Assignment M4

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***Abstract*—**The Method (M) assignments for CS-6750 task the creation of thorough plans for performing user research and prototyping interfaces. One complete cycle through the design life cycle for a given task will be realized. The chosen task for these papers is the organization of files, such as structuring of folders and moving files around, within Google Drive. Google Drive is a free file storage cloud-based service developed by Google which allows for synchronization across devices and sharing of files with other users.

1 QUALITATIVE EVALUATION

I have selected the survey method for qualitative evaluation of the textual prototype defined in Assignment M3. The prototype can be found in Appendix 5.1: Textual prototype.

1.1 Evaluation plan layout

For this evaluation plan, I will conduct a survey using the PeerSurvey (peersurvey.cc.gatech.edu) tool. Therefore, my participants will be classmates, i.e. Georgia Tech OMSCS students enrolled in CS6750. I will recruit them via the tool and via the Ed Discussion platform. Should I need more participants, I will create an identical survey with Google Forms to send to friends and family.

1.2 Evaluation plan content

Before the actual survey questions, I will include a copy of the prototype at the top. The participants are expected to first read through the textual prototype and then answer the questions found in Figure 1.

1.3 Data inventory

In order to gather data about who the users are, I am again collecting data about the age and gender of the users. Additionally, I have included a question about their Google Drive experience in order to gauge their expertise level with the tool. This information is valuable for the requirements I defined, as I am most interested in designing an interface in which experienced users are better able

1. **Select your age group:**
   - ☐ Under 18
   - ☐ 18-29
   - ☐ 30-39
   - ☐ 40-49
   - ☐ 50-64
   - ☐ 65+
2. **Which gender do you identify with?**
   - ☐ Female
   - ☐ Male
   - ☐ Other
3. **Please rate your agreement level with the following statement: I feel very confident in my ability to manage files and folders in Google Drive.**

   Strongly disagree ☐—☐—☐—☐—☐ Strongly agree
4. **Are you familiar with the "Column"view in the Finder application on Mac OS?**
   - ☐ Yes, and I use it.
   - ☐ Yes, but I do not use it.
   - ☐ No, but I am familiar with the Mac OS.
   - ☐ No, and I am unfamiliar with the Mac OS.
5. **Please rate the following statement: I feel that having the "Column"view option, as described in the prototype, would give a clearer overview of files and folders in Google Drive.**

   Strongly disagree ☐—☐—☐—☐—☐ Strongly agree
6. **Please rate the following statement: I feel that having the "Column"view option in Google Drive would help me more easily navigate files and folders.**

   Strongly disagree ☐—☐—☐—☐—☐ Strongly agree
7. **Please rate the following statement: I feel that having the "Column"view option in Google Drive would help me more easily find files and folders.**

   Strongly disagree ☐—☐—☐—☐—☐ Strongly agree
8. **Please rate the following statement: I feel that having the "Column"view option, in Google Drive would help me more easily move files and folders.**

   Strongly disagree ☐—☐—☐—☐—☐ Strongly agree
9. **If you disagreed with any of the above statements, what were your reasons? (Optional)**

   _____

   _____
10. **Do you have any additional feedback on this prototype? (Optional)**

    _____

    _____

Figure 1—Survey

to efficiently organize their files. One concern I noted in Assignment M3 is that, as this feature mimics an existing interface, namely the Mac Finder "Column" view, that a significant number of users might not find the interface immediately intuitive. This survey evaluation will help me gauge to what extent some users might fall into this category. Additionally, I am hopeful that participants who do not consider this prototype valuable might leave feedback with their reasons which could feed into future iterations of the design life cycle.

2 EMPIRICAL EVALUATION

In this section, the card prototype will be evaluated empirically. The prototype can be found in Appendix 5.2: Card prototype.

2.1 Control and experimental conditions

In this evaluation, I would like to test how quickly participants can move a Google Doc into specified folder. The participants will be presented with the animal classification tree found in Figure 2.

