

# myLiveNotes Competitor Analysis

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# Academic Competitor Analysis

## Skim for Mac

Skim is a PDF reading application for Mac. It is similar to the native application, Preview, but has many more features designed specifically for academic reading. Skim only accepts PDF documents.

### Tools

- Note creation-- notes are anchored to the location in the document, and can be clicked in a sidebar to return to the original location. There are floating notes and anchored notes. Notes can be exported as RTF with a page number associated with the note;
- All annotations are displayed in the sidebar;
- Highlighting-- highlighted text is shown in the sidebar and can be clicked to return to original location. Highlighted text can be exported as RTF;
- Shapes-- ability to add a circle, box or line. The text within the circle or box is extracted and kept track of in the sidebar. Shapes can have different styles (lines can have single arrow, double ended arrow, etc). All shapes can be made in different colours;
- Strikeout and underline text;
- Select tool-- can use a rectangular marquee to select sections of the document, or can select text without highlighting it;
- Table of contents sidebar-- can navigate to headings or pages within the document, or can view document by thumbnails;
- Bookmarks;
- Zoom, pan, forward/backward buttons, split view, full screen, presentation mode
- Search document for text, or search annotations;
- Convert an already highlighted document into "Skim notes" highlights so they can be exported or searched.

One of the main advantages of Skim over Preview is that it indexes the annotations and can export all annotations to an RTF file. This is probably the most advanced feature, and was the reason I downloaded and used this application this past year. When engaging in academic reading, many people highlight but then have no way to extract or manipulate the highlighted information. Skim is one of the few programs that supports this.

### Navigation

Skim has a variety of navigation tools. The table of contents and thumbnails all link to the corresponding parts of the document. There can be single page, single page continuous, two pages or two pages continuous, all with or without page breaks displayed. The ability to click on annotations in the sidebar and be taken to the original context also greatly supports navigation.

### Usability

Skim looks like Apple's Preview, so it is familiar in interface but with more tools available. It is simple to use, yet extensive. Skim only works on Mac though, so when I wanted to highlight documents on my iPad, I would have to convert the annotations in Skim for the annotations to be readable. Skim made this process easy, but it would have been nice to

have Skim on the iPad as well. One feature that is lacking in Skim is a space to create notes that aren't attached to the text, as MyLiveNotes does.

## Sharing

Skim does not support collaborative annotating. The only way to share a document would be to save it or export it as a PDF, a Skim document, or just export the annotations as RTF. This is where MyLiveNotes could beat Skim.

## What can MyLiveNotes learn from Skim?

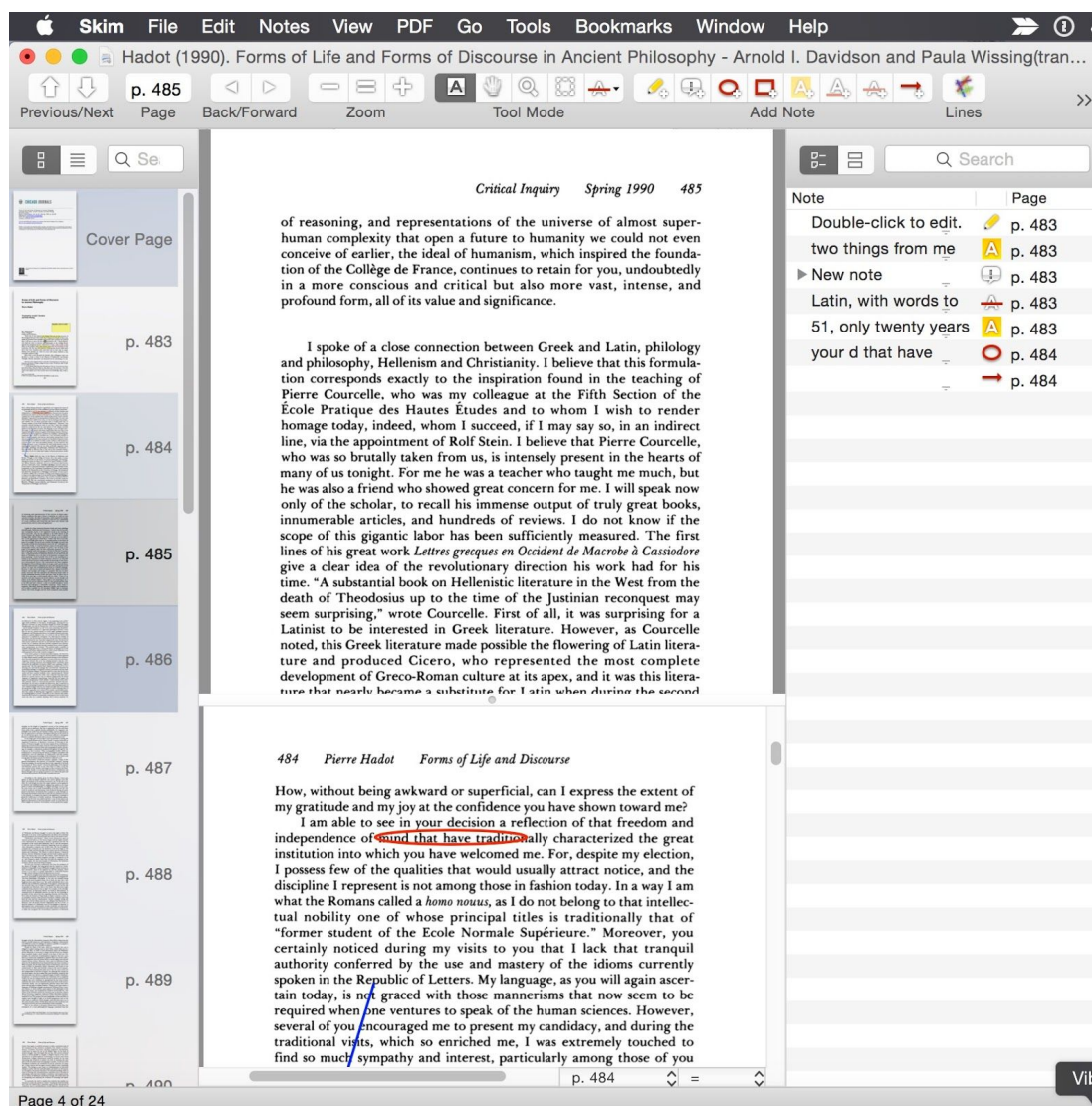
The ability to import a document that has annotations such as highlights, and then convert the highlights into searchable, exportable text is an extremely useful feature that MyLiveNotes could consider implementing.

## Is Skim currently in production/being used?

Yes

## Is Skim in direct competition with MyLiveNotes?

Yes



## **XLibris**

The article on XLibris was published in 1999, after an initial study done in 1998. As of 2015, it does not appear that XLibris is in production or use. Consequently, the technology used in the study is very outdated: i.e., a tablet that weighs 5.5 pounds, tethered to a PC. Yet XLibris was one of the first of its kind to examine and support academic reading contexts, so it warrants investigation.

