

# **Group 6: Calico Final Report**

Informatics 132  
June 13, 2012  
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For convenience, this document along with the video recordings have been made publicly available, though they are unlisted and are only reachable via the provided links. These links will be removed on June 14, 2013 and the documents along with the recordings will no longer be reachable publicly. If you require a longer time frame than this or if you wish to obtain copies of any data, please contact Melvin Chien at [melvin.chien@gmail.com](mailto:melvin.chien@gmail.com).

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## **1. INTRODUCTION**

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Calico is a free hand design environment created to help support the early stages of software design. The tool is intended to be used on touch-based devices, though using it with a traditional mouse and keyboard is possible. Most software designers, when

tasked with a design problem, tend to sketch on a whiteboard or using pen and paper first, to work out an initial solution approach, either by themselves or in a small group. Calico is designed to support this process, with features that are designed to amplify good creative design practices. Calico's flexibility and fluidity allows for designers to be just as creative as they would be at a traditional whiteboard while its features support the software design process and users to collaboratively manipulate objects in various ways.

This user study was carried out by Saad Ahmad, Jola, Bojali, Melvin Chien, and Maxwell Taylor and was sponsored by Nicholas Mangano as a part of the Informatics 132 course at the University of California, Irvine, taught by Alfred Kobsa. The goal of this study was to determine the usability of Calico as a software design tool and to determine how well and to what extent Calico fulfills its intended purposes. In cases where it does not succeed at fulfilling its intended purposes, we have determined and provided recommendations for possible solutions or workarounds in this report

Our group and our project sponsor also developed several questions which we aimed to answer through the user study. Here are a few of them, in no particular order. How well does the user adapt to the tool's functionality? How often is the user negatively surprised by the tool's functionality? Do the tools and features function and behave in predictable manners? How often does the user struggle with the interface? Lastly, how well suited is Calico to the task of software design? We have aimed to answer these questions in this report.

## **2. HEURISTICS ANALYSIS**

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The first step of our study was to carry out a heuristic evaluation of Calico. This step was carried out somewhat informally and each our group members spent several hours familiarizing ourselves with Calico and playing around with its features. While doing this, we took notes on the issues and observations that we made. Through this process, we were able to determine some issues, prior to the actual user study. Due to the timing at which we carried out the heuristic evaluation and user study, a few issues that were promptly reported to our project sponsor were resolved before we carried out the user study.

The first and most obvious problem was that the Undo and Delete All buttons were far too close being right next to one another. The undo feature is frequently used as it is an effective way to fix a mistake. The delete feature however is not as frequently used and is a rather dangerous one if accidentally clicked. A user who had made a mistake could easily click the dangerous delete all button and cause even more

problems for themselves. Since this software is still under development, there were times at which once the canvas was cleared, it could not undo the clearing of the canvas. This sets users back immensely, though this only happened once.

The other issue that the heuristics uncovered was a metaphor issue. One of the core features of Calico is called scraps. Drawings and strokes on the canvas can be turned into scraps. As a scrap, these drawings can be manipulating, resized, rotated, duplicated, and more. As they were, they behaved like pieces of paper. At other times, the scraps also behaved like drawings on a whiteboard. This was intended as it provides more flexibility and features for the user. However, this mixed metaphors resulted in confusion between the two and sometimes, as seen later on, users had issues figuring out what they could do with the two different metaphors in the same application.

Lastly, a minor issue that was discovered is with the highlighter function. The highlighter feature allows the user to quickly point out something on the canvas. The user can draw a slightly transparent yellow stroke. After a few seconds, the stroke will disappear. This tool has a lot of uses and is a very convenient feature to have when users need to highlight an object. However, if a user uses the highlighter and then proceeds to use the Undo feature, the highlighter will then appear and be a permanent stroke. This is different from the expected result, which is for the Undo history to ignore the highlighter mark, and to actually undo the last action before the highlighter. At times, this seemed to be only a client side bug and not a server side bug, while at other times, the opposite was true.

### **3. USER STUDY PROCEDURE**

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A major part of our study was the actual design of the user study itself. Through many revisions we were able to finalize the user study. We also ran a pilot test of the user study we designed, which revealed many of the problems in our study study which we fixed. We fixed the scenarios, tweaked the tasks, added more options for users, and made the process simpler and clearer for the user, while still keeping it detailed enough for our analysis after.

For the user study, more than 16 people were contacted. Due to other involvements, we eventually ended up with 14 test users. With two people in each group, we had seven groups of test users. Prior to the user test, each test user completed a pre survey, [Appendix C-0](#). During their scheduled time, users arrived at the lab located at ICS2 110 on the UCI campus.

The entire process of the user study took approximately 40 minutes per group.

When users arrived, they were signed in. When both members of the group had arrived, the instructor began the briefing and moved onto the short, interactive tutorial of Calico. This took approximately 15 minutes. After, users were given 5 minutes to familiarize themselves with the system. To aid in this process, users were given a very broad task of designing a basic home page for any company. After this, the users were given the main scenario, [Appendix B](#), for the user study and were allotted 20 minutes to complete the task. Finally, users were asked to complete a post survey, [Appendix D-0](#), and were then given their reimbursement. During the user study, the instructor roughly followed a premade script, [Appendix A](#). The observer also recorded notes throughout the study which can be seen at [Appendix G](#).

## 4. USER STUDY ANALYSIS

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### 4-0. Overview

Calico is constantly under development. Early on in the user study process, there were more bugs due to changes made to Calico. We switched from a version of Calico which used a grid layout of the canvases to one which used a node system, called Intentional Interfaces. The nodes allowed for a more robust way of managing different canvases in Calico. However, it also introduced new bugs. As such, when we went to use the nodes for the first time with the first participants, the participants immediately began moving the nodes around. In certain situations, they deleted the center node, which caused the entire Calico program to crash, necessitating an explanation for this unexpected behavior. Situations like these caused a few problems in our testing, given that time was limited.

Across all our user studies, we have several factors that were not kept as controls. We could not get the same greeter, instructor, and observer for each test session, which may contribute to some variations in user behavior.

In a few groups, both users happened to be friends that knew each other quite well. This was not something we had planned before hand. When the users knew each other, they were much more comfortable with working with each other. This proved to be very helpful to the collaborative process and created for a friendly, more open, and less tense atmosphere. This ultimately led to better communication between the two people and to a more realistic software design process.

Lastly, as all of the users in each group were standing in the same room next to each other, none of the users put the highlighter feature to use. People often pointed out things to one another, but many forget that this existed or did not see the need for it. This was a side effect to the set up of our user study. We were limited to the room where the

smartboards were physically located and we wanted the users to be able to conveniently talk to each other and for our own group members to conveniently record and carry out the user study. Due to this all users just pointed to each other's boards or looked to one another's board to see what the object the object was being referenced was. We were however, able to cover this issue in our [Heuristics Analysis](#).

In the following sections, we will provide an in depth analysis of Groups 1 through 4. Due to the nature of our user study, many of the issues were apparent after just a few user studies and we feel it is unnecessary to provide a detailed analysis for each group. For overall issues, please refer to the [Recommendations](#) section.

#### **4-1. Detailed Analysis: Group 1**

In [Group 1](#), we saw User 1 struggle to get the boxes to expand to the right size. He spent the first few minutes trying to draw a box and make it the right kind of rectangle, only to be unable to figure out how to use the "make into a perfect box" button. Then he eventually figures it out after three-four tries, only to be frustrated as the button makes the entirely wrong kind of rectangle compared to what he was expecting. What follows is user 1 struggling repeatedly to align boxes and make them fit, as he wants to be organized but Calico is getting in the way.

User 2 on the other hand is busy trying to write a fancy headline. All goes well until he wants to type something in. His focus is broken and he spends a lot of time just figuring out how to use the keyboard. User 1 then has his focus broken as well and User 1 has to go and help User 2 with the keyboard. The physical placement of the Keyboard as well as the behavior of the box with which the text is in then annoys both users further. Another instance occurs in which User 1 makes an item and tries to move it, but touches the wrong part of it and makes a line instead, mildly annoying him.

User 1 also made several text boxes. Right after, User 2 attempted to move the top most box and failed to get a grip on it which confused him.. User 1 attempted to move it, but once again failed to do so properly and made a huge line instead. User 1 and 2 spoke about the undo button as they thought of using it, but had become afraid to do so since the last time they did that, they accidentally hit Delete All and wiped out the entire canvas and led to a crash.