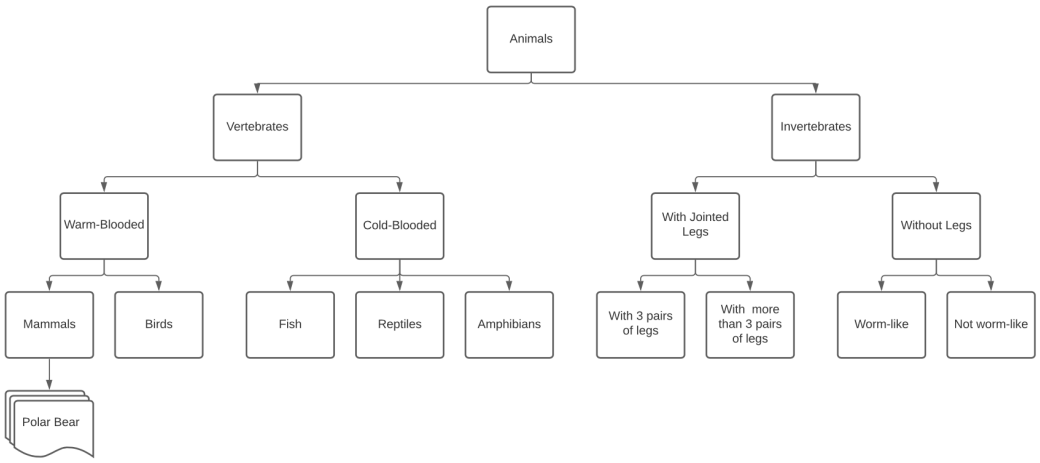

Figure 2—Animal classification tree

It will be explained to them that the folders in the Google Drive account they are accessing are set up according to this tree. However, the document with the name "Polar Bear" is currently misclassified somewhere in the tree. Information is not given to the participant where this document is located, i.e. the search function will need to be used. It will be timed how long it takes participants to find the "Polar Bear" document and move it to the current folder according to the classification tree.

For the control condition, the participants will be given the existing Google Drive interface. For the experimental condition, the participants will be presented with the interface as defined by the card prototype. As a reminder, this prototype allows for a simultaneous view of both search results and the current folder the user has manually navigated to.

2.2 Hypotheses

Hypothesis H_0 (null hypothesis): *The ability to have a simultaneous view of search results and the folder tree does not reduce the time to move a file to a different folder.*

Hypothesis H_1 (alternative hypothesis): *The ability to have a simultaneous view of search results and the folder tree reduces the time to move a file to a different folder.*

2.3 Experimental method

The experimental method will have a within-subjects design such that the participants will test both the control and experimental conditions. For this reason, the subjects will not need to be divided into control and experimental groups; however, they would be randomly assigned the order in which they are presented the conditions.

The participants will be described the task and given the reference figure. Subsequently, the task completion will be timed; this timing begins when they first are given access to the Google Drive account and the timing ends when the participant has moved the "Polar Bear" document to the "Mammals" folder.

The data generated will be task completion time, i.e. continuous ratio data. The alternative hypothesis will be accepted if it is statistically significant, i.e. if there is a less than five percent chance that the difference could have arisen by random chance.

2.4 Lurking variables

Of course, there are some downsides to within-subjects design which may lead to lurking variables, one of which is that the participant is given practice at the task which might make the second condition they test faster than it would have been had it been the first. Therefore, one way to reduce this effect is to randomly assign half of the participants to one order of conditions and the other half to the opposite order.

3 PREDICTIVE EVALUATION

In this section, the paper prototype will be evaluated with predictive evaluation. The prototype can be found in Appendix 5.3: Paper prototype. A GOMS model will be used to analyze how efficiently an experienced user can perform a given task.

3.1 Tasks

The task for this evaluation will be similar to the task which was used for the think-aloud protocol. There are two parts to this task:

1. Create and name the folders and files (blank Google documents) according to the hierarchy presented in Figure 3. Note that the rectangle icon represents a folder and the "multiple documents" icon represents a file.
2. Rearrange the folders and files according to Figure 4.

