer crashes. | Cloud storage services made easy enough for anyone primarily targeting general users although there are enterprise editions. |
| Summary | Google Drive offers the ability to upload documents from within a web browser, which is way more convenient, and a big win from Dropbox. It dumps everything into one location and the consumer must create folders to organize. Some of the buttons are not easy to understand and could be confusing for a new user. Having the additional features and the ability to upload directly from the web browser gives Google Drive consumer a easier user experience when it comes to ease of use. | Easy for anyone to store and organize photos, but synchronization can hog resources and skeptics question security vulnerabilities. It allows the consumer to add files and folder through the web browser. It uses a syncing folder that is added to the device (i.e., desktop or mobile device). |
| Pros | <ul style="list-style-type: none">● Free account size. This cloud storage platform offers a free 15 GB to users. Additional storage can be purchased if desired for as little as \$1.99 a month.● Other features include: Create documents, spreadsheets, and presentations, Works with products such as Gmail and Google+, Search tools, View over 30 file types including Adobe Illustrator and Photoshop, Files are saved are saved for 30 days automatically ,Start a discussion | <ul style="list-style-type: none">● Easy to use, with an interface most anyone can understand.● Free and relatively fast syncing of files even with the most basic plan.● Graduated pricing levels fit the needs of individuals and smaller organizations● Robust photo and video presentation and sharing, including HTML5 streaming. |

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| | <ul style="list-style-type: none"> • Having the ability to create different types of documents allows simultaneous collaboration, an added plus for many consumers. It allows them to start tasks in their cloud drive and not on their local disks, which can save time when sharing information. • Google offers AES-256 bit encryption for their customers. • It dumps everything into one central location. The only folders made are the ones you create yourself. • It is easier to share folders by right clicking the desired file and selecting “share with.” • There are more options than simply sharing and saving. | |
| Cons | <ul style="list-style-type: none"> • Google offers AES-256 bit encryption for their customers. • Like the competition, this promise of security doesn’t keep Drive from having its share of problems. However, problems aren’t just about phishing schemes and other external factors. They are more internal. • Unexplained loss of files from their servers. • Many users have complained that files were removed from their accounts without their knowledge. Seems like Google has a memory issue. | <ul style="list-style-type: none"> • Not a collaborative editing platform, if that’s what you’re looking for. • Not everyone has a strong subfolder taxonomy, so finding files can be difficult. • Limited integrations to business apps, despite a good application programming interface (API). • Lacks enterprise-class security capabilities and has had a few security blunders here and there. |

Microsoft SharePoint

| | SharePoint (SP) | Dropbox |
|-----------------|---|---|
| Audience | A cloud-based service, hosted by Microsoft, primarily targeted at businesses to use for project management. | Cloud storage services made easy enough for anyone primarily targeting general users although there are enterprise editions. |
| Summary | Businesses, organizations and project teams can use SharePoint to create websites and/or as a place to securely store, share, organize and access information/files from any device. | Easy for anyone to store and organize photos, but synchronization can hog resources and skeptics question security vulnerabilities. It allows the consumer to add files and folder through the web browser. It uses a syncing folder that is added to the device (i.e., desktop or mobile device). |
| Pros | <ul style="list-style-type: none">• Although no free option, SP offers lots of variable pricing plans for teams that only want a certain subset of features• Highly integrated with other Microsoft products and other systems (SAP, Oracle, etc.) and can be implemented through the cloud or on-premise• Offers a robust set of features needed that covers almost all aspects of project management• Performance leader in the software collaboration tool space• Includes customizable security features and increased social networking abilities• SharePoint is a web application built on top of SQL Server | <ul style="list-style-type: none">• Easy to use, with an interface most anyone can understand.• Free and relatively fast syncing of files even with the most basic plan.• Graduated pricing levels fit the needs of individuals and smaller organizations• Robust photo and video presentation and sharing, including HTML5 streaming. |