Because XLibris was limited by the technology of the time, certain features were unavailable in the system which are now considered critical to a successful academic reading system. One such example is the ability to add comments other than the physical margin of a page. The documents read on XLibris were scanned from paper copies, and therefore did not offer any further space for annotations and notes than what was provided by the physical page.

XLibris also did not provide a bookmarking system, and required users to navigate away from main content to view a reference without the ability to view content and reference side by side.

XLibris had a Reader's Notebook feature, which gathers annotations into a list, but the study cited problems with this function since many users had a tendency to over-highlight, which made the Reader's Notebook redundant.

### **Navigation**

Navigation in XLibris is linear and does not support side by side viewing of multiple pages. This was a big restriction as some users in the study stopped checking references because the process of switching pages was so cumbersome.

### **Annotation**

Annotation in XLibris does not significantly differ than the annotation tools available on paper. The only advantage of XLibris over paper was the automatically generated list of annotations, and the ability to erase annotations.

### **Sharing**

There were no indications in the study that XLibris allowed collaborative annotations or easy sharing of annotated documents. This also could be due to the technological limitations. In fact, the entire study was based on users annotating their documents using XLibris, but then printing out the annotated documents. In this sense, XLibris cannot accurately be compared to MyLiveNotes or any other academic reading system of 2015.

### **What can MyLiveNotes learn from XLibris?**

Some readers responded by saying that they should be able to view the citation for a reference without navigating at all, by having the citation pop up when desired. MyLiveNotes should create an easy, fast way to switch between annotation methods. One user in the XLibris study wrote notes with the highlighter tool instead of switching to the pen tool. According to another study that was cited, there is "a decided preference for the implement that is already in hand."

The ability to edit a Reader's Notebook-like feature, where the user can specify which annotations to keep or remove in the notebook from the automatically generated list would be an improvement.

**Is XLibris currently in production/being used?**

No

**Is XLibris in direct competition with MyLiveNotes?**

No

## nStudy

nStudy is a web applications for use in Firefox. The idea behind the design was that professors would either create or find an existing HTML file for academic reading for students to annotate. nStudy was specifically designed to gather detailed, time-stamped data about usage of the system to learn how users study online material, and therefore is more of a research tool than a functional academic reading system. One of the biggest limitations to nStudy is that it only takes HTML files, and does not support Word documents or PDFs.

### Tools

- Tags-- includes highlighting, tagging highlighted text with cue words;
- Note creation-- the ability to add notes to a section of the document, and provides custom note format such as forms/questions;
- Terms-- automatic creation of terms list from document, automatic hyperlink between terms;
- Chat between users-- standard text chat, can have roles assigned (planner, evaluator, leader), chats can be annotated;
- Concept Map-- build maps from scratch by creating notes, terms, bookmarks and other nStudy items, then linking, grouping and spatially arranging them;
- Document Composition-- users can write essays, poetry, lab reports and other text documents using HTML formatting tools within the web application;
- Library-- a list of every annotation. Includes a search tool
- Private and shared workspaces-- allows collaboration between users on a single document, ability to share private workspaces with others
- Data logs-- system logs functions the user performs, analyzes to produce script: make new note, review term, modify concept map and so forth.

### Navigation

Navigation seems to be overly complex in nStudy, where the system attempts to automatically generate key terms in the document, and then hyperlink them all to produce a web of references. Usability consequently suffers, as navigating many annotations, terms and tags becomes convoluted.

### Sharing

Sharing is a strong aspect of nStudy. The study describes three ways users can work on documents collaboratively: “(a) sequential collaboration where work is circulated to and augmented by team members; (b) convergent collaboration where each members’ work is exported from individual workspaces into a shared workspace where it is compiled and organized by the team; and (c) emergent collaboration in a shared workspace where all collaborative planning and work occurs” (*nStudy: Tracing and Supporting Self-Regulated Learning in the Internet*, 2013, p.302).

These sharing features are supplemented by the chat feature, so that users can easily discuss annotations without having to use an external protocol in order to communicate.

## Usability

nStudy has a weak user interface which makes it harder to use, understand and keep track of all the available tools. This was pointed out in the results of the study: "Early usability testing revealed that learners commonly avoided these cognitively effortful judgments about tags—they just wanted to highlight." (305)

nStudy was designed for a different purpose than MyLiveNotes. nStudy's features are multitudinous and complicated, but the system only supports HTML files and is only available on Firefox, making it much more limited than MyLiveNotes.

## What could MyLiveNotes learn from nStudy?

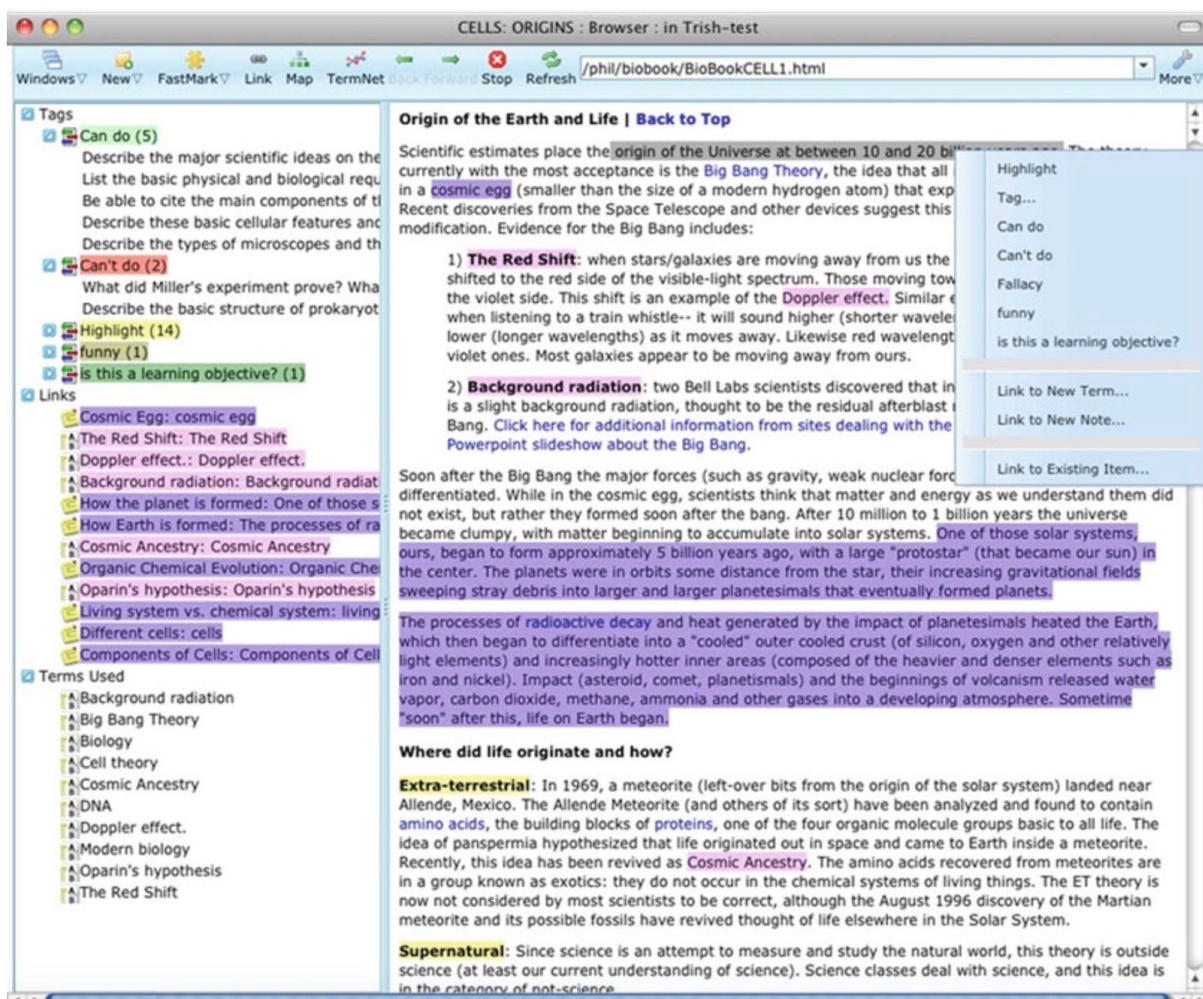
A chat feature would be useful in MyLiveNotes. A strength of nStudy was the ability to share documents for collaborative work, which MyLiveNotes could emulate.

