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Interactive Origami

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Introduction

Thinking in retrospect of the past two years, I clearly remember how much I did feel uncomfortable dealing with the computer. Perhaps it was because of my deep-rooted thought that the computer was functionally designed and equipped for serving engineers and accountants rather than artists or designers.

As a matter of fact, that technology is going forward and wrapping around people's lives. Computer technology is an outgrowth which plays an important role in our society, including the process of creating art works. For this reason, I was qualified to come to the United States to broaden my vision with the responsibility of bringing back invaluable experiences to share with other people in my country. This caused me to be here, construct the thesis project, give birth to this written report, and change my attitude about working on the computer.

Since the Macintosh-system platform was designed to take advantage of text and graphics, I consider it a good tool for designers to creatively integrate information and ideas in one system. Also its user-friendly atmosphere helps alleviate the pressure of the man-machine interaction. Macintosh features powerful technology that is easy to use. It turned me from a brand-new user who did not know how to start up a computer to a slightly expert one.

Today, having already started it up more than thousands of times, I somehow find myself at a loss to shut it down. Although you already physically shut the computer down that only means you turn off the power. Your art work will never reach the end as long as it is based on a changing technology. However, computer technology does fascinate me to dig down to its essence from the viewpoint of a graphic designer.



Thesis Proposal

In this thesis project, I attempted to create an electronic book which introduces and demonstrates "Origami: The Art Of Folding Paper." The process progressed through the use of Macintosh software applications along with an interactive-design technique. The user interface design is accomplished by taking advantage of a personal computer's utilities: Graphic Application, Data Storage, and Computer Generated Animation.

• Why Interactive?

Interactive media was introduced to me since the first time I investigated HyperCard, the program which provides a platform for interactivity by empowering the user to manage information using nearly any type of media including text, graphics, sound, video, voice and animation. Users can build applications for mainframe interfaces, multimedia software and personal information managers. Basically Hypercard provides interactive features built into its own computer language which allows us to author and customize our project by scripting. This feature draws my interest and feeds my enthusiasm to construct my own interactive project. Moreover, interactivity allows users to shape their own experiences and gives them the flexibility to view important information in a nonlinear way-one that is unique to them and one that attracts and holds their attention. The unique part about interactive media is that different people can start at different sections. In other words, it does not have to be a serial process that requires people to start at point A and ultimately get to point Z; they can start anywhere and proceed in any sequence.¹

• Why Origami?

Origami is the art of folding uncut sheets of paper into decorative objects such as birds or animals. The word for this ancient Japanese art comes from *Ori*-, meaning "folded," and *-Kami*, meaning "paper".

There are two reasons why I chose "origami" as the content for my thesis idea. The first one is the result of my personal fascination with this kind of art, which I would call the art of intelligence and economy. I realized I would dedicate most of my time associating with

this thesis project, so I preferred to give myself less pressure by working on the topic I enjoy most.

The first reason might not be so rational without the strengthening of the second one: the appropriateness of using the computer as a medium to introduce origami. Origami draws so many people's interest but can be accessible to only a handful because of the insufficient and ineffectual origami books. Most of the origami books in the marketplace have a poor folding demonstration which frustrates the readers.

Since technology will soon make the home an information center and computers with interactive exploring programs will soon become as common as an encyclopedia in one's house, there is a great potential for the computer to be used as an instructional tool. Computers allow us to input and combine art, animations, graphics, video-scanned images, sound, and text into multi-sensory displays which cannot be accomplished by any print media.

• The Objective of the Project

The purpose of this thesis is to construct an interactive project by utilizing the Macintosh platform along with its various software applications. I would use my thesis project as a model to impress audiences not familiar with computer capabilities, and give them a broad vision of how personal computers can serve our needs by providing other design solutions, bringing our world closer to us.

The proposed target audience is primarily set to anyone who is interested in the art of folding paper. Since origami can be categorized by its folding procedure into three levels: easy, intermediate, and a more complex level, there should be nearly no limitation for everybody to join the paperfolding based upon their individual abilities. But I realize that origami requires some skill and patience to accomplish each model successfully. Therefore it is well-suited for adults rather than children. Hence, my thesis project was designed for an adult use.