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| | <p>therefore file retrieval and access is relatively fast</p> <ul style="list-style-type: none"> • SP has a 99.9% Uptime service level agreement as well as built-in disaster recovery and Firewall • Allows users to work on files in the cloud as well as downloading files to local machine and then making revisions • SP improves document sharing through: <ul style="list-style-type: none"> ○ Versioning ○ Co-authoring ○ Web authoring ○ Metadata ○ Workflows ○ Content approval ○ Social interactions ○ Document search capability • SP has strong search functions, security, rights management and integration with Microsoft Office products • Can customize permissions across entire SharePoint deployment to keep access rights aligned with project needs | |
| Cons | <ul style="list-style-type: none"> • Increased UI complication due to extremely rich set of features/capabilities • No freemium version available and software is not ideal for individual users • Steep learning curve for new users to become familiar with all the features of SP can lead to usability issues • Includes more powerful sharing features however this comes | <ul style="list-style-type: none"> • Not a collaborative editing platform, if that's what you're looking for. • Not everyone has a strong subfolder taxonomy, so finding files can be difficult. • Limited integrations to business apps, despite a good application |

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| | <p>with more complicated workflows for certain processes</p> <ul style="list-style-type: none"> • Lots of planning and governance is needed for SP to be implemented properly for large project teams • Difficult to share files with others if using the on-premises version of SharePoint which can make it difficult for customers/partners/people outside group project to access your documents with their Microsoft accounts however this can be changed although not without difficulty • A Microsoft account is mandatory for cloud version of SharePoint • DropBox has a simpler and more intuitive user interface than SharePoint. | <p>programming interface (API).</p> <ul style="list-style-type: none"> • Lacks enterprise-class security capabilities and has had a few security blunders here and there. |
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Microsoft OneDrive

| | OneDrive | Dropbox |
|-----------------|--|--|
| Audience | General users Academics Collaborative groups | Cloud storage services made easy enough for anyone primarily targeting general users although there are enterprise editions. |
| Summary | From Microsoft, it is a file storage software. Very powerful with high file size storage potential and editing, collaborating, and communication features. | Easy for anyone to store and organize photos, but synchronization can hog resources and skeptics question security vulnerabilities. It allows the consumer to add files and folder through the web browser. It uses a syncing folder that is added to the device (i.e., desktop or |

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| | | mobile device). |
| Pros | <ul style="list-style-type: none"> • Very large file size restriction (10GB) • Can be used on the web or can be downloaded as a desktop app • Store photos, videos, documents (any file) • Uses automatic cloud syncing • Works closely with MS Office apps (word, powerpoint) • Can collaborate in real time • Can open and edit files in MS office apps (word, excel, etc) • Automatic file organization (prone to mistakes) | <ul style="list-style-type: none"> • Easy to use, with an interface most anyone can understand. • Free and relatively fast syncing of files even with the most basic plan. • Graduated pricing levels fit the needs of individuals and smaller organizations • Robust photo and video presentation and sharing, including HTML5 streaming. |
| Cons | <ul style="list-style-type: none"> • Some mobile OS not supported • Automatic file organization can be very incorrect <ul style="list-style-type: none"> ◦ Can store in wrong/incorrect folders | <ul style="list-style-type: none"> • Not a collaborative editing platform, if that's what you're looking for. • Not everyone has a strong subfolder taxonomy, so finding files can be difficult. • Limited integrations to business apps, despite a good application programming interface (API). • Lacks enterprise-class security capabilities and has had a few security blunders here and there. |