## Is nStudy currently in production/being used?

No

## Is nStudy in direct competition with MyLiveNotes?

No



# Digital Reading Desk

Digital Reading Desk was designed to imitate a physical desktop in a digital environment. The idea was that users would have a 'pile' of unlimited 'Post-it note' text boxes of various sizes on the side of their reading space, that they could drag to attach to different parts of a PDF. The Post-it note would act as either a bookmark (it would display as sticking out the side of a page) or a written comment on the page. These annotations would not be visible on one page if a user switched to the next. Similarly, annotations can be placed on the 'desk area' surrounding the document, including behind the front and back covers.

## Annotation

The Post-it note bookmarking and comment creation is the only significant annotation feature of Digital Reading Desk. There is no highlighting capability, which is a huge drawback. As well, screen real estate is limited, and by including extra space for notes to be placed around the document, there is less room to view the document itself. This concept goes against the MyLiveNotes Constraint #3: "MLN will assume nothing about page width or text size, annotations will appear near their targets without relying on bitmap or pixel information." Here, MyLiveNotes has a clear advantage.

## Navigation

Navigation in Digital Reading Desk emulates navigation through a physical document or book, by having a two-page spread and flipping the page one at a time. This kind of navigation is keeping with the physical page metaphor that MyLiveNotes is trying to move away from. There is much wasted space in Digital Reading Desk's layout from displaying fixed-size margins and navigating horizontally as opposed to vertically.

## Sharing

The study did not mention any forms of sharing the annotations or working collaboratively.

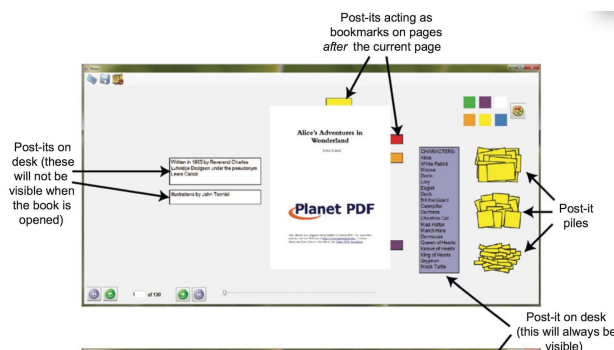
Digital Reading Desk proposed an interesting idea on how to digitize Post-it notes, but its features and development are largely irrelevant to MyLiveNotes.

## Is Digital Reading Desk currently in production/being used?

No

## Is Digital Reading Desk in direct competition with MyLiveNotes?

No



## PapierCraft

The PapierCraft system is built around the use of a digital pen to mark up paper printouts of documents, which are then synchronized with a digital version of the document. PapierCraft only supports PDFs. There are an array of gestures, mimicked after traditional editor marks, to digitally manipulate the content.

### Tools

- Copy and paste a selection of text;
- Cropping an image;
- Underlining text/selecting several lines of text;
- Lassoing an arbitrary document area;
- Stitching-- two adjacent paper sheets will be stitched together in the digital view, or pin a Post-it note on the document;
- Creating links to other documents;
- Tag with keyword-- assigns a keyword to a specific area of a document;
- Freeform annotation-- highlighting, handwriting comments, underline, strikethrough, etc;
- Email a section of text to an address;
- Search Google for this text;
- Create collages of different snippets;
- Delete a command after finishing it.

PapierCraft also can be used simultaneously with a computer in order to annotate documents in real time, but the study did not go into detail about this feature.

### Usability

The structure of the PapierCraft system is different than MyLiveNotes because it relies on physical paper and a special pen in order to annotate a document. It also requires that documents already have digital copies, synced to a PapierCraft server. Where MyLiveNotes is trying to move towards the idea that reading does not happen on only one device or technology, PapierCraft is restricting the scope of available technologies to use in academic reading contexts.

### Sharing

Annotated documents can be shared after they are imported to the computer, but there does not seem to be a way to collaboratively work on annotating a document.

PapierCraft's features seem more like features found in Photoshop than in an annotation tool. There are two steps in the PapierCraft system: 1) annotate a paper document, 2) sync annotations with digital version, which can then be searched, navigated and shared. The study did not go into detail about the organization of the annotations on the computer, and instead mainly focused on the gesture system to be used with the pen. For this reason, it is hard to compare MyLiveNotes to PapierCraft.

**Where can MyLiveNotes beat PapierCraft?**

PapierCraft requires users to have a special digital pen, digital copies of all documents, a printer, and special paper to print documents on. Many users will not want to have to print out all their documents in order to annotate them, and also might not want to waste paper when the ultimate goal is to use the digital version of the annotated document.

MyLiveNotes offers a more accessible and adaptive system, whereas PapierCraft is more of a novelty.

**Is PapierCraft currently in production/being used?**

No

**Is PapierCraft in direct competition with MyLiveNotes?**

No

## Smarticle

Smarticle was developed by Wouter Walmink as a graduate studies project. In its current form it is a prototype with limited functionality. It does not appear that the developer plans to take this project further, and so poses little risk to competing with MyLiveNotes.

The prototype was designed specifically for reading groups who want to collaboratively annotate a document, but the interface would also be suitable for individual use.

### Tools

- Annotation/note-taking with the ability to tag different categories;
- Hyperlinking within document: references, figure numbers, sections are all clickable and either scroll to the section or display the reference content in a sidebar;
- Summary of all highlights;
- Two optional, customizable sidebars for display of notes, table of contents, references, and collection of all images/figures in the text;
- Group annotations.

### Navigation

The prototype document has a hyperlinked table of contents, where the user could see all headings and sections of the document and click on them to scroll straight to that section. The footnotes within the text are also hyperlinked, and display the full reference in one of the sidebars without navigating away from the context. The table of contents can also be displayed in one of the sidebars at any time, without navigating away from the main text.