At 5:10 of the recording, User 1 once again accidentally creates a line where he meant to move something. He mentions wanting to use "ctrl-z"--again, he cannot do this, because the keyboard command is not supported and the actual undo button has become too dangerous for him to attempt to use. At 5:20, one of the typical "movement lines" is visible on user 2's board. User 1 continues to have difficulty with making a circle, and User 2 tries to help him. This reveals an issue with the inability to make a perfectly circular scrap--there is no button for this. Once again at 6:41, the users spend even more

time trying to align a block shaped scrap. Then again at 7:05, User 1 creates a list and cannot make it a normal item afterwards. User 1 becomes nervous about touching anything based on how many buttons seem to do actions that cannot be undone. Users go to move the clothes in 6:02, but it seems rather inefficient as they have to move every piece individually. At 8:38 User 2 has trouble moving an object yet again.

The users are basically finished at 9:25. At this point we note that their attempt at a menu seems to have failed and would end up being split across categories instead. This is related to the issues involving the list and square boxes. Issues in Calico which continue to crop up across multiple tests of the system. At 10:51 User 1 concurs, saying that “The menu got screwed.” Users are forced to adapt to Calico rather than the other way around.

At 11:40, moving objects from the pallet is demonstrated, and the users struggle to copy items from the pallet. The users eventually figure that out, only to wonder how to erase objects from the pallet. The icons in the pallet take a while for them to figure out, backing up the heuristic analysis’ warning about the icons being hard to distinguish from one another.

The last observation relevant to this duo of users is that they want to make boxes with different colors in them... and have to improvise because Calico doesn’t allow boxes to be colored in natively. As mentioned earlier, both users had a personal relationship from before and their completed task was very creative and elegant. In order to decipher whether or not their personal relationship had anything to do with the quality of the work they produced, we would need to further observe this aspect with our other sets of users.

#### **4-2. Detailed Analysis: Group 2**

For [Group 2](#), both individuals didn’t know each other from before unlike our first set of users, and had met for the first time at the user study site. This would provide us with a little more insight as to whether not a personal relationship has anything to do with improved collaboration on a specific task. The users chose to design an ecommerce site that sold computer parts for their task.

Both of the users communicated that they wanted to model their website similar to that of Amazon. The basic layout of Amazon is as follows. Amazon includes a list of computer part options to shop from placed on the left hand side of the website. Located directly in line with the consumer’s sight would be the items that are most recommended, a search feature, a list of items to shop for which are new in stock, and off to the right hand side of the website is where the advertisements would be located. With this layout in mind, both of the users proceeded designing their website.



Both users easily showed that they were able to move around computer part objects that were provided from the palette. After dragging out all of the necessary computer part objects from the palette, User 2 proceeded to draw a large square which he made into a permanent square scrap using the “make it a perfect square” option. User 2 showed that he was able to easily resize and move the square scrap which eventually was used to provide a base for where the computer parts would be listed on the left hand side of the website interface. It’s interesting to note that the previous set of users also started their website design by drawing a large square or rectangle that would provide as a base for their website layout.

Instead of making use of text scraps, where titles and other text can be properly typed out and formatted, User 1 proceeded by hand writing the title of the website with the smart pen. User 1 was then observed coming over to User 2’s smart board when trying to point out a piece of functionality. This was interesting to see since in reality when Calico is used by users who are not directly next to each other, the highlighter tool would have been the equivalent way of pointing something out to other users working on the same canvas. So since the users were directly next to each other, the highlighter tool was not used when trying to point something out to the other user and vice versa.

User 2 displayed that he was able to also resize scraps and objects with ease. This shows that some of the icons, including the resize icon and the icon that allows users to move around scraps and objects are intuitive enough for these users to use and understand. User 1 was then observed making text scraps that included the names of the various computer parts. It’s interesting that user 1 didn’t make use of text scraps when creating the title of the webpage. User 2 then wanted to make these text scraps into a list, but was having a hard time figuring out how to do so. User 1 easily made use of the text scraps and created a list that contained all of the parts listed in an organized fashion.

After creating the computer parts list, user 1 wasn’t able to re-size the list into the size he wanted. After being frustrated by this, User 1 then proceeded by resizing the individual text scraps which then in turn made the overall size of the list larger. Both of the users were able to easily navigate to and from eraser mode, and made very much use of this mode to make quick fixes to their website design. User 2 then suggested to user 1 that it may be a better idea to erase the hand written title of the website and replace it with a more neat text scrap that included the name of the website. User 1 proceeded to do so, which displayed also that text scraps along with the eraser tool were intuitive pieces of functionality in Calico.

Suddenly while both users were working together, User 2’s smart board had lost sync with what User 1’s board was doing. This was realized when user 1 was creating various scraps and these scraps were not appearing on User 2’s smart board. This was a major bug that revealed itself during our user study, and forced both of the users to

work together on one single board. This would take away from observing collaboration, one of the main aspects being observed during our study as both users weren't able to be work concurrently on the website.

This event forced our customer Nick to come over and move all of the work that had been done by the users into the palette, so the two could then continue their work on one board in a new canvas with all of the scraps they had already made. Since scraps were made use of greatly during the design of this group's website interface, it was simple to put all of the pieces back together on a new canvas. Given that some time was taken away from the activity because of the bug, the two users continued where they left off in creating their website.

Since both users couldn't work on one board at the same time, the users were then observed switching off in completing the remainder of their task. User 2 proved that he was easily able to move the scraps and objects from the palette onto the new canvas. The users then proceeded to finish off their website design by creating a base square scrap for the "recommended for you" portion of the website and filled it with a few of the computer part objects. User 1 moved over to the keyboard to the right of the smart board and created the text scraps that included the name of the items, while User 2 adjusted the position of these items and their labels. The same methods were observed when creating the "new in stock", search bar, and advertisement portions to complete the remainder of the website.

Despite the fact that the bug had taken away concurrent work on individual smart boards, the two users still worked together and made the best of their situation. They each had their own individual role in completing their e-commerce website that sold computer parts.

The finished design of these two users was not as creative and admirable as the first set of users that we tested, not necessarily because both users didn't know or weren't comfortable enough with each other. Other factors could have also come into play such as these users may have been less creative than the first group, or they were interrupted by the occurrence of the bug that occurred. However, it was still observed that since the first group of users that we tested knew each other, it seemed that they had an easier time criticizing and including each of their own flavor to their finished design. Since these two users didn't know each other, it was observed that both users acquiesced to the desires of the other simply because they weren't familiar with each other, and may have not included what they really wanted in their finished design.

These users also made no indication that they wanted to make use of intentional interfaces, simply because they were too focused on one canvas and didn't plan on creating a new related canvas using intentional interfaces. These users were also interrupted with the appearance of the bug that completely put user 1's smart board out of

service and forced the two to work together on user 2's smart board.

### 4-3. Detailed Analysis: Group 3

[Group 3](#) was our first user study in which we had two female participants. Both of these users didn't know each other from before, however realized upon meeting at the user study site that they were both classmates in another class. This particular set of participants introduced the group to the "No show" aspect of conducting user studies, as there was a miscommunication between the group and user 1. Since the group had taken proactive measures prior to make sure all participant contact information was available, user 1 was informed and shortly thereafter arrived a little late to her scheduled user study time slot.

The user study continued as planned, and the participants were given a tutorial on the basic functionalities of Calico which provided them with the necessary knowledge that they needed in order to complete the user study task. The tutorial took approximately 10 minutes, and was concluded at 5:08. The participants decided to design a website that sold clothing, and then proceeded to navigate easily to the canvas that contained the clothing objects in the palette so they could begin working on their website.

The actual experiment started at 9:37, as User 2 was observed creating the base permanent square scrap in which the website would be located. In all of our user studies thus far, creating a permanent square scrap to contain the contents of the website is where all the groups seemed to have started with their designs. User 1 was observed making use of text scraps to create the title of the webpage at 10:28, as she used the enter button on the keyboard to quickly create the needed scraps. User 1 wanted to change the color of the text within the text scrap, and was a little frustrated knowing that she could do so.