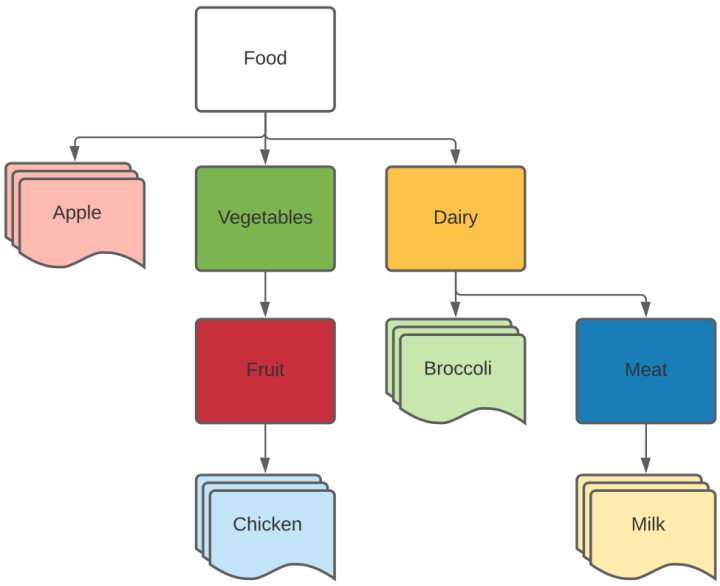

Figure 3—Task # 1

The user's goal will be to quickly create files and folders within the folder tree as well as easily move and reorganize folders. The operators available to them will be to create (name) and delete files and folders as well as move files and folders. The search functionality will not be an available operator for this evaluation. I will be evaluating a user accomplishing a single goal they know how to do in advance, as I more interested in experienced Google Drive users.

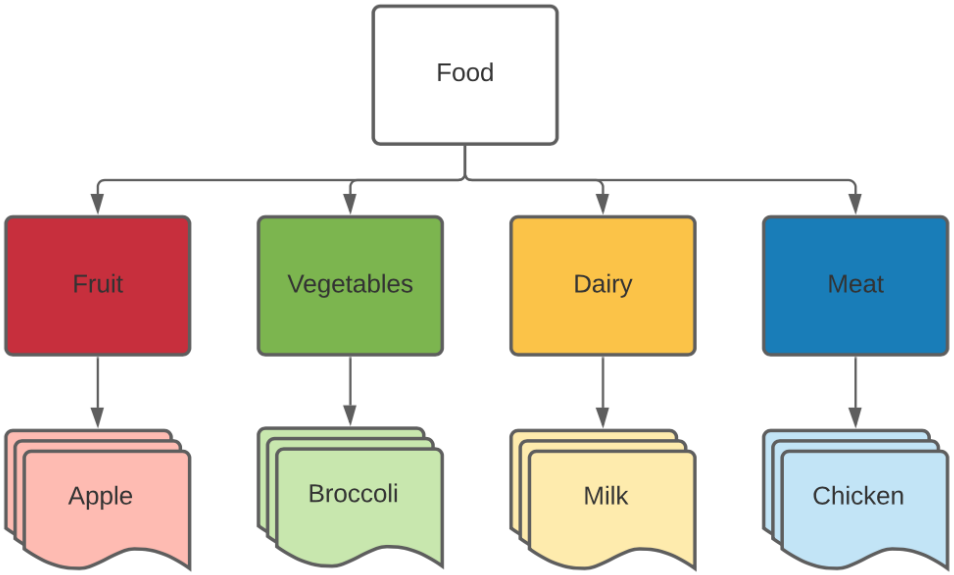

Figure 4—Task # 2

4 PREPARING TO EXECUTE

I will proceed with the qualitative and predictive evaluations for the next assignment. Although I find the empirical evaluation to be very interesting, I don't think it is feasible to develop a prototype which would be polished enough for this evaluation. Additionally, this evaluation would require a relatively high number of participants who would need to be able to have significant amount of time available because of the within-subjects design.

5 APPENDICES

5.1 Textual prototype

When using a hierarchy of files and folders in Google Drive, it is challenging for a user to simultaneously remain in a child folder and see the content of parent folders. This can be especially important when a user wants to organize their files and move certain files and folders to a different location in their drive.