Thesis Development

• Research

Before I decided to pick origami as my thesis topic, I already possessed plenty of origami books, but unfortunately none of them had adequate information about the history of origami, nor did the books in Wallace Memorial Library. Last fall break, I took a chance to visit New York City with the aim of searching for a good origami book. On the day I stopped by The American Museum of Natural History, I ran across "The Friends of Origami Center of America" which was establishing an exhibition about origami.

The Friends of Origami Center of America is a not-for-profit, tax-exempt educational and cultural arts organization which is dedicated to the sharing of paperfolding in America and around the world. There are more than 1500 enthusiastic members in 49 states and 19 countries, and there are regional groups in cities all over America. I was extremely excited when I realized that so many people share the same interest as I do, and that there even is a real origami organization that exists in the world. The Friends of Origami Center of America provided me with some additional information that helped my project have something to rely on, that it was not just built of castles in the air as before.

• Software and Hardware Concerns

Being bound to construct an electronic book incorporating an interactive functionality, I selected to build the main project within the environment of SuperCard: the program that gives users the power to create custom Macintosh software. It combines a scripting environment with graphics-creation capabilities and provides a multimedia platform by importing and combining video, digitized sound, animation and graphics². SuperCard's graphics-creation environment provides a 256-color look-up table, and any objects, such as graphics or texts, in SuperCard can be a functional button. These two distinguishing features give users more freedom of design and make SuperCard far more outstanding than HyperCard.

Some short-animated movies were added to colorize the project. They were all done in MacroMind Director, some were incorporated with Swivel 3D. MacroMind Director is an interactive, multimedia presentation and animation authoring software. The modules allow



the user to combine graphics, text, sound, animation, special effects, music, and video for communicating messages with impact³.

The main problem of this thesis project which I intended to explore was the folding-demonstration technique. I thoroughly investigated two applications, MacroMind Director and Swivel 3D, in order to find the better approach. Swivel 3D Professional is a three dimensional color graphics and animation program that can be used to create detailed illustrations or to conceptualize and visualize complex products with dynamic linking, which is Swivel's feature of attaching objects together to build composite objects out of several smaller ones and it can affect how one object moves in relation to another. Swivel's object-manipulation interface allows the user to quickly and easily create, rotate, and move objects⁴. The folding-demonstration can be accomplished within Swivel 3D only with a very simple model due to the limitation of the linking property. Another experiment was done using MacroMind Director by scanning the folding procedure step-by-step and importing it to MacroMind Director as castmembers, then playing them on screen frame-by-frame. This method was quite simple but takes more time to demonstrate each model. For better demonstration quality, more castmembers are required to smoothen the movie, but the movie file must be bigger accordingly.

During the first thesis committee meeting, I investigated this problem with the three professors on my thesis committee. Prof. Mark Collien introduced QuickTime to me at first as another solution approach. QuickTime is a set of protocols developed by Apple Computer for showing video, animation and playing a synchronized soundtrack. Its features seemed to suit my requirements. I had studied it for quite sometime to make sure it did work well within the SuperCard environment. Eventually I decided to use QuickTime to solve the folding-demonstration problem.

Most of the graphic elements were produced, retouched and edited in Adobe PhotoShop, which is an image processing software. Also Adobe TypeAlign, one kind of desk accessory, was used to specialize text effects.

The hardware involved in this project was based on the existing equipment in the department: Macintosh IIfx computer, the NTSC (National Television System Committee) Digitizer with Mass Micro-



systems ColorSpacell video graphic Board, Farallon MacRecorder, and Canon Hi8i Video CamCorder. The Macintosh IICI is a high performance computer with built-in video. The system's performance is provided by a Motorola 25 MHz 68030 microprocessor which is an acceptable speed for running any interactive projects. The ColorSpacell board allows a high quality interface between the computer graphics RGB world and the NTSC video standard. MacRecorder Sound System is a sound digitizer that allows recording, editing and mixing of voices, music and sound effects. Last of all, the Canon Hi8i Video CamCorder, is a portable video CamCorder used to record the movie real-time onto a Hi8i video cassette. It can be transferred into digital signals and played back on the computer by using MoviePlayer application along with the ColorSpacellfx video graphic board.