Like the other users we have observed so far, our participants showed that they were able to easily move around, and resize scraps as necessary. This indicates the intuitiveness of the two icons, as they manifest their functionality through their icon picture very well. User 2 was observed using text scraps as well at 11:14 in order to create a list type of menu for the website. What was interesting to observe was that instead of using the enter hotkey on the keyboard to quickly create scraps; user 2 actually selected the text scrap option on the canvas every time before creating her text scraps.

At 12:34, user 2 was curious as to how to line up the text scraps that made up the list she had just created in a more organized fashion, and was told by group members that she wasn't able to be assisted during the actual user study. She proceeded to organize the list as best she could. User 1 showed at 13:04 that she was able to easily navigate away from eraser mode in order to continue working. Navigating away from eraser mode before actually continuing to work seemed to be kind of annoying to the

user, as it has been for our other participants as well.

In the task that the users chose to complete, the description mentioned that the users should include a manikin in their website design that would be used to see what clothes looked like worn by a manikin before purchase. The participants didn't seem to make any indication that they would be including the manikin in their design, possibly because they misunderstood the task prompt. The users continued to design their website as desired.

At 14:25, user 2 was observed easily dragging clothing scraps from the palette to include in the website. User 1 wanted to do the same, and was found at 14:41 having trouble with the button that toggled the appearance of the palette. After eventually noticing that she was toggling the palette on and off, user 1 proceeded to easily drag clothing scraps from the palette to add to the website.

At 16:48, both users re-read the prompt and realized that they needed to include a manican that would model the clothes somewhere in their website. User 2 then suggested creating a new related canvas that would represent when clothes have been "added to cart" would be a good option where a manican could be included. User 2 seemed to be leading the charge of the user study at this point, as user 1 agreed to do whatever was suggested by user 2 and seemed to be following her lead.

At 18:04, both users displayed that they were able to navigate themselves to the grid with ease and create a new canvas where they would continue to work on their website. Both users easily entered the new canvas thereafter and proceeded with their user task. At 18:45, user 2 showed that she was able place clothing scraps from the first canvas that was being worked on into the palette so that she would be able to use these scraps in the new canvas.

At 19:10, user 1 had trouble making the menu list of text scraps into one single permanent scrap that would embody the menu list. She was unable to do so, and instead she moved the individual text scraps that made up the menu list into the palette individually so she could use them on another canvas. At 20:36, user 1 showed that she was able to rotate scraps clockwise and counter-clockwise with ease, another indication of an intuitive icon. Since both of the participants were females, it seemed that they tended to be a little picky when it came to overall organization and neatness of their finished product.

Around 24:40, both users tried to make more square scraps to add their finishing touches to their website design, but found that the creating scraps wasn't working properly. They proceeded to continue with their website design in frustration. Finally at 26:30, the participants were observed creating one more new canvas to complete their website design.

These set of participants also didn't make use of intentional interfaces even though they were navigating to the grid more than any other group we have seen do so far. Overall, the two worked very well together despite not knowing each other very well. However, user 2 seemed to take a little more charge during the experience. Their finished product was a nicely designed website for selling clothes.

#### **4-4. Detailed Analysis: Group 4**

For [Group 4](#), we once again had two participants who knew each other previously. In fact, these two users had taken classes together and were even lab partners during the ICS 20 series. It would be interesting to see if their prior relationship would had to their dynamic during the experiment.

Users 1 and 2 do not use the scrap system as much, preferring to draw everything freehand. Once they do feel like they need a box, they summon a square scrap. User 1 has trouble reacting the top of the board and figuring out how to use the icons and gets stuck in eraser mode at 2:20. User 2 has no problem moving around the box scrap she has made but then has trouble with resizing the scrap.

User 1 is puzzled by the behavior of Calico at 3:06. She takes a while to move the icon in place. Once again, the user seems to want to align the scrap to a grid, but has no means to do so. She remains in eraser mode much of the time. User 2 on the other hand has no real problem using the scraps, though yet again she seems to want to align the square scrap. Around 4:42 both users use the keyboard, showing the value of multiple keyboards to do repetitive tasks and split them between users. At 5:41, user 2 asks about wanting to be able to change the font color inside the typed out text boxes.

The "Eraser Mode" phenomenon is explained in 6:06--User 1 often does not realize if she is in Eraser mode or not. At 7:50, potential weaknesses are seen in the prompt. User 2 seems confused as to what to do at first glance of the prompt. It takes a while for the users to decide, almost 3-4 minutes in fact. It takes until 13:27 for User 1 to finally touch the board again.

At 13:46, the lack of transparency in an image causes a problem and prevents overlapping images properly. 14:27 shows that the pens for the whiteboards double as useful gestures for inter-user communication. User 1 has to look to the right manually to know what user 2 is typing--perhaps a good idea to make Calico give users information on what the other user is typing up for a scrap.

The distance between the keyboard and whiteboard slows down User 12 during 16:34. At the same time User 1 is stuck waiting and spends their time moving things, then deleting errant marks from the board. 17:36 shows user 2 pushing the buttons, then,

due to lack of feedback, having to double-check that she selected them in the first place. At 18:26, user 2 has issues trying to drag items from the pallet, much like the other groups.

By 19:09, it becomes clear that the two users did not really understand the prompt. They have made a loose collection of images without any real website connection. The prompt may have been too vague for this step, as the two users made a very website-like image in the first part. In 20:03 a lack of transparency on the clothes thwarts attempts to make a demonstration of the "clothes preview" function, at least partially.

User 1 begins to have issues making a box around 20:20; she wants something but doesn't seem to be able to make it using what Calico currently has. Meanwhile, User 2 spends her time erasing stray marks made from failed attempts to get items from the pallet. At 21:36, User 2 demonstrates that the pallet is blocking part of the whiteboard and is rather inconveniently placed, with no way to really move it anywhere else.

At 24:50, the users make use of a new canvas... and that is basically all they do. No real use of the intentional interfaces happens. Instead, they focus on the pallet and their new website design. At 26:18, User 2 once again winds up drawing around the pallet area.

This group showed that Calico's pallet area often gets in the way, that users still want to align boxes to some sort of grid, and that users want more control over fonts. Transparency in images would be important for any function that relies on overlaying of images, and the eraser mode appears to be incapable of giving enough feedback to the user as it currently is. The icons in general do not seem to give feedback beyond being highlighted when they are clicked, leaving users confused as to whether they selected an icon at all to begin with.

## **5. RECOMMENDATIONS**

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### **5-1. Icons**

From this study, we have been able to identify several key problems with Calico. In this section, we will go over those problems and provide our recommendations for each. These recommendations are our own educated opinions and may not be the final or best solution.

The first and most widespread problems that was noticed during the study is that many of the buttons have hard to understand icons. The icons are all fairly small and

uniform in appearance, which was problematic. An example of this are the undo and redo icons, as seen in [Appendix E-0](#). As was mentioned in the [Heuristics Analysis](#) and in the [User Study Analysis](#), the Undo, Redo, and Delete All buttons are poorly labeled and their proximity makes using one of them dangerous. In the fast and inaccurate touch environment, it is too easy to accidentally push the Delete All button. Thus this area is an important one to be improved with more emphasis on the icons and separation of the features. As we carried out the test on the smartboards and with the actual undo and redo functions occasionally being unreliable and the clear function being next to the undo button, this made that area of the board very dangerous to touch.

When Calico is used on a tablet or on a projector, these icons are difficult to distinguish from one another. On a tablet, the icons become too small, while the projected display on the smartboard was too blurry. Many users had troubles identifying which icons would perform what function. As part of our user study, test users were given 15 minutes to learn the system, which consisted of a 10 minute guided tutorial and a 5 minute guided playtime. Despite this, it was a frequent problem that users were not able to easily recognize the icons. Users spent a lot of time fiddling with these functions to get the result that they wanted.

To resolve these issues, we believe that Calico should get an improved set of icons that are more universally recognizable. By its nature, many of Calico's functions are also similarly available in programs such as Paint, Gimp, and Adobe Photoshop, which are all well known and widely accepted. While Calico certainly does have its own unique features, it is best to have as small of a learning curve for users as possible, to ensure that users get the best experience.