In the current Google Drive interface, when a user is in a folder, they can only see the files and folders within that folder. There is a path displayed at the top of the interface; however, there are two significant disadvantages with this display. Firstly, it is not very prominent for the user. Secondly, this path is truncated

to only include "My Drive" (which is the root directory) and the parent and grandparent folders when the currently viewed folder is at least five levels deep in the folder tree.

Let's suppose we have a Google Drive user, Mary, who is a zoologist. She uses Google Drive professionally in her job at a zoo and creates documents for each type of animal in the zoo; therefore, she has a root directory named "Animals" which contains the folders "Vertebrates" and "Invertebrates". Within the "Vertebrates" folder, she has the folders "Warm-blooded" and "Cold-blooded". Within the "Warm-blooded" folder, she has the folders "Mammals" and "Birds". And within "Mammals", she has the documents, e.g., "Lions", "Tigers", and "Bears". At this folder in her file system, she is five levels away from the root directory, "Animals". Now, Mary is a skilled zoologist, but she occasionally misclassifies some animals. Unfortunately, in the current Google Drive interface, it is not possible for her to quickly see the contents of the parent, grandparent, etc., levels.

The alternative design of the Google Drive interface, proposes building in column panels to the interface much the way they exist in the Finder application on Macs. In this design, when the user navigates to child folders, the parent folders are still displayed, one column per level in the tree. It is possible to see all the contents for each level in the path when navigating deeper in the tree.

With this alternative design, Mary is offered a more comprehensive view of the detailed taxonomy of her animal classifications; she is no longer limited to only seeing the contents of the folder she is currently viewing. In this way, she can more easily understand where she is in the classification tree at any given time and can move files easily to other folders in the tree.