Overall, the navigation was done very well. This is one of the ways Smarticle is in direct competition with MyLiveNotes.

### Annotation

Annotation is generally straightforward. When text is selected, it can be highlighted with or without a corresponding note, and can be tagged in different categories. The kind and amount of tags for the annotations are presumed to be user defined, and the prototype offers a useful feature of being able to select which tags of annotations are displayed.

### Sharing

By default, Smarticle shows all annotations by peers in the document. The annotation tags can be filtered, so if a user wanted to see only what peers were “critiquing” or “questioning” about the document, they would be able to display only those comments. It is not clear how sharing would occur, whether it would be real-time collaboration or whether the document would be sent from peer to peer.

### Usability

Smarticle can display all the highlights or annotated sections in one summary. The most useful part of this feature would be if this summary could be exported or edited with supplemental notes. In this prototype, exporting the annotations was not supported.

## Weaknesses

Icon ambiguity: It was not clear what each icon is supposed to do. The icon images do not translate into known metaphors, so I was only able to determine the function of each button by clicking on it as well as reading the description from the main page.

Interface too customizable: There are no restrictions on what section can go in the sidebars, which means that a user could have the table of contents open on both sidebars at the same time. For power users, this scope of customization might be useful and welcomed, but for average users it might get too confusing.

## What can MyLiveNotes learn from Smarticle?

The layers of tagged annotations, which could be turned on and off, looks like something MyLiveNotes is trying to implement and this would be worth investigating. As well, having everything (figures, references, headings) linked within the document helps significantly with navigation. A summary of annotations is a key feature, but the ability to export the annotations would be a huge improvement. Smarticle supports MyLiveNotes' design principle of "reading does not happen one page at a time". Smarticle reformats a traditional two column academic paper into a scrollable, clickable, interactive document. MyLiveNotes could also consider the idea of reformatting documents to get rid of the 'outdated notion' of the page and introduce a more interactive reading venue.

## Is Smarticle currently in production/being used?

No

## Is Smarticle in direct competition with MyLiveNotes?

Yes

The screenshot displays the LaserOrigami web application interface. The main content area is titled "LaserOrigami: Laser-Cutting 3D Objects" and features a document with the following sections:

- REFERENCES**: A list of five references, including "Laser Forming of Thin Metal Components for 2D and 3D Applications Using a High Beam Quality, Low Power Nd:YAG Laser and Rapid Scanning Optics" by Bartkowiak, K., Edwardson, S.P., Borowski, J., Dearden, G., Watkins, K.G., and "Introducing robotic origami folding" by Balkcom, D. J., Mason, M. T.
- ABSTRACT**: A paragraph describing the LaserOrigami system, highlighting its speed and the use of folding and stretching to achieve three-dimensionality.
- INTRODUCTION**: A paragraph stating that rapid prototyping is a key technique in design process that allows "getting

The right sidebar contains a "notes" section with a "CRITIQUE" and a "REFLECTION" section. The "CRITIQUE" section includes a note by Claire Johnson: "If we can get a better understanding of this work, that would be great." The "REFLECTION" section includes a note by Simon McCartney: "The way this is worded, reminds me of a book I read a while ago. It works well." and a note by Charles Atkinson: "Was it 'Laser cutting for beginners?'". The "CRITIQUE" section also includes a note by Wendy Williams: "I think it was 'The Tale of the Little Laser Cutter'".

## United Slates

United Slates is a multi-tablet system for academic reading. The system comprises four custom e-ink tablets with styluses, which are connected to a cloud document storage server. Documents can be sent to any of the slates or to the PC, and changes made on one device immediately appear on another.

### Tools

- Pen input;
- Freeform ink annotations-- highlighting, underlining, commenting, etc.;
- Universal clipboard across slates and PC;
- Rapid page switching-- the user has the ability to quickly jump to any page to see it in detail;
- Stitching;
- Remote control to control far away slates;
- Proximity links between slates to create a two-page, side-by-side view of a document with synchronized page turns;
- Slates can be controlled from a PC;
- Non-sequential navigation;
- Tagging documents/filtering tags;
- Note-taking in margins with margin expansion;
- Blank notebooks-- pages where users could write notes or copy and paste excerpts from documents, which would link back to the original content;
- Send hyperlinks (references, webpages) to another slate to view side-by-side so that the user does not have to navigate away from original content.

### Navigation

One of the main features that United Slates was trying to address was supporting navigation activities. There are single page views, where the hard buttons turn the pages; a thumbnail view for viewing all pages in the document and then clicking on one to navigate to that page; a stack view which shows a list of recently opened documents in order to navigate to them faster; and a library view of all documents on the slate, which can be filtered by tags.

Navigation is supported by the near-instant synchronization of annotations across slates, as well as the proximity link capability. Navigation is also enhanced by the ability to control the slates from a PC, where a user can load a document onto a slate and navigate to a certain page for it to be ready for reading (or conversely, loading a page from a slate onto the PC).

### Sharing

This study focused on the applicability of a system for an individual, and so did not go into detail on how the system would work between users. But given the current functionality of the system, it would not be hard to imagine that real-time collaborative editing of a document would be straightforward and effective. The requirement would be that a second user have another set of slates to use.

### Usability

The idea behind the use of multiple tablets was that each tablet is useful by itself, but the integration of the tablets provides increased usability. One of the most advanced features is

the universal clipboard, where text copied on one slate is available on another slate or on a PC. The variety of available configurations supports usability and allows users to adapt the system to their note-taking style.

### **Annotation**

Because the slates accept freeform ink annotations, the user is free to decide what kind of annotations to use-- highlighting, underlining, strikethrough, shapes, commenting, etc., as these are not restricted by a mouse input device, as on a computer. The margin expansion feature is significant, as it maintains the marginalia metaphor from paper, but removes the limitation of space. This is the same idea as MyLiveNotes' guiding principle that the physical page is an outdated notion of document separation.

### **What can MyLiveNotes learn from United Slates?**

If MyLiveNotes is planning on implementing a system where a user annotates a document on a tablet at the same time as using a PC, then this system offers much to learn from. In its current form though, it is hard to compare MyLiveNotes with United Slates as the functionality of the systems are quite different.

### **Is United Slates currently in production/being used?**

No

### **Is United Slates in direct competition with MyLiveNotes?**

No



## LiquidText

LiquidText looks like the most significant competitor to MyLiveNotes so far. LiquidText is a tablet application (about to be released for iPad) which combines document annotation with note-taking. LiquidText can import any kind of file-- Word document, PDF, webpages, PPT, etc. There is a workspace on the right of the document, which allows for free text notes and excerpts from the document.

### Tools

- Text/content extraction;
- Highlighting in different colours;
- Anchored and unanchored notes;
- Huge workspace for notes;
- “Collapsing” a document in order to view two or more sections at once;
- Transient bookmarking;
- Summary of highlights;
- Document search;
- Export as annotated PDF or RTF notes;
- Import documents from Dropbox, Google Drive, Box, iCloud, Safari.