Slack

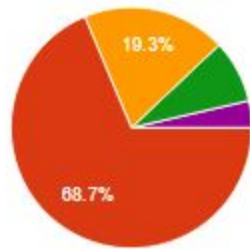
| | Slack | Dropbox |
|-----------------|--|---|
| Audience | <ul style="list-style-type: none">• Professionals• Students• Any collaborative group | <ul style="list-style-type: none">• Cloud storage services made easy enough for anyone primarily targeting general users although there are enterprise editions. |
| Summary | <ul style="list-style-type: none">• Designed for business collaboration• Bot assists with personalized account setup• Default channels (similar to IRC chat rooms); can modify and add channels• Join channels for communication• Pick and choose your topics/communication channels | <ul style="list-style-type: none">• Easy for anyone to store and organize photos, but synchronization can hog resources and skeptics question security vulnerabilities. It allows the consumer to add files and folder through the web browser. It uses a syncing folder that is added to the device (i.e., desktop or mobile device). |
| Pros | <ul style="list-style-type: none">• Communication: allows for remote connections• User list management: simple; allows for bulk import (versus manual invite)• Operating system application and support• Notification settings<ul style="list-style-type: none">◦ adjustable◦ choose how much/little participation• Slack client = web page<ul style="list-style-type: none">◦ powerful client◦ allows for integration (YouTube, Soundcloud, etc.)◦ User modifiable (CSS) | <ul style="list-style-type: none">• Easy to use, with an interface most anyone can understand.• Free and relatively fast syncing of files even with the most basic plan.• Graduated pricing levels fit the needs of individuals and smaller organizations• Robust photo and video presentation and sharing, including HTML5 streaming. |

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| | <ul style="list-style-type: none"> • Search <ul style="list-style-type: none"> ◦ most things are searchable ◦ /s <query> ◦ context around search can be searched ◦ canonicalization is allowed (i.e. testing → tests) • Digital image/icon support <ul style="list-style-type: none"> ◦ Full Emoji ◦ Emjoi = a small digital image or icon used to express an idea, emotion, etc in electronic communication • Archive importing <ul style="list-style-type: none"> ◦ i.e. Hipchat and campfire logs can be imported • Integration <ul style="list-style-type: none"> ◦ full integration support ◦ Services: file storage, project progress tracking, code quality check, marketing and sales. ◦ i.e. Asana, Github, Google Docs, Dropbox... ◦ Full list of integration services: https://cscwuvic2015.slack.com/services/new • GUI <ul style="list-style-type: none"> ◦ polished ◦ user friendly • Feedback <ul style="list-style-type: none"> ◦ can be sent from within client | |
| Cons | <ul style="list-style-type: none"> • Readability <ul style="list-style-type: none"> ◦ poor (i.e. in other software a single window will give you more information) ◦ Improvement: compact mode but the user will lose flow (alignment, | <ul style="list-style-type: none"> • Not a collaborative editing platform, if that's what you're looking for. • Not everyone has a strong subfolder taxonomy, so finding files can be difficult. |

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| | <p>colored names)</p> <ul style="list-style-type: none"> • Feature discovery <ul style="list-style-type: none"> ○ features are hidden (less accessible) in dropdowns/icons ○ Accessibility issue • Bot Assist <ul style="list-style-type: none"> ○ onboarding/ help process is achieved via bot ○ User may prefer to sign up via a single page versus forced interaction with a bot • Default Channel <ul style="list-style-type: none"> ○ user must belong to a single default channel ○ App can get “noisy” | <ul style="list-style-type: none"> • Limited integrations to business apps, despite a good application programming interface (API). • Lacks enterprise-class security capabilities and has had a few security blunders here and there. |
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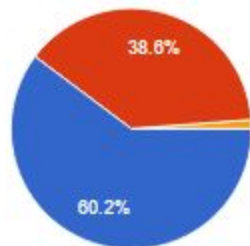
Survey Results

1) What is your age?



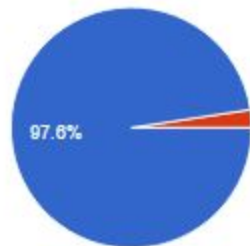
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|-------|----|-------|
| 12-17 | 0 | 0% |
| 18-25 | 57 | 68.7% |
| 26-35 | 16 | 19.3% |
| 36-65 | 7 | 8.4% |
| 65+ | 3 | 3.6% |

2) What is your gender?