5.2 Card prototype

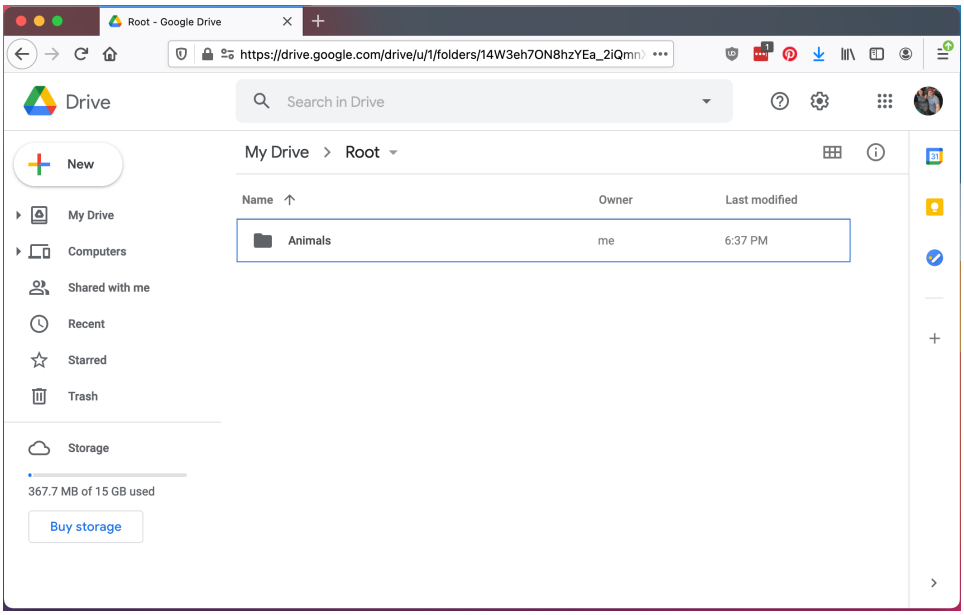

Figure 5—Card prototype - screen 1

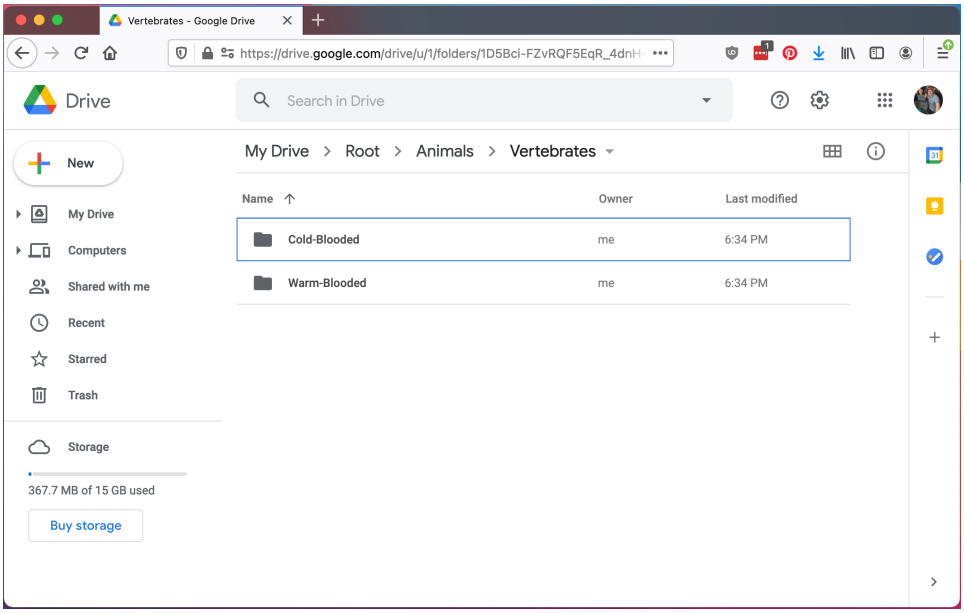

Figure 6—Card prototype - screen 2