### Annotation

LiquidText does not allow for freeform ink annotations, nor does it allow for drawn shapes. There is no ability to tag annotations with keywords, but highlights and comments can be different colours (system-defined colours).

### Usability

LiquidText is interesting because it allows a user to highlight a section of the document and drag it to the workspace. This creates a little bubble in the workspace with the content from the document (text, image, section, etc) that has a link to the original context. These bubbles can be moved around the workspace, grouped together, commented on, and exported as RTF notes.

### Navigation

An interesting feature of LiquidText is the act of “collapsing” a document in order to view two or more sections at once. The user pinches the document in order to squeeze together the middle section of the document, which is displayed as condensed text. This function can be performed multiple times so that different sections of the document can be displayed in one view. There are also scroll bars on the left side of the document in order to facilitate easier scrolling and location awareness.

### Sharing

Annotated documents can be exported as LiquidText files, PDFs or RTF notes. Otherwise, there are no specific sharing features for collaborative annotation.

## What can MyLiveNotes learn from LiquidText?

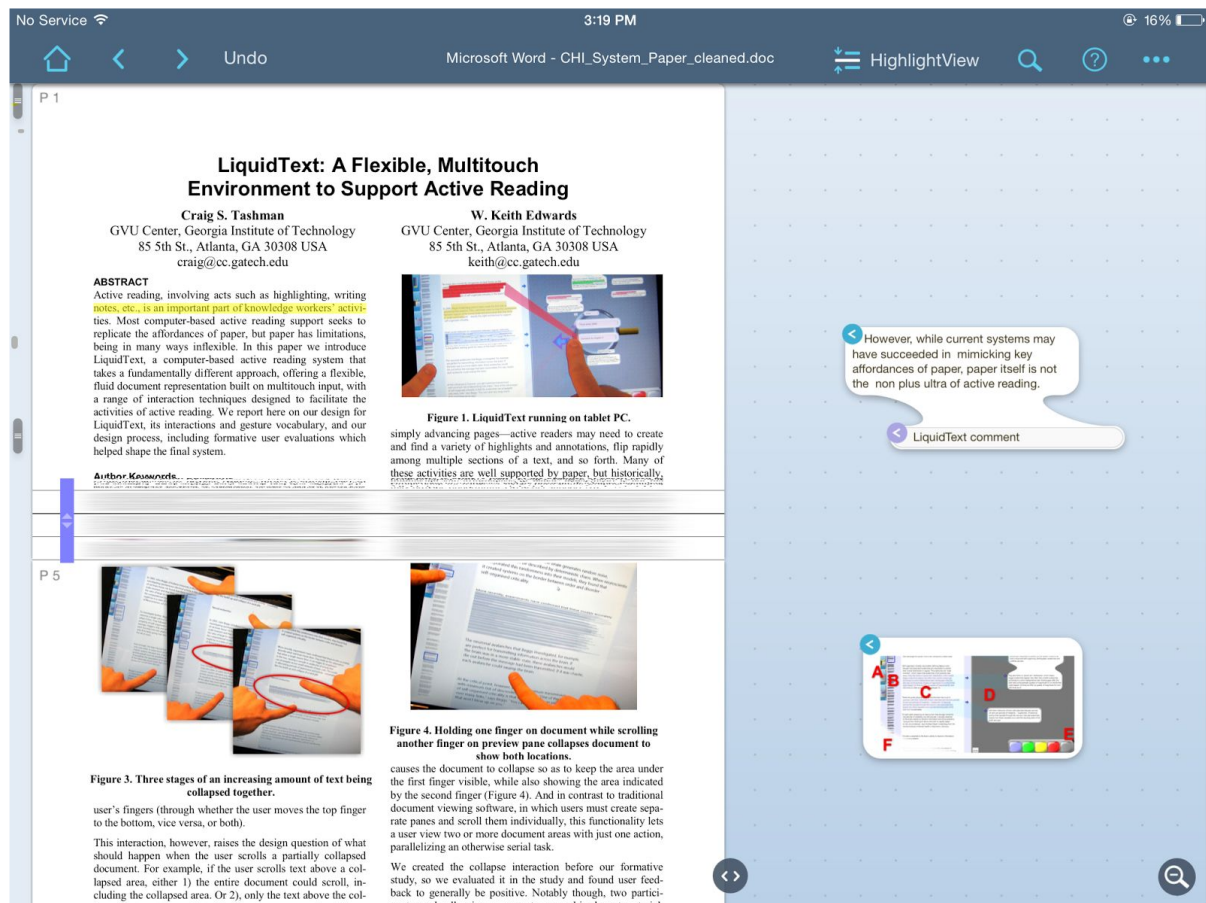
LiquidText makes annotating documents fun. None of the tools in LiquidText are original, but their implementation is. While not one of the most exciting features, MyLiveNotes should definitely consider allowing Dropbox/Google Drive/iCloud sync of the documents.

## Is LiquidText currently in production/being used?

Yes, they are about to release an iPad app.

## Is LiquidText in direct competition with MyLiveNotes?

Yes



# Google Docs

Google Docs was originally viewed as a competitor to Microsoft Word.

## Tools

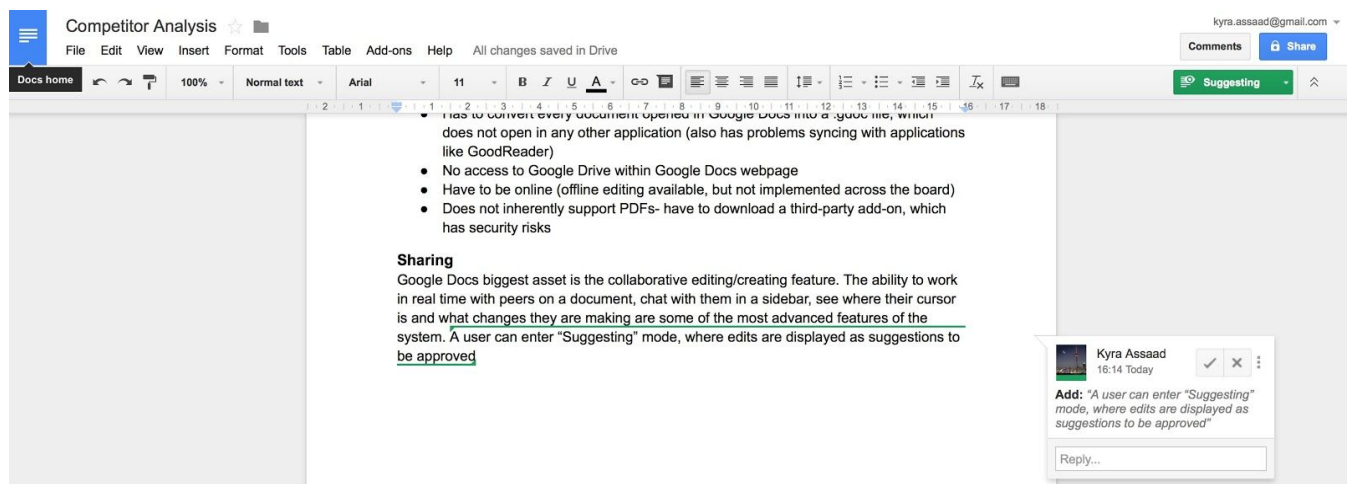
- Document creation-- many of the same features as Microsoft Word;
- Collaborative document editing and creation;
- Track changes;
- Access to hundreds of add-ons that add functionality (table of contents creator, citation format creator, etc);
- Automatic saving;
- Documents are synced to Google Drive;
- Commenting.