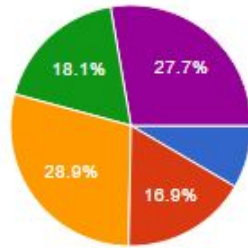
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| Male | 50 | 60.2% |
| Female | 32 | 38.6% |
| Other | 1 | 1.2% |

3) Do you use software as team collaboration tools?



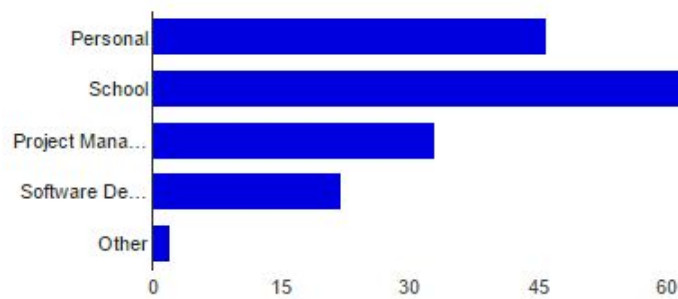
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| Yes | 81 | 97.6% |
| No | 2 | 2.4% |

4) How often have you used these collaboration tools in the past month?



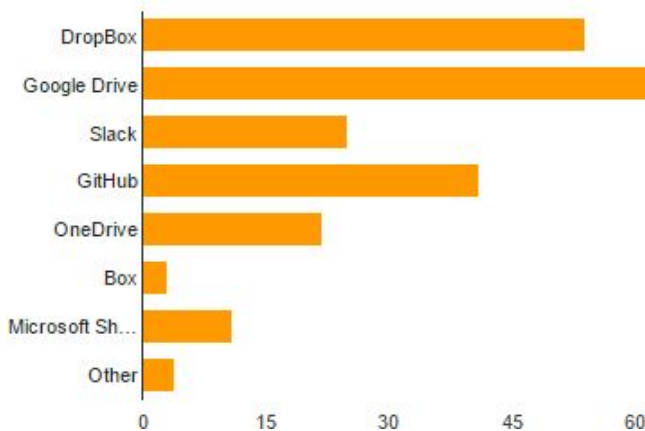
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| Never | 7 | 8.4% |
| Monthly | 14 | 16.9% |
| Weekly | 24 | 28.9% |
| A few times a week | 15 | 18.1% |
| Daily | 23 | 27.7% |

5) What are your main uses for software collaboration tools?



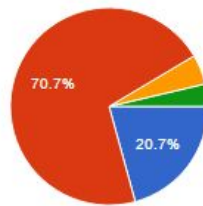
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| Personal | 46 | 56.8% |
| School | 67 | 82.7% |
| Project Management | 33 | 40.7% |
| Software Development | 22 | 27.2% |
| Other | 2 | 2.5% |

6) What software collaboration tools do you use?



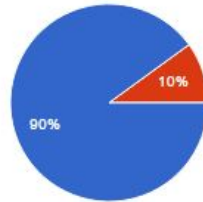
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| DropBox | 54 | 65.1% |
| Google Drive | 70 | 84.3% |
| Slack | 25 | 30.1% |
| GitHub | 41 | 49.4% |
| OneDrive | 22 | 26.5% |
| Box | 3 | 3.6% |
| Microsoft Sharepoint | 11 | 13.3% |
| Other | 4 | 4.8% |

7) How many people do you typically work with on a team project?



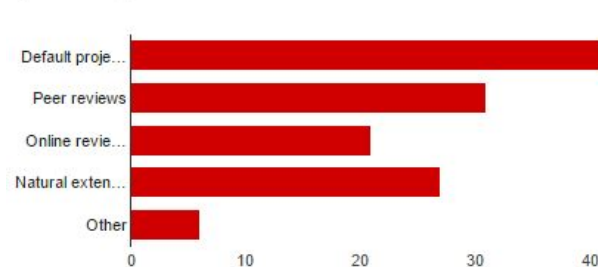
| | | |
|--------|----|-------|
| 0 - 2 | 17 | 20.7% |
| 3 - 5 | 58 | 70.7% |
| 6 - 10 | 4 | 4.9% |
| 11+ | 3 | 3.7% |

8) How much do you spend on team collaboration tools per month?