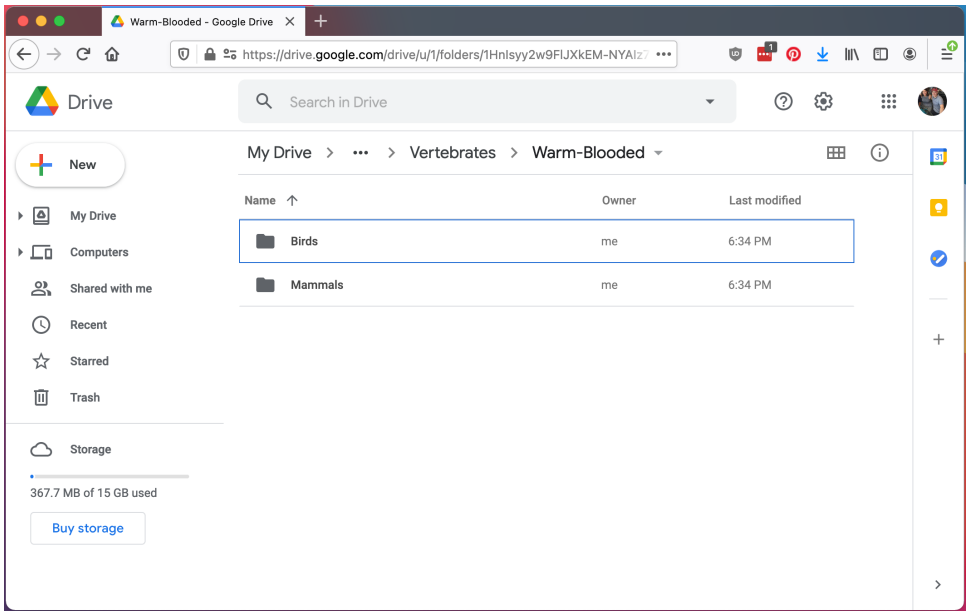

Figure 7—Card prototype - screen 3

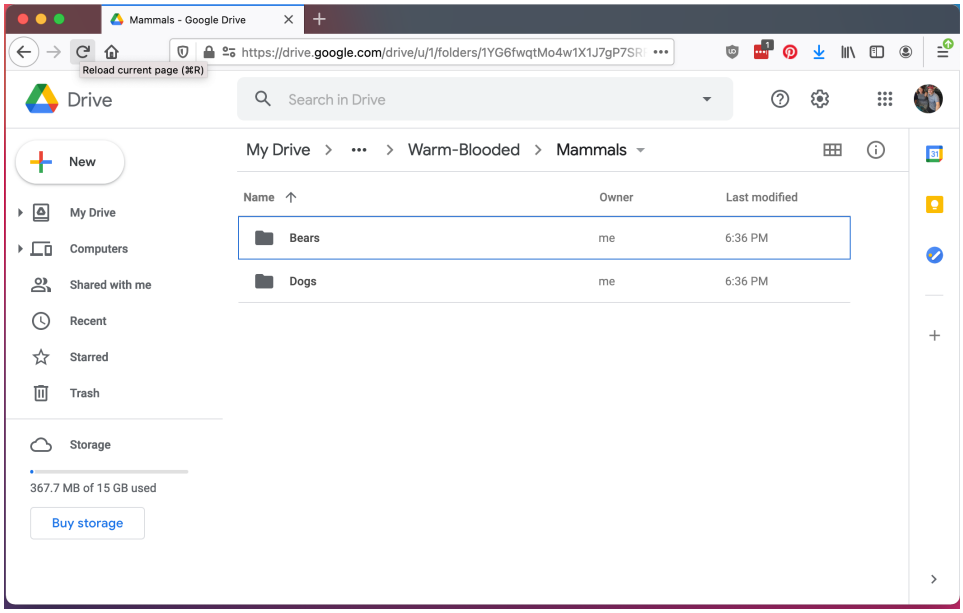

Figure 8—Card prototype - screen 4

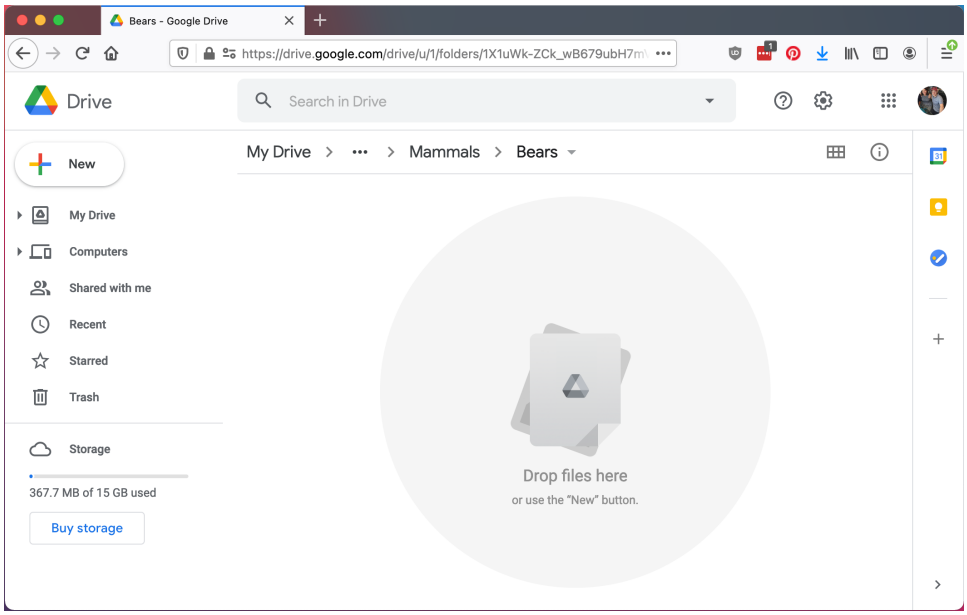