## Weaknesses

- Has to convert every document opened in Google Docs into a .gdoc file, which does not open in any other application (also has problems syncing with applications like GoodReader);
- No access to Google Drive within Google Docs webpage;
- Have to be online (offline editing available, but not implemented across the board);
- Does not inherently support PDFs-- have to download a third-party add-on, which has security risks.

## Sharing

Google Docs biggest asset is the collaborative editing/creating feature. The ability to work in real time with peers on a document, chat with them in a sidebar, see where their cursor is and what changes they are making are some of the most advanced features of the system. A user can enter "Suggesting" mode, where edits are displayed as suggestions to be approved. Other users can comment on these suggestions. This might be a useful feature that MyLiveNotes could implement for collaborative work.



## **Annotation**

As a note-taking and annotation tool, Google Docs is not a significant competitor. For text documents, text can be highlighted and extracted, but the Google Docs interface is geared more towards content creation as opposed to annotation. Google Docs does not accept PDFs, but provides the platform for the third-party apps that do support PDF annotation to run. There are too many add-ons available to do a significant competitor analysis.

## **Usability**

As a content creation tool, Google Docs is fairly robust for its price (free). It serves as a viable competitor to Microsoft Word as it is simple to use and, most importantly, always saves documents. As an annotation tool, it is hardly usable for annotation and note-taking on documents.

## **Navigation**

When editing a document, navigation is simple, but looking at the available documents to edit is more confusing. The Google Docs Home Page shows all Google Docs files ever opened, organized by Date Last Opened. This is difficult to navigate when users primarily use Google Docs in connection with Google Drive. It is unintuitive to use the “document picker” button to display Google Drive contents. Navigation within the Google Docs/Google Drive system is too complex.

## **What can MyLiveNotes learn from Google Docs?**

MyLiveNotes can learn from the commenting/suggesting system in Google Docs. The sidebar chat when editing collaboratively is a useful feature as well.

## **Is Google Docs currently in production/being used?**

Yes

## **Is Google Docs in direct competition with MyLiveNotes?**

No

## Summary

What seems to be common across these academic reading systems is the feature of tagging. This means being able to tag either comments, highlights or specific portions of text with keywords, and then having those tagged annotations extracted and organized by keyword. This is one feature MyLiveNotes should seek to implement.

Creating links to other documents within documents is another popular feature. It might be interesting to conduct user research to determine whether this would be a useful feature to implement in MyLiveNotes.

The most significant academic competitors to MyLiveNotes are LiquidText, Skim for Mac, and Smarticle. These systems have the most advanced features that are similar to MyLiveNotes'. Since Smarticle was a graduate studies project, it does not appear to be in production and so does not pose as a great a risk to MyLiveNotes, but LiquidText is about to release their iPad app, and so should be considered the primary competitor from this list.

## Commercial Competitor Analysis

## Adobe Acrobat

Adobe Acrobat does a good job of servicing business oriented users. Features unique to Acrobat from the list of software being examined for this report include form fields, and encrypted signatures/locks. If there is a key takeaway, it's that documents signed with Acrobat are generally trusted. Creating a trusting relationship between content creators, consumers, and a piece of software can be a compelling reason to use that software.

### Navigation:

The desktop app should be familiar to most people at this point. Having a scroll view of miniature pages on the left hand side of the view is a natural way to skip ahead. Papers had that to the right and it felt off. The mobile app has an unobtrusive UI where navigation information only appears when the user touches certain points on the screen, or makes a certain motion.

### Annotation:



The tools are simple and icons, except for the last one, easily identifiable. It was nice to have a feature to add text directly onto a page in addition to the “sticky note” comments. The signature button at the end probably was not necessary as part of this toolbar, but it is what separates Acrobat from the rest of the pack. One drawback is that all

### Usability:

Acrobat is easy to use and provides a consistent experience across devices and platforms. One annoying feature of the mobile app is that annotations must be saved before switching colours or line widths of the marker. It's just two extra motions, but it is a little disrupting to the workflow.

### Collaboration:

Users who pay for a subscription to Acrobat Pro can store and share files on Acrobat.com. However, they cannot work together on the same document view.

### Academic support:

None

### Strengths:

- ubiquitous
- excellent navigation
- mobile app works well for marking up documents
- document encryption
- bookmarks
- digital signature

**Weaknesses:**

- no free hand markup in desktop app
- documents limited to PDFs
- expensive for premium features (\$15/month)
- can be sluggish on older machines
- desktop app does not support resolutions of 2K+

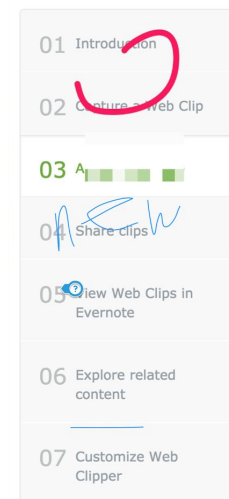
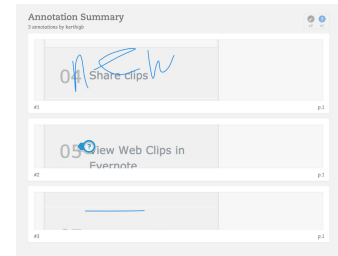
# Evernote

Evernote is a very popular note taking application. It is available on all major platforms. The application is so feature rich that it may be too complex for the average user on a daily basis.

## Navigation:

Evernote's desktop application looks like a hybrid of a web browser and word processor. Despite the overwhelming number of options that are presented to the user, the average student should be able to find what they're looking for with minimal effort.

A rather annoying part of navigating Evernote has to do with how annotations are saved. When annotating a document in the OS X app that was originally saved using the Android app, Evernote would make a duplicate of that note. To make matters worse is the annotation summary. It lists all individual annotations made from the present device ahead of the original document. This is enough of an issue for me to not use Evernote since I am constantly jumping between devices.



## Annotation:

The annotation tools provided are a real strength of Evernote. There are five simple tools provided: an arrow, text, highlight box, highlighter/marker and label. The user can change the colour and width of the tool lines.

These are the only tools I used when annotating PDF documents on the FoxIt PDF editor on my Samsung Note 10. That only provided marker and highlighter tools, and I would frequently draw boxes around text, labels, and arrows using the marker tool.



## Collaboration:

Notes and notebooks within Evernote can be shared with the press of a button, but collaborator's must also have Evernote installed to even view the documents. Documents do not get sync in real time (as they do in Google for example). A manual update was sometimes required to retrieve the latest version of a document.