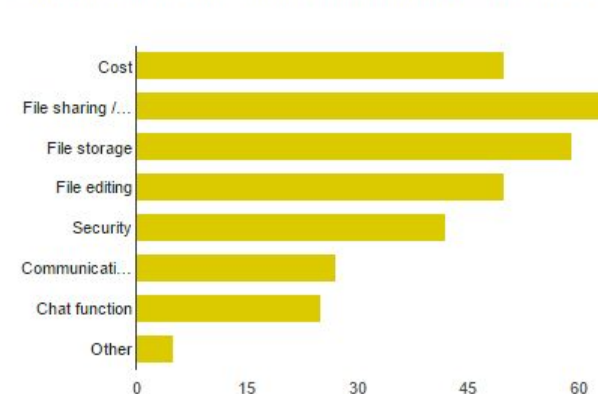
| | | |
|---------|----|-----|
| Nothing | 72 | 90% |
| Other | 8 | 10% |

9) How do you decide which team collaboration tools to use?



| | | |
|--|----|-------|
| Default project tool | 41 | 50.6% |
| Peer reviews | 31 | 38.3% |
| Online reviews/discussion | 21 | 25.9% |
| Natural extension of your software ecosystem | 27 | 33.3% |
| Other | 6 | 7.4% |

10) What features in a team collaboration tool are most important to you?



| | | |
|--|----|-------|
| Cost | 50 | 61% |
| File sharing / Cloud availability | 65 | 79.3% |
| File storage | 59 | 72% |
| File editing | 50 | 61% |
| Security | 42 | 51.2% |
| Communication (i.e. video and audio calls) | 27 | 32.9% |
| Chat function | 25 | 30.5% |
| Other | 5 | 6.1% |

Out of the 83 participants who were invited to take the survey, 50 male and 32 female, 81 use software as team collaboration tool, 97.6 percent. As a general rule of thumb, rates higher than 50% suggested soundness. Rates lower than 30% may indicate problems. A 97.6% of our result is considered high, high rates mean that participants

have used some kind of collaborative tools in the past, more likely will use again, and generally have a some knowledge of how to use. 91.6% of respondents have used collaboration tools at least once in the past month mainly for school and personal use however, some respondents also use these tools in a project management or software development context. The most popular software collaboration tools were Google Drive, DropBox, GitHub, Slack, OneDrive and SharePoint. Most tools were chosen because it was either the default project tool, through word of mouth or it was just a natural extension of the respondent's software ecosystem (i.e use Google Drive because he/she has a Gmail account). Our survey participants stated that file sharing and/or cloud availability is the most important feature most likely due to increase in mobile devices and importance of on-demand access. File storage, editing and cost were the next most important features respectively. Interestingly, security and communication/chat features were deemed least important. This could be due to the fact that the majority of survey participants could potentially be students and other academics where these aforementioned features aren't deemed as important. Whereas if more working professionals were to respond, we hypothesize that security and communication features could be mission-critical.

Team Roles

There are multiple aspects of this project that will need focus. Our project can be divided into four stages:

- Stage 1: Literature Review and project design
- Stage 2: Software Evaluation
 - Conduct Surveys: questions included a look at user demographics, collaboration tool preferences, and user
 - Evaluate current features of dropbox
- Stage 3: Software Comparison
 - Compare and contrast with Google Drive, Slack, GitHub, Box, OneDrive, and MS Sharepoint using
 - Examine features of DropBox needing change/integration
- Stage 4: Software re-design
 - Design Dropbox with new features
 - Create a mockup and prototype using Photoshop and Invision

Brenda and Emily will focus on the preliminary and extensive literature review, the ethics application, and the software comparison. Jason and Adnan will focus on

surveying students and analyzing the results.. Meric and Frances will undertake the Dropbox redesign and prototyping as well as the user testing and evaluation. Finally, each group member will be responsible for taking care of their personal work logs, helping with each proposal, assisting with oral presentations, and creating the final report.