• Design Process

The design process was based on the information which I researched. Since I intended to construct this thesis as an interactive project, therefore the information was analyzed, synthesized, and reorganized in order to rationally form the project with an interactive feature.

Interactive Origami

The project began with the initial screen used to greet the user (Figure 1). This main screen acts as a platform that provides three terminals: 1) Getting to Know Origami: the section providing general information about origami, 2) Getting to Love Origami: the section representing the essence of origami by giving the user a real-time folding demonstration from a sheet of paper to a finished model, 3) Getting to Join Origami: the section for those who already fell in love with origami and want to be a member of an origami organization. I call this screen "Main Menu" since it acts as a junction for navigation within this project.

I located an image of a paperfolding-crane on this first screen, scaled it up then embossed it offset from the 50% gray background. The crane is a traditional Japanese symbol of good luck and the origami crane is a symbol of international peace. Also it is the most popular origami model. The emboss technique was applied to many graphic elements in this project because it gives a paper-like feeling.

I used the images of origami paper to be the logos of the three sections mention above. Each image shared the same contour but was slightly different in color and pattern. Their appearances unite the design throughout the project, although each section has its own color scheme and design layout. By clicking on these images, the user is gradually brought into the desirable section.

The user interface design was concerned with the navigation path, which would enable the user to navigate rationally following the hierarchical information. All the buttons are equipped with an auto-highlight function providing visual feedback to the user to indicate which item has been chosen and something must be happening when clicked to execute certain procedures. Almost all the buttons are labeled with a verb that clarifies the action that it performs. I also provided a cancel button wherever it is necessary.

The alert boxes were used throughout the project in order to prevent the user from any undesirable executions and keep the user in control.

Getting to Know Origami

On the "Know Menu" there are four topics: "Folding History", "Materials and Tools", "The Language of Origami", and "Folding Tips" (Figure 2). Each topic brings the user to the corresponding information panel (Figures 3 - 6). I considered that it would be quite boring for the user to perform read-only tasks within the whole section. Therefore I added a short animation sequence for each topic. These MacroMind Director movies were executed in SuperCard under XCMD's functionality. Each will play continuously as a loop until any mousedown events occur.

Getting to Love Origami

I categorized origami models into three categories. I named it "The Zoo" for animal models, "The Garden" for floral models, and "The Store" for other miscellaneous models (Figure 7). Each category links directly to its sub-menu screen. On the sub-menu screen there are images of the origami model corresponding to its category (Figure 8). Each image was equipped as a button which brings the user to the folding demonstration level of each model. This final screen in the hierarchical structure was placed with three additional



buttons: "NOTE", "PAPER", and "DEMO" button (Figure 9). "NOTE" button provides some specific folding tips for that model. "PAPER" button if clicked will cause the connected printer to print out the paper which has a folding guideline that would help ease the folding task (Figure 11). "DEMO" button plays the QuickTime movie which was installed (Figure 10). Only one movie file was used for each category due to the limitation of disk space. However, it is enough to fairly represent the concept of this prototype. The movie-control panel simulates the basic function of a VCR controller system. The user can simply stop, play, play fastforward, or play the movie fast-backward in the same way as a household VCR.

Getting to Join Origami

I set up "The International Origami Center" as an organization which is in charge of this interactive program. On the first screen of this section there is a brief introduction about the Origami Center (Figure 12). The Origami Center's logo, located on the left hand side of the screen will be placed on every screen throughout this section. The "MEMBERSHIP" button acts as an entrance to the Center. Clicking on this button will cause the short animation sequence to occur which psychologically notifies the user that some procedures are being processed. Then the user will be asked whether he is a new member (Figure 13). If yes, then he will be required to complete the registration form for becoming a member (Figure 14). Only a registered member can access the member-only-section (Figure 15) which allows the user to order origami books and supplies via computer (Figures 16 - 18), or update himself with an on-line information system (Figures 19 - 20). Moreover, the Center provides an electronic mail service so the members can directly intercommunicate with each other (Figure 21).