An offshoot of this problem is a content creation conflict. If two people edit the same area of a document, a message appears when an attempt is made to sync called "Conflicting changes". That is the only information provided.

**Usability:**

Students are computer savvy enough to be comfortable using Evernote. It is a powerful note taking application, so it can seem overwhelming versus something like Instapaper.

However, the product seems to be reaching beyond its grasp. Real time updates are expected. This is a major hinderance that cannot be easily ignored. The confusing way in which multiple versions of a file are kept if they are edited on multiple devices is also more than a nuisance that can easily be ignored.

**Academic support:**

None.

**Strengths:**

- rich collection of features
- supported on all major devices and platforms
- consistent experience across devices and platforms
- Chrome extension works well for annotating if saved as screenshot
- annotation tools are useful, recognizable, and simple to use

**Weaknesses:**

- must install separate app (Evernote's "Skitch") to annotate PDFs on mobile devices
- always being bombarded by requests to upgrade to premium service
- HTML formatting lost when viewing a saved page. It's not suitable for annotating.
- Too many features. Is "Atlast" tab that organizes notes by location really necessary? Video notes? App store?
- virtual storage integration limited to Dropbox
- no way to capture entire website then annotate. Must take snapshots of current view.
- annotation view
- not real time

# Instapaper

Instapaper is browser extension that allows websites to be saved to a collection that can be consumed later.

## **Navigation:**

Instapaper's home view displays short summaries of the websites that have been sent to the web app. These can be organized into their own folders, or remain in the home folder. Navigating the Instapaper document view is easy since there are only six buttons on the toolbar. Each of them are recognizable icons. This view is one long scrollable page.

## **Annotation:**

Highlighting is the only form of annotation available. Multiple colours are not supported.

## **Usability:**

Instapaper is very easy to use. Web pages can be archived to Instapaper with the press of a button that appears in the browser toolbar. Organizing the pages is a matter of clicking and dragging them into folders. Highlighting text is done by selecting text, then right clicking to find the highlight option.

## **Collaboration:**

Instapaper does not have a great collaboration feature. A share button is present in document view, but all this does is allow the user to email the original web site to someone else.

## **Academic support:**

None

## **Strengths:**

- seamless web integration
- incredibly easy to use, minimalistic interface
- able to annotate any web site
- requires very little system resources
- "speed read" feature

## **Weaknesses:**

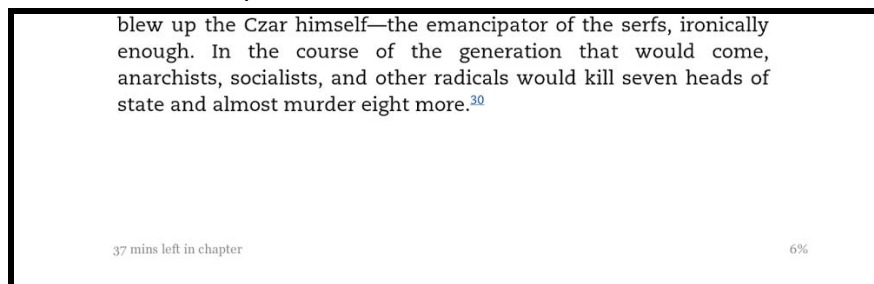
- only one annotation tool
- marked up documents cannot be shared
- only get five free highlights per month

## Amazon Kindle Reader

Aside from being a virtual bookstore, the Kindle provides some novel features for consuming written material. Although the Kindle is meant for the consumption of books, not documents, the features that stand out would lend themselves well to a document reader.

### Navigation:

The navigation is simple enough, but there are some interesting nuances that are not present on other pieces of software. Rather than display the page number on the screen, Kindle displays how much time is left to complete the current chapter, and the percentage of the total book complete.

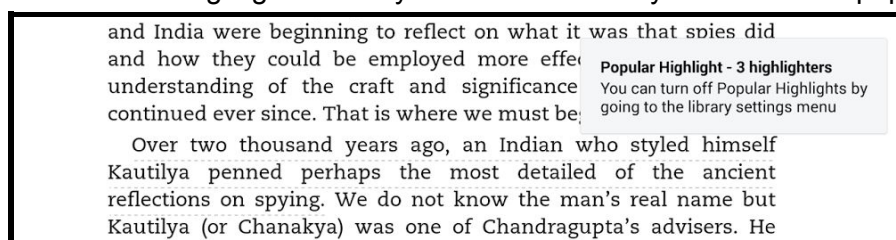


The percentage display makes sense when reading a digital document because the reader loses the sense of completeness as the stack of pages from the unread portion of the books shrinks with progress.

One missing navigation feature that would be an improvement would be a temporary place holder that allows the reader to flip between two pages with ease. Something that replicates the act of placing one's finger at one part of the book while consuming another, then flipping back.

### Annotation:

The standout annotation feature with the Kindle is the ability to see passages that other readers have highlighted faintly marked out directly in the text as "popular highlights".



This feature proves to be incredibly useful when consuming textbooks since the user might see something that they may have otherwise missed. It is also useful for skimming.

### Usability:

The Kindle is intuitive and easy to use. The interface is kept bare by default while reading. A light tap will bring up only a few options to perform further navigation. Tapping and holding one's finger on the screen starts the annotation tool.

**Collaboration:**

The “popular highlights” is the only form of collaboration. There is even an option to browse all these highlights.

**Academic support:**

None.

**Strengths:**

- popular highlights
- simple, intuitive interface that does all the user could want to do
- built in bookshop

**Weaknesses:**

- not conducive to consuming documents
- lacks ability to take notes on pages

## Microsoft Edge

Microsoft's Edge browser is Internet Explorer's successor. The primary feature of the browser is the ability to annotate any website.

### **Navigation:**

Edge works like any other web browser when it comes to navigation.

### **Annotation:**

An annotate button is located on the browser's toolbar. Pressing the button places the user into annotation mode, where they are free to markup the current page view. Text notes can be "stuck" to the page. Three different marker buttons allow free form writing directly on the page. This obviously would work best with a stylus, but also works with a mouse or trackpad.

### **Usability:**

Edge is as easy to use as any web browser. Everything looks familiar so users will be able to jump in without any trouble. Annotating with the free form tool works surprisingly well from a Macbook trackpad. It is not precise enough to draw fine lines or letters, but it is great for high lighting.

### **Collaboration:**

Annotated pages are saved to the user's Microsoft account. A share button is conveniently located on the toolbar. Unfortunately, it is not functional in the current "Project Spartan" beta release.

### **Academic support:**

Students get free access to Microsoft Software, so OneNote could potentially be used to further edit a saved page.

### **Strengths:**

- user friendly interface
- no need to download extra software
- annotation tools work well
- can annotate any website, not limited to PDFs
- should eventually have a large user base due to it shipping with Windows 10

### **Weaknesses:**

- share feature currently broken
- cannot draw shapes/lines on pages
- cannot save annotated pages directly as PDFs
- cannot save annotated pages to third party hosts (Drive, Dropbox)

## Notability

NOTE: I did not actually use Notability. The research is pieced together from videos, and online reviews.