## **5-2. Scraps**

Another issue that we noticed from our analysis is that Calico's scraps take a while to get used to. Scraps are one of the defining features of Calico, and this was to be expected. At times, users wanted something which snapped to a grid and which could be resized both proportionally and unproportionally as well. They expected the scrap to move like a real piece of paper would, simply by touching it and dragging it. Calico's temporary scraps also caused further confusion, as this is a unique feature to Calico. When Calico did not behave in the expected way, it surprised and confused them, causing them to lose focus, and thereby hindering their productivity.

To reasonably reduce this problem, we feel that Calico should have an interactive tutorial or help system built in. Currently, there are manuals and posters to aid users with Calico, however these are external to the system and successful software often have very simple, intuitive, clear, and concise tutorials built into them, usually automatically displaying on first launch. The addition of this should greatly streamline the learning curve for users who are not familiar with Calico.

### 5-3. Intentional Interfaces

None of the users actually used the intentional interface for what it was intended. It will have to become more reliable before users can safely test it. All of the users simply chose an empty canvas to work in, without any concern for the links or the nodes. The Intentional Interfaces concept was hard for users to get a grasp on. Users had the perception that canvases are separate from each other. This is clearly true and this is also the issue that the node graph attempts to alleviate. This may also be due to the fact with the perception of the website the users had, as it did not have a clear flow of processes.

Intentional interfaces should become safer to use and easier to make. It should be possible to link to different canvases from parts of one canvas, like hyperlinks, although the client has hinted that this has been tried before. It might bear reconsideration given how little the users actually bothered to use the current interfaces.

Intentional interfaces may need to be made more “integral” to the experience. Currently, users make one canvas and feel it is completely isolated from all the others. While a “peek” function may not be the most useful, it is the opinion of the authors that the Intentional interface is somewhat difficult to visualize for users. An alternative to this is perhaps a “picture in picture” mode, which would also achieve a similar effect. Users could view multiple canvases and click between them in this fashion. This way they could see connected canvases if they wanted to, or turn it off if they wished to concentrate on one canvas.

In general, it appears the current Intentional Interface is under construction and should be focused on in any future user tests, so as to get more data on what would best suit users’ tendencies. Otherwise it is liable to remain underutilized or even ignored by the average user.

## 6. CONCLUSION

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Calico is a highly innovative tool that allows for software designers to easily collaborate on a project or multiple projects. Calico enhances the concept of a traditional whiteboard and enables users to manipulate their sketches and drawings along with many other features. The tool itself has been under development for a couple years and is still constantly being improved upon. Through our user studies and the post survey results, [Appendix D-8](#), it is clear that Calico successfully fulfills its original intended purpose of aiding software designers in their development stages. With the further



improvements suggested in this report, additional features, and improved stability, we feel that Calico will become much more popular among software designers globally.

We would like to thank Alex Kobsa for providing us with this opportunity. We have learned a lot through the course of this project and we have thoroughly enjoyed the experience. We would also like to thank Nicholas Mangano for this opportunity as well and for his constant cooperation and involvement throughout. We appreciate the time he spent, his dedication, and the constant feedback that was given to us concerning this project and user studies in general. We wish you the best of luck in the future and we are hopeful to start hearing about Calico everywhere!

*Thank you Alex Kobsa and Nicholas Mangano!*

*Saad Ahmad*

*Jola Bojali*

*Melvin Chien*

*Maxwell Taylor*

## **APPENDIX A: INSTRUCTOR SCRIPT**

This is the script that the instructor followed for the user studies.

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### **Informatics 132 Calico User Study**

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

#### **Script - Briefing**

Welcome and thank you for participating in the Calico user study. Today we will be asking you to perform a design activity using Calico, a tool to help freeform software design at the whiteboards. The goal of this experiment is to test Calico's usability.

During this study, we will be recording audio and video data while you perform the experiment and any data on our users will be kept strictly confidential and will not be publicly available. Remember that the test only concerns how Calico performs as a tool and does not concern on your personal performance.

The entire activity will take no longer than up to 40 minutes. After the activity we will ask you to fill out a survey before giving you your compensation. During this test, we encourage you to talk out loud. Say what you are thinking and doing and also communicate and coordinate with your partner.

#### **Script - Tutorial**

We will now begin with a tutorial of Calico. After the tutorial, you will have about 5 minutes to design a homepage for a company. Use this time to practice talking out loud, and familiarizing yourself with Calico. Please ask us if you have any questions.

#### **Script - Scenario**

We will now move onto the main activity. Please read over the handout and choose a company with your partner.

During the main activity, we will not be able to answer any questions other than those concerning the capability of the system. Please remember to think out loud as that will help us evaluate Calico.

#### **Script - Conclusion**

1 Minute Warning: Please finish up any designs you have going.

Thank you for participating. We would now like to ask you to please take some time to fill out this post testing survey. Once you have completed that, you will get movie ticket and you will be free to leave. Thank you for participating in our Calico user study. We appreciate your time and effort. If you have any last questions, please let us know.

## APPENDIX B: SCENARIO AND TASK

This is the scenario and tasks for the participants of the user study.

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### Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

#### Scenario

You are a web developer for Inotech Inc., the leading e-commerce website developer. The CEO was highly impressed with your redesign of the homepage and has asked that your team personally design the catalog system for browsing inventory items. She has multiple clients who want websites, in a variety of categories and has asked that your team choose one. She has listed the various businesses below along with the industry and a couple general features the clients would like to have on their website.

- Green Life — Gardening
  - Planting schedules, plant environments, model a garden
- AutoMech — Automotive
  - Car parts, model parts on a car
- Style Now — Clothing
  - Outfits, sizes, colors, model clothes on a mannequin
- Decore and Life — Home Furniture
  - Furniture, decorations, model furniture in a room
- Master North — Computers
  - Cases, computer parts, model parts in a desktop
- TravelEx — Travel
  - Vacation destinations, travel methods, model trip on a map
- Titanium Steel — Amusement Parks
  - Rollercoaster parts, tracks, cars, model parts as a completed rollercoaster

The CEO has also listed a few tips for your team to keep in mind when creating the website.

- How can the customer visualize their experience with the product and how will they interact with that visualization?
- How does the customer navigate between the items?
- How can the visitor compare two or more items?

Based on your choice above, your task for the next 20 minutes is to design a creative web page for browsing the client's inventory. A set of images have been loaded into the palette to help you create mockups of the catalog you have chosen.

## APPENDIX C: PRE USER STUDY SURVEYS

These are the surveys that were given to participants before the user study. [Back to Top](#)

### Appendix C-0: Template

# Calico User Study - Pre Survey

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

\* Required

**Name \***

*i.e. Peter Anteater*

**Major \***

*i.e. Computer Science*

**Class Level \***

- Freshman  
 Sophomore  
 Junior  
 Senior

**How many years of software development experience do you have? \***

*i.e. 4 years*

**Have you ever taken a course in or related to software engineering? \***

- Yes  
 No

**If yes, what course did you take?**

*i.e. ICS 52 - Intro to Software Engineering*

**If no, do you plan to take any in the future?**

**When developing software, do you usually draw or use diagrams to assist with the overall process? \***

## Appendix C-1: Group 1

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/21/2012 14:05:08	Syed Zaidi	ICS	Junior	2	No	Intro to programming - (C++ and Java)		I draw and use diagrams.
5/21/2012 15:07:18	Faraz Ahmad	Computer Science	Junior	2	Yes	ICS 21		No

## Appendix C-2: Group 2

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/21/2012 15:09:29	Ahmed Dada	Business Economics	Senior	0	Yes	INF 43 - intro to software engineering		Have not developed before, but have taken ics 21 and 22. When I took those courses, I did draw diagrams to help aid with coding

## Appendix C-3: Group 3

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/22/2012 8:50:41	Sindhoora Kuchibhotla	BIM	Junior	0-1	Yes	INF 43		Yes
5/22/2012 8:51:52	Shama Bawany	Computer Science	Senior	4	Yes	Ics 52		Yes

## Appendix C-4: Group 4

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/21/2012 9:00:11	Swati Bhonsle	Computer Science	Junior	1	Yes	ICS 52		ALL THE TIME!
5/22/2012 15:39:36	Nicholas Chihaiha	Computer Science	Junior	2	No		ICS 52	Yes

## Appendix C-5: Group 5

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/21/2012 15:59:39	Angeline Gray	CS	Senior	4	Yes	ICS 52		Don't usually draw them, if somebody else in my group draws some then I will use them.
5/22/2012 18:42:37	Francesca Amparo	Business Information Management	Junior	1 year	Yes	INFORMATICS 43		Yes

## Appendix C-6: Group 6

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/24/2012 13:40:04	Kelly Yin	Computer Science	Junior	less than 1 year	Yes	I am currently taking ICS 52.		I use diagrams.
5/25/2012 12:18:25	Angela Li	Computer Game Science	Freshman	0	No		Yes	Although I have no experience in developing software, I believe that I would use diagrams when I learn how to develop software.