Figure 9—Card prototype - screen 5

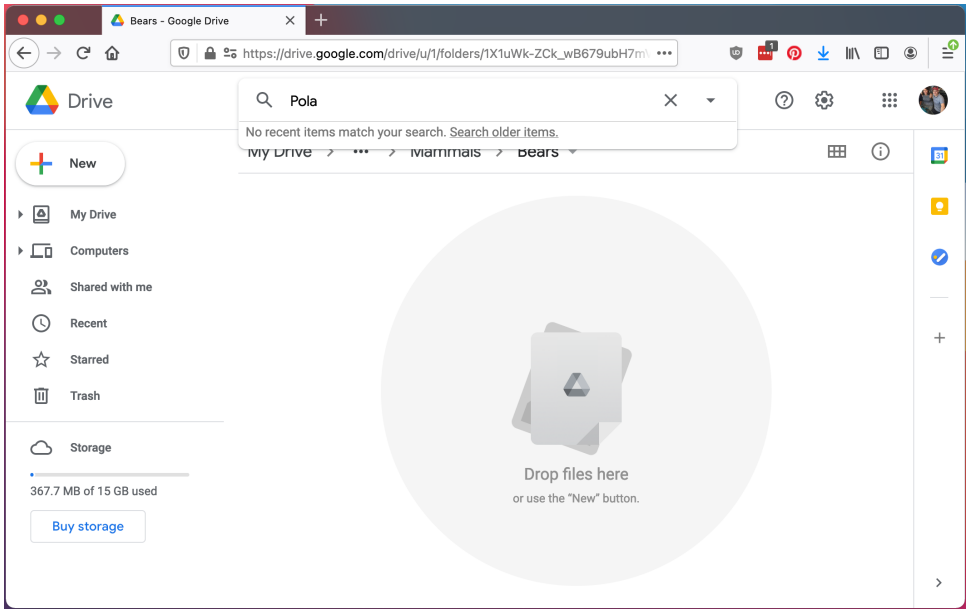

Figure 10—Card prototype - screen 6

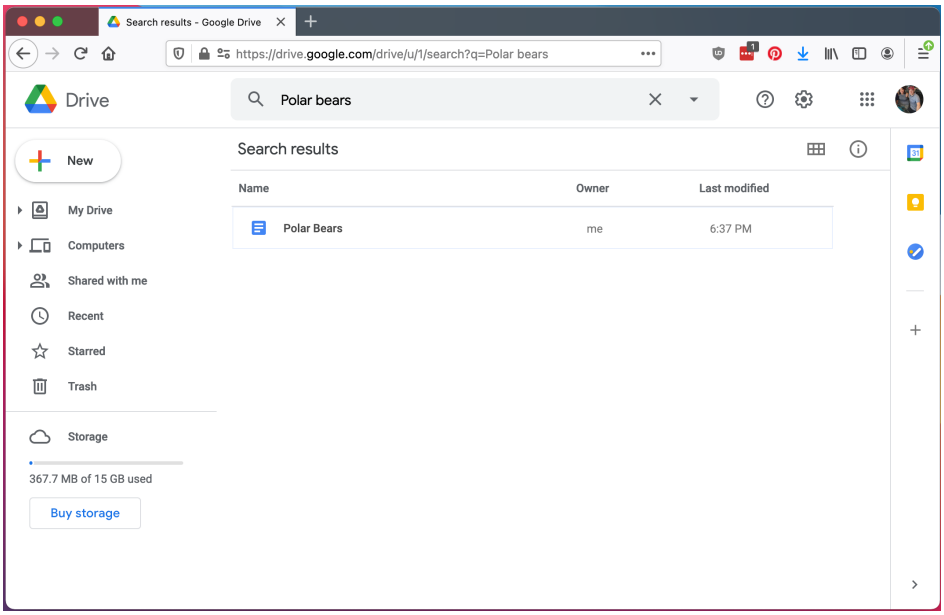

Figure 11—Card prototype - screen 7