Notability appears to have the richest set of features, even more than Evernote, that are geared toward students. It looks like a fantastic choice for both taking notes in the classroom, as well as annotating everything from PDFs, to PowerPoint presentations.

### Navigation:

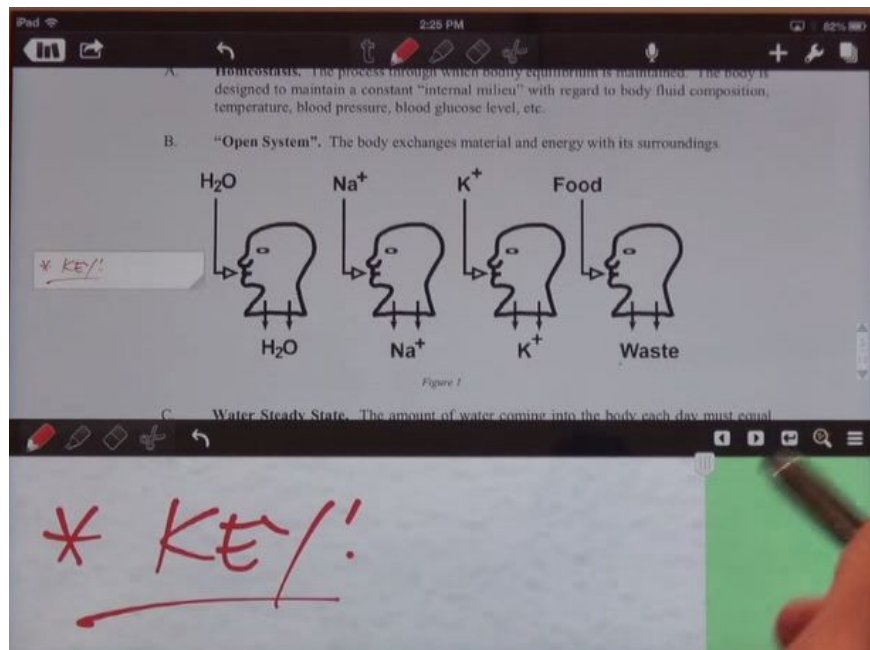
The app is quite powerful, so it might take a little while longer to become familiar with the navigation versus some of the competition. However, everything is clean, and intuitive. They have done a good job of not making it cluttered.

### Annotation:

Everything and the kitchen sink. Text, handwriting, audio notes, and web clips can be inserted into any note or used as annotation. The annotations can be edited in a number of ways.

Standout features here include a zoom box where the user can write by hand, which actually represents a smaller portion of the actual note.

The ability to annotate PowerPoint presentations is a big plus since many professors use slides for their lectures.



Adding web clips is a nice feature as well, with sites like MIT and Khan Academy providing excellent supplemental footage for anything who may have missed class.

### Usability:

The interface never gets in the way of the user's task. The iPad app looks very similar to the OSx app, so people can switch between the two with ease. They made it very easy to return to the previous screen, which is sometimes confusing with other apps (Kindle).

### Collaboration:

Notes can be shared via email with the click of a button. Private and public shared folders can be set up, but I do not believe that updates occur in real time.

**Academic support:**

There are no features specific to students or teachers, but the app is heavily marketed to that demographic.

**Strengths:**

- shared folders
- zoom view box for hand written notes
- search and insert web clips from within app
- Dropbox, Drive, Box, iCloud sync options
- search for highlighted words (only if typed)
- MS Word, Powerpoint support

**Weaknesses:**

- only available on Macs and iPads
- since it's geared for education, could be integrated with a calendar app to set deadlines
- shared folders and documents are not real time

## Papers

Papers is an academically inclined research workspace. Its primary use cases are to search for documents, organize them into collections, and annotate them. It consists of a desktop app, both Windows and Mac, iOS app, and a web app. A user's documents are kept in sync across devices and platforms. Furthermore, documents can be shared among members of a group by placing them in a shared collection.

### **Navigation:**

The navigation in Papers is simple and intuitive. The screen is divided into three columns. Annotations occur in the widest column which is in the middle. The annotation column is flanked to the left by the navigation window, and to the right where supplemental actions can be taken such as the downloading of on page media, or adding metadata to the documents.

### **Annotation:**

Annotations can only be made on PDF documents. Text can be highlighted in yellow, underlined, or have a strikethrough effect applied. Notes can also be made on PDF documents.

### **Usability:**

Papers is very easy to use. As soon as you boot up the software, you login with your Dropbox account. This allows for easy synchronization across many devices. Users can tag documents by keyword, colour, rating. This allows people to quickly search their local repository of papers. Annotating is simple since only a handful of features are supported. One handy feature of Papers is the ability to inject citations directly into a Microsoft Word document. This greatly speeds up what is normally a cumbersome task.

### **Collaboration:**

Collaboration is made possible from dropping documents into the "shared" collection. Right click on the documents you wish to share, then send the link provided to another person who wishes to view or annotate those documents. It's very straight forward.

### **Academic support:**

Users add documents to their Papers account manually by uploading them, or by search Papers build it repositories. Many of their repositories belong to academic sources such as ACM and CERN. PDF papers can then be downloaded directly to the user's account without having to open an external browser.

While Papers does not wade into the waters of document editing, it does integrate with MS Word to inject annotations from the user's collection.

### **Strengths:**

Papers does a great job of acting as the ultimate academic organizer. Gathering, consuming, and organizing for the purposes of research is made much easier with this software. These tasks can now be done with one piece of software instead of a few.

### **Weaknesses:**

- lack of annotation features (only text based markup, no freeform)

- collaborators must also have Papers
- can only synchronize using Dropbox (no Drive,iCloud,OneDrive)
- can only view one document at a time
- too heavy duty for everyday use / very specialized

# Appendix

## Commercial Analysis Template

### PRODUCT

#### SUMMARY

#### Analysis

Navigation:

Annotation:

Usability:

Collaboration:

Academic support:

Strengths:

- 

Weaknesses:

-

## Instructions

1. Read "[MyLiveNotes design principles](#)"
2. Read "[Thayer.pdf](#)" for the companion activities associated with reading

For each of commercial and research categories:

3. Search: find as many different tools and interfaces as you can.
4. Triage: determine which 5 are the most significantly advanced or directly competing with our work.
5. Analyze: how are they doing on navigation? annotation? usability? sharing? what are they doing very well (that we can learn from)? Where can we beat them? How do they support academic reading contexts?

Competitor types:

1. Commercial:
  - Papers (for Mac)
  - Microsoft Edge browser
  - OneNote, Instapaper
  - GoodReader
  - Adobe Acrobat Reader
  - Notability
  - Pages
  - MindNode
  - Evernote
  - iAnnotate
2. Research (find papers in "[competitor analysis papers](#)" subfolder):
  - Smarticle (<http://smarticle.walmink.com/>)
  - United Slates
  - XLibris
  - nStudy
  - LiquidText
  - Digital Reading Desk
  - Papiercraft