## Appendix C-7: Group 7

Timestamp	Name	Major	Class Level	How many years of software development experience do you have?	Have you ever taken a course in or related to software engineering?	If yes, what course did you take?	If no, do you plan to take any in the future?	When developing software, do you usually draw or use diagrams to assist with the overall process?
5/21/2012 8:28:51	Patricia Chin	Computer science	Senior	3	Yes	ICS 52- Intro to Software Engineering		Yup. ;)
5/21/2012 16:00:54	Dinorah Carrion Rodriguez	Computer Science and Engineering	Freshman	0	No		Yes	When coding, I do draw

## APPENDIX D: POST USER STUDY SURVEYS

These are the surveys that were given to participants after the user study. [Back to Top](#)

### Appendix D-0: Template

#### Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

##### Post Survey

Name:

Major:

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	2
Very Intrusive	Somewhat Intrusive	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

Would you recommended Calico to a friend for a future project?

-2	-1	0	1	2
Definitely Not	Probably Not	Neutral	Probably Would	Definitely Would

Do you have any other comments or suggestions on Calico:

Appendix D-1: Group 1

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: Syed Zaidi

Major: ICS

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How helpful were Intentional Interfaces in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How helpful was Calico in organizing work between you and your partner?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How intrusive or distracting were Calico's features to the design experience?

-2 Not Intrusive	-1	0 Not Intrusive	1	2 Very Intuitive
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How helpful was Calico overall in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

Would you recommended Calico to a friend for a future project?

-2 Definitely Not	-1 Probably Not	0 Neutral	1 Probably Would	2 Definitely Would
----------------------	--------------------	--------------	---------------------	-----------------------

Do you have any other comments or suggestions on Calico:

Icons need names because they were hard to differentiate.

Icons should be bigger.

Icons need to look different.

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: FARAZ AHMAD

Major: COMPUTER SCIENCE

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	--------------------------

How helpful were Intentional Interfaces in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	--------------------------

How helpful was Calico in organizing work between you and your partner?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	--------------------------

How intrusive or distracting were Calico's features to the design experience?

<u>-2</u> Not Intrusive	-1	0 Not Intrusive	1	2 Very Intuitive
----------------------------	----	--------------------	---	---------------------

How helpful was Calico overall in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

Would you recommended Calico to a friend for a future project?

-2 Definitely Not	-1 Probably Not	0 Neutral	1 Probably Would	2 Definitely Would
----------------------	--------------------	--------------	---------------------	-----------------------

Do you have any other comments or suggestions on Calico:

Pointer tool

names for icons

Combine paint brush into one  
-choose color

icons need to look different from  
each other

Appendix D-2: Group 2

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: *Ahmed Dadu*

Major: *Business Economics / Informatics*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	--------------------------

How helpful were Intentional Interfaces in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	<u>1</u> Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	------------------------------	-------------------

How helpful was Calico in organizing work between you and your partner?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	--------------------------

How intrusive or distracting were Calico's features to the design experience?

-2 Not Intrusive <i>Intuitive</i>	-1	0 Not Intrusive <i>Intuitive</i>	<u>1</u>	2 Very Intuitive
---	----	--	----------	---------------------

*Intuitive*

How helpful was Calico overall in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
-------------------------	-----------------------------	---------------------------------------	--------------------------	----------------------

Would you recommended Calico to a friend for a future project?

-2 Definitely Not	-1 Probably Not	0 Neutral	1 Probably Would	2 Definitely Would
----------------------	--------------------	--------------	---------------------	-----------------------

Do you have any other comments or suggestions on Calico:

Undo and redo were not very helpful

Scraps can only be edited sometimes  
that we created

Pen sizes were not what they seemed

Eraser not as specific as I would like

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: Michael Vorebyov

Major: CS

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How helpful were Intentional Interfaces in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How helpful was Calico in organizing work between you and your partner?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How intrusive or distracting were Calico's features to the design experience?

-2 Not Intrusive Intuitive	-1	0 Not Intrusive Intuitive	1	2 Very Intuitive
----------------------------------	----	---------------------------------	---	---------------------

Intuitive

How helpful was Calico overall in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
-------------------------	-----------------------------	---------------------------------------	--------------------------	----------------------

Would you recommended Calico to a friend for a future project?

-2 Definitely Not	-1 Probably Not	0 Neutral	1 Probably Would	2 Definitely Would
----------------------	--------------------	--------------	---------------------	-----------------------

Do you have any other comments or suggestions on Calico:

Cannot make boxes skinnier or fatter can only  
Scale equally in all direction, gets obstructive.

Appendix D-3: Group 3

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: *Shama Bawany*

Major: *Computer Science*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	<u>0</u>	1	2
Very Intrusive	Somewhat Intrusive	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

Would you recommended Calico to a friend for a future project?



-2  
Definitely Not

-1  
Probably Not

0  
Neutral

1  
Probably Would

2  
Definitely Would

Do you have any other comments or suggestions on Calico:

Board is a little sensitive  
- Really good for collaborating

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: Sindhuora Kuchibhotla

Major: BIM

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	<u>Neither Helpful nor Unhelpful</u>	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	<u>Very Helpful</u>

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	<u>Somewhat Helpful</u>	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	2
Very Intrusive	Somewhat Intrusive	<u>Not Intrusive</u>	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	<u>Very Helpful</u>

Would you recommended Calico to a friend for a future project?

Yes

-2  
Definitely Not

-1  
Probably Not

0  
Neutral

1  
Probably Would

2  
Definitely Would

Do you have any other comments or suggestions on Calico:

It is easier to see what your colleague is working on, but it's hard to know whether or not you're in their way. Maybe it would have been easier <sup>for</sup> each of us to ~~to~~ work on individual pages & collaborate.

Appendix D-4: Group 4

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: *Nicholas Chitwira*

Major: *Computer Science*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	2
Very Intrusive	Somewhat Intrusive	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

Would you recommended Calico to a friend for a future project?

-2  
Definitely Not

-1  
Probably Not

0  
Neutral

1  
Probably Would

2  
Definitely Would

Do you have any other comments or suggestions on Calico:

I think Calico need additional features to help draw layouts with more presion such as straight lines. ~~More~~ More features that are resembled in websites such as text input fields, being able to resize ~~the~~ squares width and length isolated. The icons are not intuitive enough. Some look too similar and make it hard to distinguish when using for the first time.

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: Swati Bhonsle

Major: Computer Science

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	<u>Somewhat Helpful</u>	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	<u>Somewhat Unhelpful</u>	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	<u>Neither Helpful nor Unhelpful</u>	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	2
Very Intrusive	<u>Somewhat Intrusive</u>	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	<u>Somewhat Unhelpful</u>	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

Would you recommend Calico to a friend for a future project?

-2  
Definitely Not

-1  
Probably Not

0  
Neutral

1  
Probably Would

2  
Definitely Would

Do you have any other comments or suggestions on Calico:

- need to make UI more intuitive
- how is this different from a tablet?
- why is worse: drawing standing up (not usually how artists draw)
- if goal was collaboration then go for something more like Google Docs where drawing is intuitive, EASY & other person can see.
- have a sketch rough feature where pairs can BRAINSTORM before immediately drawing.

Appendix D-5: Group 5

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: *Francesco Amparo*

Major: *BIM*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	<u>1</u>	2
Very Intrusive	Somewhat Intrusive	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful



Would you recommended Calico to a friend for a future project?

-2  
Definitely Not

-1  
Probably Not

0  
Neutral

1  
Probably Would

2  
Definitely Would

Do you have any other comments or suggestions on Calico:

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: Angeline Phan Eray

Major: Computer Science

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	2
Very Intrusive	Somewhat Intrusive	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

Would you recommended Calico to a friend for a future project?

-2  
Definitely Not

-1  
Probably Not

0  
Neutral

1  
Probably Would

2  
Definitely Would

Do you have any other comments or suggestions on Calico:

If there was a way to select things without accidentally drawing all over that would be nice.