Figure 1: Interactive Origami's Main Menu



Figure 2: Getting to Know Origami Menu (Know Menu)

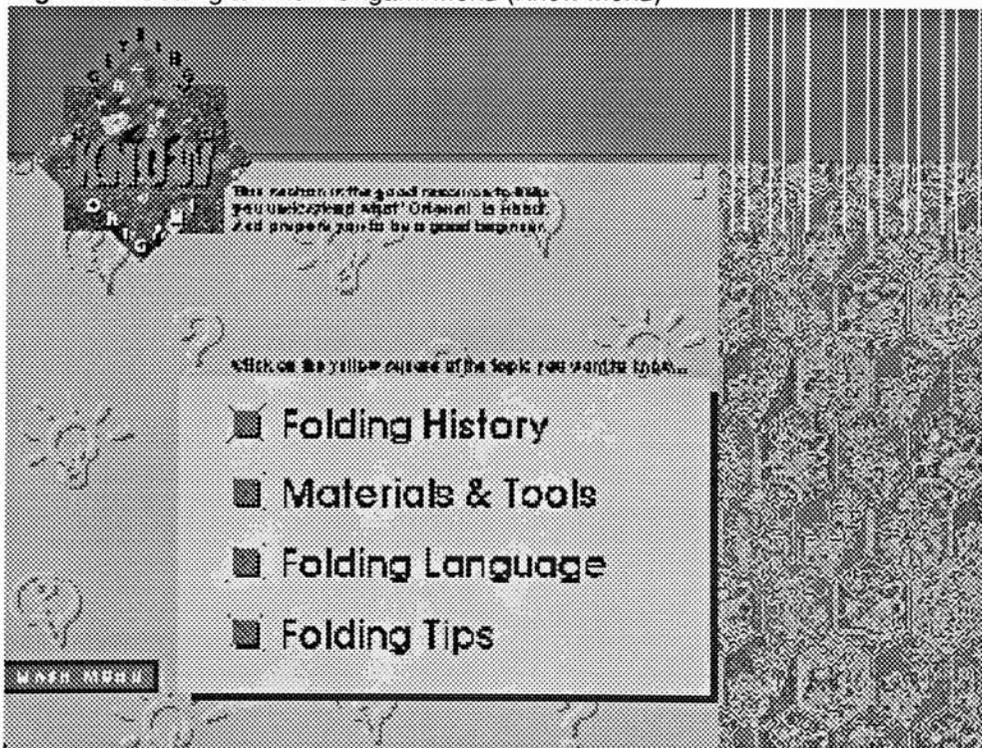


Figure 3: Topic 1 of Know Menu: Folding History

Folding History

Papermaking originated in China around the first or second century A.D. and reached Japan during the sixth century. The Japanese called the new art form *washizumi* (the name means "Four o'clock" in both "and" and "paper") and cultivated it in a form of architectural art.

... Origami is an art of economy. A few simple creases enable us to fold and modify the square slightly, and an entirely new form appears. To the Japanese, versatility, the essence of a completed, original style depends on the creative eye for form, structure, and proportion.

... Over many generations, the Japanese has developed and refined a great repertoire of models that are stylized, abstract and often resembling birds and animals or practical objects. By the Heian period, from 794 to 1185, origami had become a part of the everyday life of the Japanese nobility. Even paper was not a mass used product; consequently, no papermaking was a profession only the rich could afford.

... When paper became commonplace enough to be used by everyone, origami had a new ceremonial role, as a means of social stratification.

KNOW MENU
WASH MENU

Figure 4: Topic 2 of Know Menu: Materials and Tools

Materials & Tools

In theory, at least, the only tools you need for origami are your hands, and the only material is a sheet of paper. In practice, however, there are a few more tools that may simplify matters.

PAPER: The best paper is thin and crisp and absolutely square. Basically no special paper is required and you can use any paper you happen to have at hand. Just make sure to crumple the paper if you are using paper stained on both sides, the color you wish to show on the outside should be face down when you begin.

SCISSORS: A pair of scissors, or us 8-inch knife would be useful for cutting paper.

RULER/STRAPE: A horizontal, or a letter opener is a useful tool to have as a hand to slide creases.

TABEZERS: In complex folds, a pair of needle-nosed tweezers will come in handy.

SMOOTH BOARD: It will help to have a smooth horizontal surface to lean on. Though many of Japanese fold in the car.

KNOW MENU
WASH MENU

Figure 5: Topic 3 of Know Menu: Folding Language

Folding Language

Click each image on the left of these definitions to see the folding demonstration.