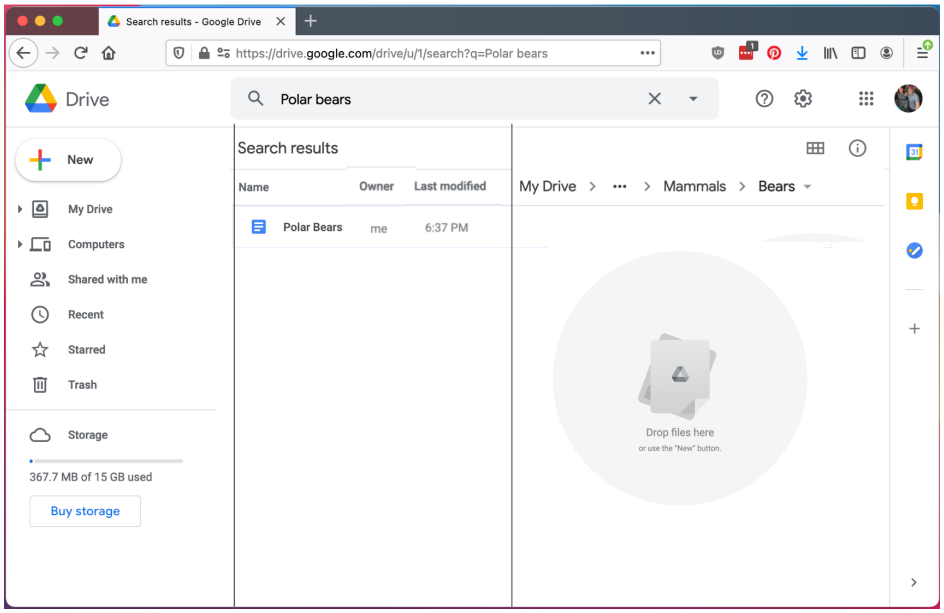

Figure 12—Card prototype - screen 8

5.3 Paper prototype

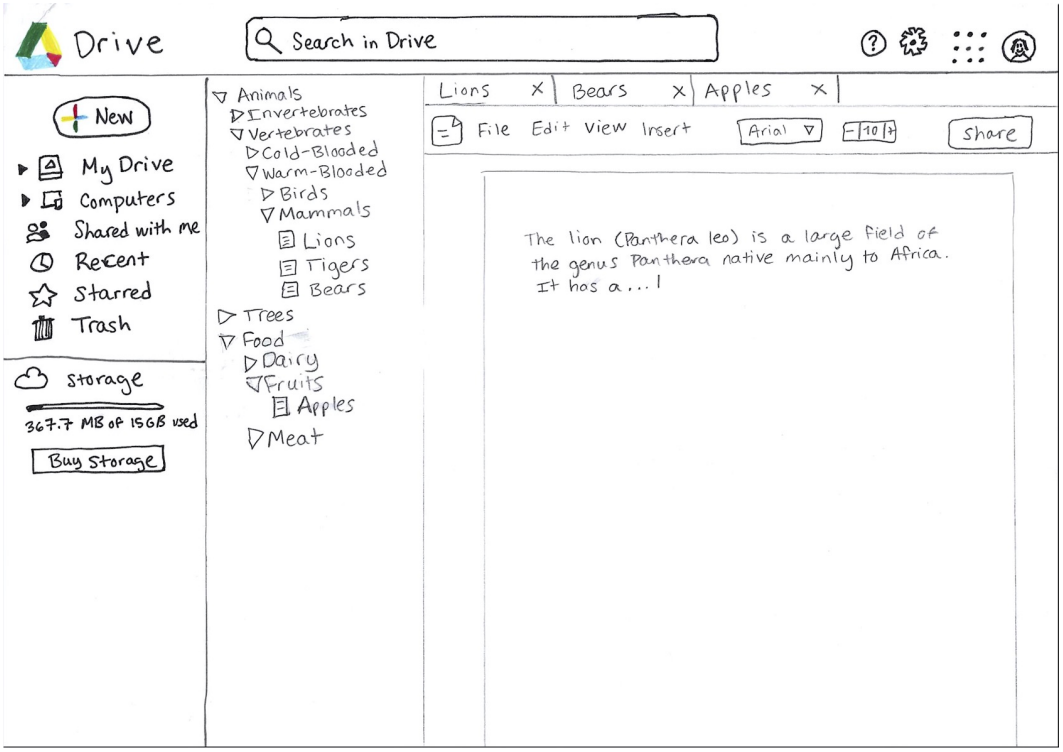

Figure 13—Paper prototype