## Appendix D-6: Group 6

### Post Survey

Name: *Angela Li*

Major: *Computer Game Science*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	<u>Somewhat Helpful</u>	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	<u>Somewhat Helpful</u>	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	<u>Very Helpful</u>

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	2
Very Intrusive	Somewhat Intrusive	<u>Not Intrusive</u>	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	<u>Somewhat Helpful</u>	Very Helpful

Would you recommended Calico to a friend for a future project?

-2	-1	0	1	2
Definitely Not	Probably Not	Neutral	<u>Probably Would</u>	Definitely Would

Do you have any other comments or suggestions on Calico:

This is helpful when you want to easily move around objects and experiment. It is very easy to delete things and redo things without intruding on the rest of the design and ~~the~~<sup>my</sup> partner's work.

Some ~~the~~ features that would be nice are (1) having the option of resizing a box in one direction instead of two directions. (2) ~~when~~ selecting, you can adjust the shapes outline thickness and color. It would also be nice if ~~the~~ lines <sub>↓</sub> can also be selected and moved.  
, not only shapes,

**Post Survey**

Name: *Kelle Yin*

Major: *Computer Science*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2	-1	0	<u>1</u>	2
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful were Intentional Interfaces in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How helpful was Calico in organizing work between you and your partner?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

How intrusive or distracting were Calico's features to the design experience?

-2	-1	0	1	<u>2</u>
Very Intrusive	Somewhat Intrusive	Not Intrusive	Somewhat Intuitive	Very Intuitive

How helpful was Calico overall in completing your tasks?

-2	-1	0	1	<u>2</u>
Very Unhelpful	Somewhat Unhelpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful

Would you recommended Calico to a friend for a future project?

-2	-1	0	1	<u>2</u>
Definitely Not	Probably Not	Neutral	Probably Would	Definitely Would

Do you have any other comments or suggestions on Calico:

- Maybe have grids or a way to align objects.
- It was kind of hard to view the icons on the interface.
- ~~There~~ Adding an option to create shapes like squares, rectangles, etc. would be nice and helpful.
- Customization of text would be great

Appendix D-7: Group 7

## Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

### Post Survey

Name: *patricia Chin*

Major: *Comp. Science*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
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How helpful were Intentional Interfaces in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How helpful was Calico in organizing work between you and your partner?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------

How intrusive or distracting were Calico's features to the design experience?

-2 Very Intrusive	-1 Somewhat Intrusive	0 Not Intrusive	1 Somewhat Intuitive	2 Very Intuitive
----------------------	--------------------------	--------------------	-------------------------	---------------------

How helpful was Calico overall in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	2 Very Helpful
----------------------	--------------------------	------------------------------------	-----------------------	-------------------



Would you recommended Calico to a friend for a future project?

-2 Definitely Not	-1 Probably Not	0 Neutral	1 Probably Would	2 Definitely Would
----------------------	--------------------	--------------	---------------------	-----------------------

Do you have any other comments or suggestions on Calico:

- add auto circle functions
- ~~allow more shape usage~~
- I actually find the tool Notes Plus for the iPad a more convenient app  
→ serious competition!
- allow editing of text
- maybe add a cursor so people can select shapes & forms w/o get the page muddled w/ scribbles
- so far, nice system ~~is~~

# Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

## Post Survey

Name: *Dinorah Carrisa Rodriguez*

Major: *CSE*

Class Level: Freshman / Sophomore / Junior / Senior

How helpful were scraps in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
-------------------------	-----------------------------	---------------------------------------	--------------------------	-----------------------------

How helpful were Intentional Interfaces in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
-------------------------	-----------------------------	---------------------------------------	--------------------------	-----------------------------

How helpful was Calico in organizing work between you and your partner?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
-------------------------	-----------------------------	---------------------------------------	--------------------------	-----------------------------

How intrusive or distracting were Calico's features to the design experience?

-2 Very Intrusive	-1 Somewhat Intrusive	0 Not Intrusive	<u>1</u> Somewhat Intuitive	2 Very Intuitive
----------------------	--------------------------	-----------------------	--------------------------------	---------------------

How helpful was Calico overall in completing your tasks?

-2 Very Unhelpful	-1 Somewhat Unhelpful	0 Neither Helpful nor Unhelpful	1 Somewhat Helpful	<u>2</u> Very Helpful
-------------------------	-----------------------------	---------------------------------------	--------------------------	-----------------------------

Would you recommended Calico to a friend for a future project?

-2 Definitely Not	-1 Probably Not	0 Neutral	1 Probably Would	② Definitely Would
----------------------	--------------------	--------------	---------------------	-----------------------

Do you have any other comments or suggestions on Calico:

I like how dynamic it is. Very useful when you need to visualize and do pseudo code for projects, web pages, etc.

It allows you to instantly see how things will look and modify it accordingly.

Seems that it would be useful for design teams. Or CS classes where you need to visualize data structures.

I would like for there to be an option where you can chose to not write anything. It was annoying having to erase lines that were accidentally created while

I was trying to drag an image.

## Appendix D-8: Statistics

Our participants consisted of **1 Freshman, 9 Juniors, 3 Seniors**, and **2** that didn't indicate their class year.

All of our participants were majors within the ICS school at UCI.

On average, our participants found that scraps were **very helpful** in completing tasks.

On average, our participants found that intentional interfaces were **neither helpful nor unhelpful** in completing tasks.

On average, our participants found that Calico was **very helpful** in organizing work between partners.

On average, our participants found that Calico's features were **not intrusive** to the design experience.

On average, our participants found that Calico was **somewhat helpful** in completing tasks.

On average, our participants **probably would** recommend Calico to a friend for a future project.

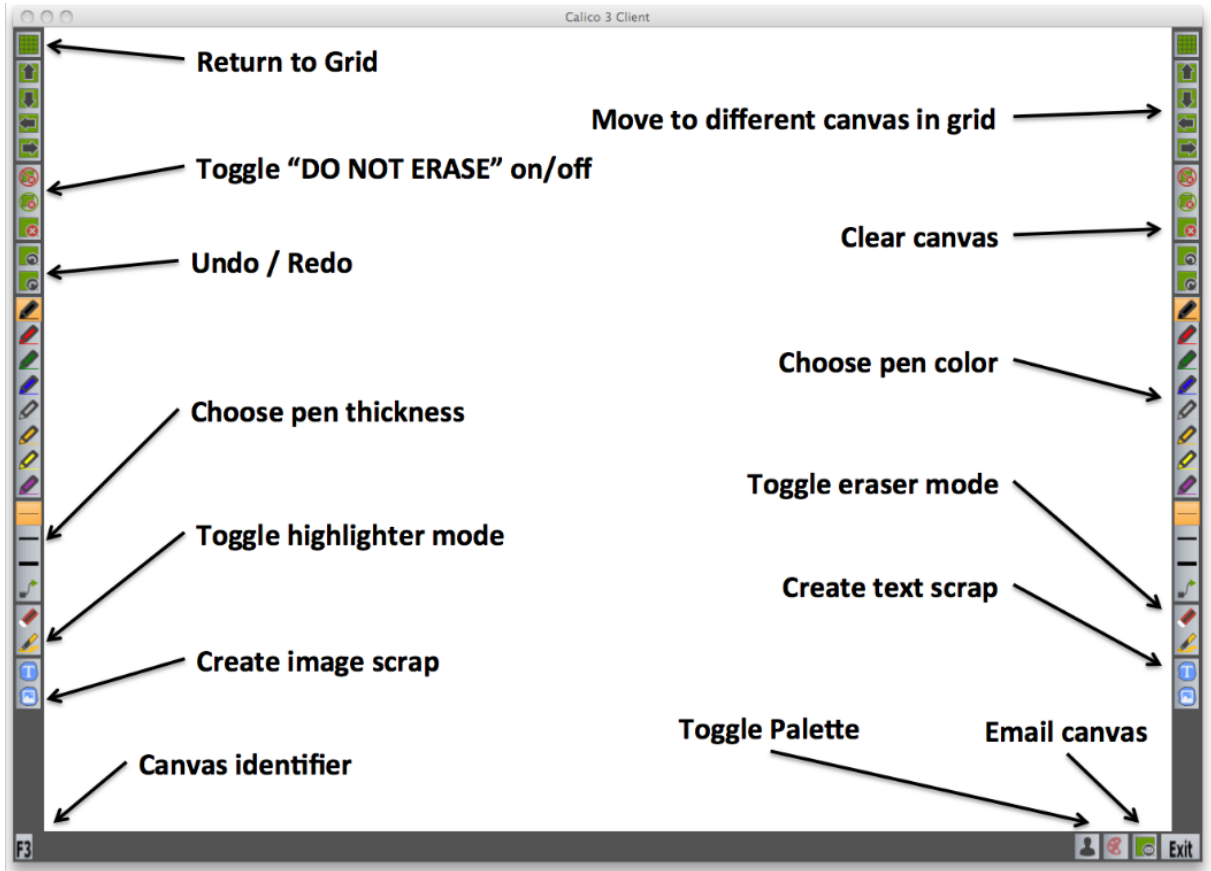
There was a wide variety of suggestions, however the suggestion that appeared multiple times was that the **icons were not intuitive enough**.