Team Milestones

Our team has collaborated and decided on the most effective milestones to suit our project needs over the course of the next 8 weeks (Figure 1). Thus far, we have completed all milestones colored red.

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 |
|---|-----------|------------|------------|------------|------------|------------|------------|------------|
| | Oct.14 | Oct. 21 | Oct. 28 | Nov. 04 | Nov. 11 | Nov. 18 | Nov. 25 | Dec. 02 |
| Preliminary lit review; Oral presentation and written proposal | | | | | | | | |
| Preliminary Work - Literature review, requirements, evaluation, design | | | | | | | | |
| Ethics Application; Present Progress Report | | | | | | | | |
| Gather and Evaluate Student Survey Data | | | | | | | | |
| Software design and prototype | | | | | | | | |
| Prepare Final Report | | | | | | | | |

Figure 1. Milestones

Risks

We understand that we will encounter a variety of risks as a collaborative group. The first and primary risk that we plan to encounter has to do with time limitations. Our project is very large in scope and we have a narrow timeframe within which to complete it. If we do not stick closely to our proposed team milestones, we run the risk of not adequately completing a component, or not completing our project on time. As busy post secondary students, we may find it challenging to complete our individual tasks both on time and to an appropriate level of satisfaction. In order to mitigate this risk we will be keeping work logs and holding our teammates accountable at weekly meetings (physical or online). Our second risk involved group dynamics. We all come from very different cultural backgrounds and have found thus far (even though very early in the project) that we have very different working styles because of this. We will have to work very hard to overcome this risk as it is something that is ingrained inside of this as opposed to a behaviour with an external influence. An additional risk will be the use of varying communication tools. We have decided to use a handful of core technologies for communication throughout the project (GitHub, Box, Google Drive, Dropbox, Onedrive, MS Sharepoint, and Slack). Some group members are not fully familiar with all of the software that we will be using and have different levels of comfort and expertise using them. This will be a hurdle that we will overcome by making sure each member is asking questions, using the software as much as possible, and receiving help from more experienced members. A risk that we see arising down the road will be meeting environment; that is, whether we will be meeting face-to-face or online. We have decided that the best approach to this issue will be to do both - to meet online when we can, and to meet in person when we are able. Again, our working styles all differ so some members work better in person while other work more effectively asynchronously and/or online. Finally, we must be astutely aware of our project scope. Thus far, we have managed to narrow our design down but it may require further tampering to reach an appropriate scope that is not too large. In summary, our varied backgrounds will allow us to actively challenge these risks head on and communicate to each other openly about what is and is not working for our group. One risk suggested by Dr. Storey was that Dropbox may not have any features to improve upon. Thus far, we have found multiple features that need to be improved and/or modified for more efficient ease of use. A risk that we were faced with was whether or not we would get survey responses. We were lucky thus far to get 83 responses and may include more. An additional risk we may encounter will be whether our design will be better, or if it will introduce a new host of issues and usability errors. We will evaluate our mock-up based on the software considerations proposed by Olsen and Olsen (2014).

Expected and Uncovered Results and Contributions (Impact)

We expect to find results that will have an impact on researchers and academics, designers and business or “power” users. While our results will have an impact on individual home users as a side effect, our focus will be on improving the user experience for designers and researchers (those actively working in CSCW). We expect that the results from our project will have an impact on influencing CSCW software designers to improve their software and to want to use DropBox as a model on which to reference their software. This would both improve CSCW participants communication and would also reduce the cost of utilizing multiple tools. Our focus for researchers and academics will be to provide a single tool that will meet all of the team’s design and communication needs and will reduce the need for multiple tools. For example, we would like the redesigned dropbox to have both video and audio communication functionality, features which are currently missing.

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