## APPENDIX E: CALICO SCREENSHOTS

These are the screenshots of the designs that the participants made.

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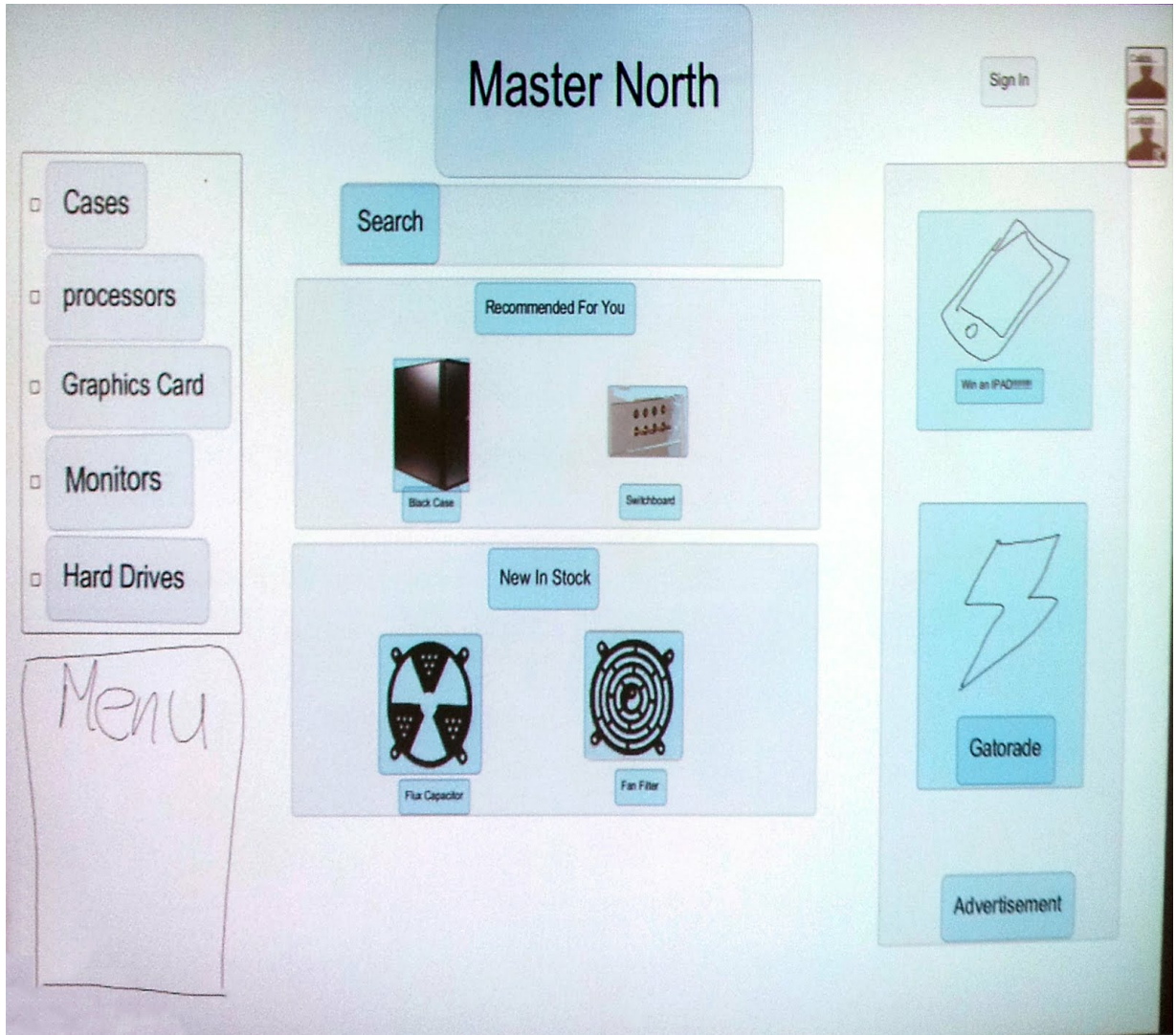
### Appendix E-0: Interface



Appendix E-1: Group 1



Appendix E-2: Group 2



**Appendix E-3: Group 3**

Unavailable due to error by instructor.

# Appendix E-4: Group 4








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### PRODUCTS

 \$19.95	 \$19.95	 \$19.95
 \$19.95	 \$19.95	 \$125.95
 \$125.95		

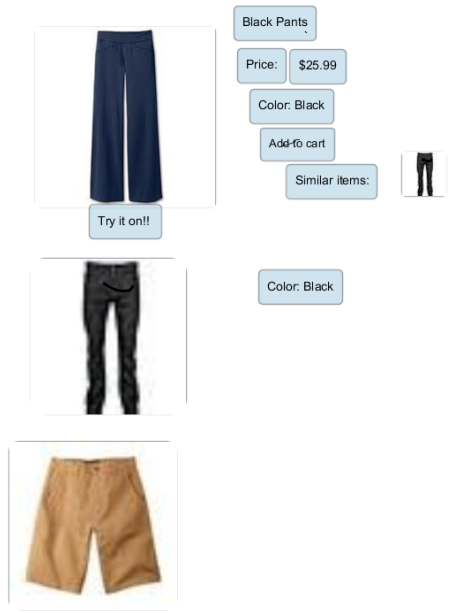
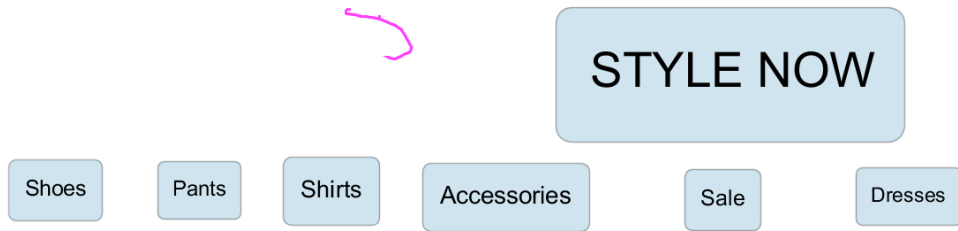
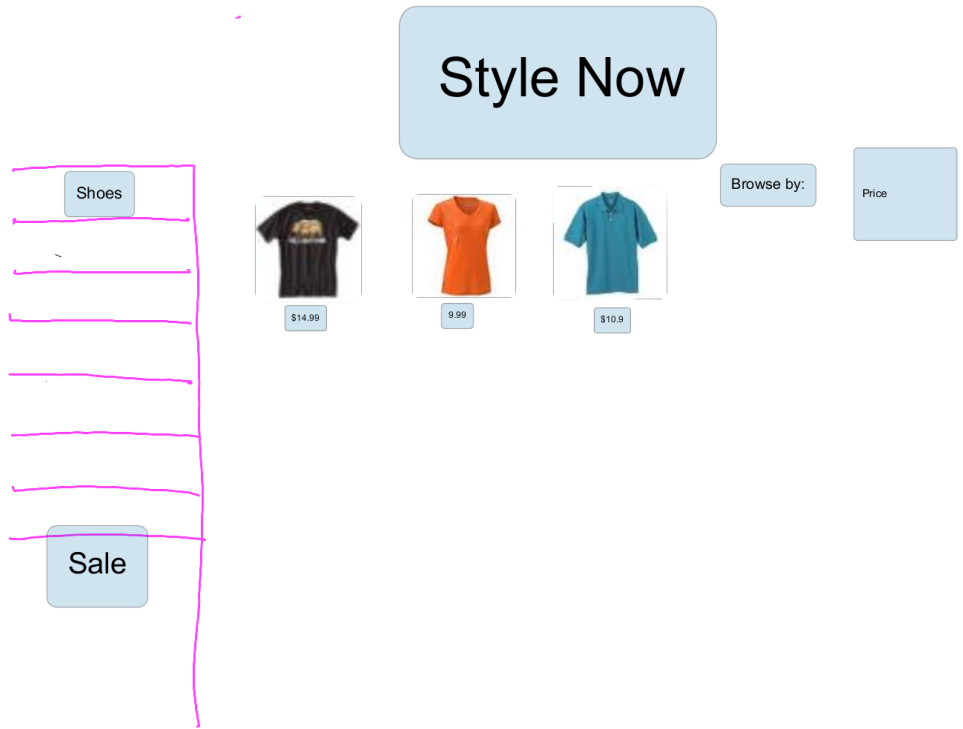
### Shopping Cart

	Qty	1	\$45.95
	Qty	1	\$19.95
	Qty	1	\$79.95
	Qty	1	\$125.95





# Appendix E-5: Group 5



## Appendix E-6: Group 6

Style



## Appendix E-7: Group 7

## **APPENDIX F: VIDEO RECORDINGS**

These are the recordings of the participants during the user study.

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### **Appendix F-1: Group 1**

<http://youtu.be/2wsdhG2IFhs>

### **Appendix F-2: Group 2**

<http://youtu.be/aPKN2cc8vYM>

### **Appendix F-3: Group 3**

<http://youtu.be/YrL29I5obZI>

### **Appendix F-4: Group 4**

<http://youtu.be/WAZqWmTlrTY>

### **Appendix F-5: Group 5**

<http://youtu.be/1ZTcv5IJLVQ>

### **Appendix F-6: Group 6**

<http://youtu.be/6gkB0IR7uzk>

### **Appendix F-7: Group 7**

[http://youtu.be/0ahIL1\\_51H8](http://youtu.be/0ahIL1_51H8)

# APPENDIX G: OBSERVATION LOGS

These are the scanned images of the observer's notes.

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## Appendix G-1: Groups 1 - 4, Page 1

### Informatics 132 Calico User Study

Saad Ahmad, Jola Bolaji, Melvin Chien, and Maxwell Taylor

#### Log

Log #	Date	Instructor	User 1	User 2	Comments
1	5/21/12	Maxwell	Faraz Ahmad	Syed Zaidi	<p>Comments: Didn't like Eraser mode, switching back to Pen - Faraz</p> <p>Moving scraps around - Arif</p> <p>Sensitivity - Arif</p> <p>Copying scraps - Arif</p> <p>Ease adding to pallet - Faraz</p> <p>Ease of typing scraps</p> <p>Switching pen colors - Faraz</p> <p>Use of undo button</p> <p>grabbed scraps together</p> <p>Making Permanent square scraps</p> <p>Arif Pointer to instead of clicking &amp; making dot</p> <p>undo button - Arif</p>
2	5/21/12	Saad	Michael Vorobyov	Ahmed Dada	<p>Comments: Scrap stuck to background, vanished. Does not use as many scraps as prev group</p> <p>Left board multifunction, broke working on one board</p> <p>too small</p>
3	5/22/12	JOLA	Sindhora Kuchibhotla	Shama Kawany (arrived late)	<p>Comments: Tutorial took 10 minutes stuck in certain modes</p> <p>Users having trouble recognizing icons</p> <p>Change color of font for text scraps</p> <p>Need to focus on model in script</p> <p>Undos server-side changes</p> <p>Put groups of scraps in palette</p> <p>Dragging items from palette is slow, buggy</p> <p>Tried making scrap inside scrap. Had accidentally selected other one.</p> <p>Didn't use intentional interface</p>
4		Melvin	Swati Bhonsle	Nick Chikhaia	<p>Comments: CONCUR. Tutorial time should be changed to ten minutes</p> <p>User 1 circled scraps from palette to move them</p> <p>User 2 moved to write on User 2's board</p> <p>User 2 had trouble trying to resize things... consistency w/ other known formats</p> <p>User 1 tried to undo her own stuff, but undid user 2's</p> <p>User 2 wanted to "add text" but making it look like a button</p> <p>User 1 often pointed to canvas w/ her finger and made many stray</p> <p>User 2 tried to erase a scrap when he was having trouble deleting it.</p> <p>User 1 wanted to select a line (not a row)</p> <p>User 2 wanted to know if he could edit the text in a text scrap.</p> <p>User 1 tried to delete a scrap</p> <p>User 2 used "T" button for text scraps instead of enter.</p> <p>User 1 messed in their canvas design. Didn't want to start a new video vs. write sketches</p> <p>User 2 successfully used temp scrap to move a large group of items from palette</p>

User 1 wanted to select a line (not a row)

User 1 as well →

User 2 wanted to know if he could edit the text in a text scrap.

User 1 tried to delete a scrap

User 2 used "T" button for text scraps instead of enter.

User 1 messed in their canvas design. Didn't want to start a new video vs. write sketches

User 2 successfully used temp scrap to move a large group of items from palette

Appendix G-2: Groups 1 - 4, Page 2

→ one user works as an advisor

Users like to use the enter key to add more text.

Simpler access, think mostly of ads.

Amazon style layout. Images play large part

One types, other writes in how they work

Users want to align results.

Not much palette use.

Appendix G-3: Groups 5 & 6, Page 1

<p>user got so tired that they used many scraps until it was time when they were reminded what scraps were.</p>	<p>Date 5/22/2012 Time 7:08 PM</p>	<p>Instructor Melvin Observer Jola</p>	<p>User 1 Angeline Phon Gray User 2 Francesca Amparo</p>	<p>Comments Users wanted to know how to make lists of images from palette Users used eraser to clear stray marks. Bug: "Reconnectivity to backup server" User 1 pressed scrap button multiple times and it got larger. Users didn't create new canvas just entered empty one. Users switched interchangeably between fingers and pens User 1 made typo, couldn't fix it (longer phrase) User 2 tried to erase scraps, User 1 helped her User 2 wanted to use old canvas so zoom, but user 1 kind of shingled. User 2 seemed to prefer fingers but not son in her backpocket in case something didn't click.) Users after finger they were an eraser made but quickly remembered. Users had trouble accessing scraps and edges were offscreen.</p>
	<p>Date MAY 25, 2012 Time 1:00 PM</p>	<p>Instructor Maxwell Observer Melvin</p>	<p>User 1 Kelly Yin User 2 Angela Li</p>	<p>Comments Change colors of fonts Lots of stray marks Temporary scraps disappearing</p>
<p>6</p>	<p>Users got more "messy" as time went on Does not fit too well for more creative design <del>Resting lists</del> Resting lists Did not use text scraps → more creative Did not make multiple canvases per system Somewhat ignored intentional <del>rest</del> interfaces</p>			<p></p>

Appendix G-4: Group 7, Page 1

	Date	Instructor	User 1	Comments
<p>Camera in 0 m at 6:10 Index User 2 7 is short and cannot reach lap. Timer at is not except for pen</p>	<p>5/25/2020 5:51 3:20 PM</p>	<p>Melvin Observer: Max</p>	<p>Patricia Chin User 2 Dimerdi Carrillo</p>	<p>2 is surprised at a erasing whole stroke User 2 uses highlighter User 1 wishes she could erase object partially. User 2 wants to draw w structures that have small parts</p>
	<p>Date</p>	<p>Instructor: + does</p>	<p>User 1</p>	<p>Comments</p>
	<p>Time</p>	<p>Observer</p>	<p>User 2</p>	

Appendix G-5: Group 7, Page 2

users want to model a map.

users decide company wants their title on

the pixelated. user almost pressed the big x.

users start triggering buttons accidentally

users trapped in eraser mode for a while confusion.

users want "edit text" function

user

must copy??

intentional interface - reading at least  
(confusion / zoom level)

users on map, take <sup>on users</sup> while to decide  
users realize they can make shapes

users want circles

many labels in this design.

many, many labels

users quiet down.



## **END OF DOCUMENT**

This is the end of the report.

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