VALLEY FOLD: A piece of paper has two sides. It can be folded in either of two directions. If you bring the lower edge upward, then it's a valley fold.

MOUNTAIN FOLD: To make a mountain fold, on the opposite direction with a valley fold, bring in the lower edge of paper underneath.

INSIDE REVERSE FOLD: Paper is folded around only along the single crease. If you spread the open edges of the paper, and turn the top portion inside out, then it is an inside reverse fold.

OUTSIDE REVERSE FOLD: To make an outside reverse fold, crease first to form crease of the reverse fold. Spread the open edges of the paper, and turn the top portion outside in.

KNOW MENU
WORK MENU

Figure 6: Topic 4 of Know Menu: Folding Tips

Folding Tips

1. Choose suitable paper and size to required task and use.
2. Fold precisely and carefully, especially at the most points of corners.
3. Work on a hard surface, so that all folds and creases can be smoothed with smoothness. The more the smoothness of a fold, the more beautiful the finished work.
4. Follow each step carefully in the sequence given. Do not eliminate or skip a step.
5. If required to work to you, get assistance by positioning the hands correctly. It is necessary to (however) have so many different forms are created out of a specific basic form.
6. Your paper should be folded right to its edge or crease, without leaving a gap, valley if it indicated to the instructions to do so.
7. Remember that paper has a thickness. Layers of paper accumulate and in the more complicated models may reach a thickness to half an inch. It is often best to leave space between two adjacent edges, so that in subsequent folds they will not overlap and bunch.

KNOW MENU
WORK MENU

Figure 7: Getting to Love Origami Menu (Love Menu)



Figure 8: Category 1: The Zoo

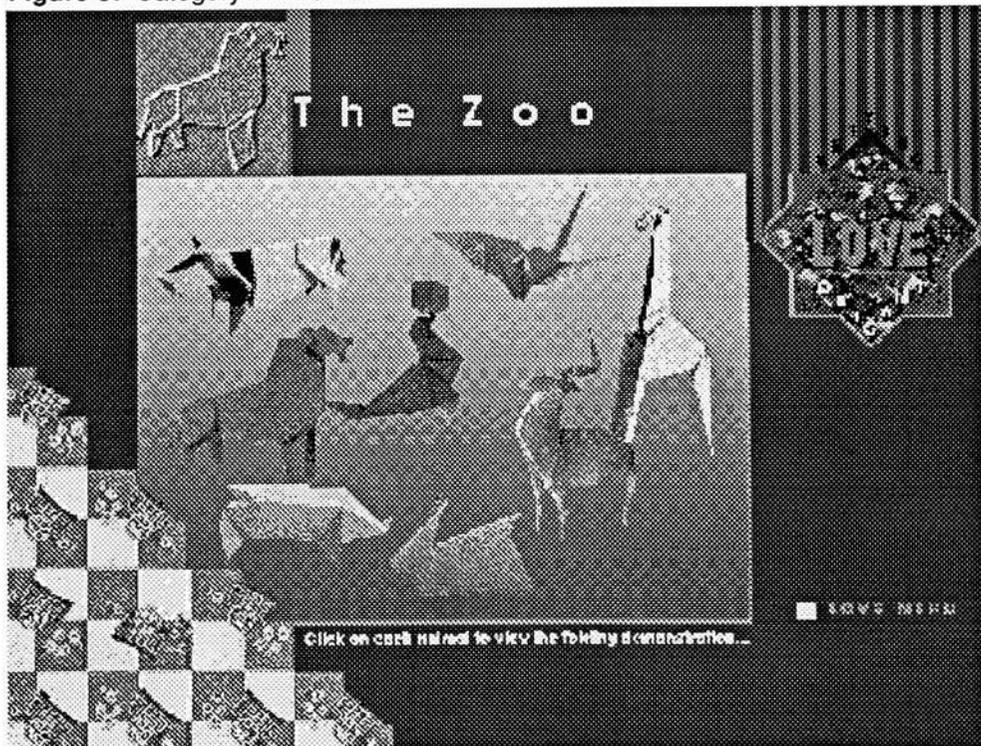


Figure 9: Folding demonstration screen

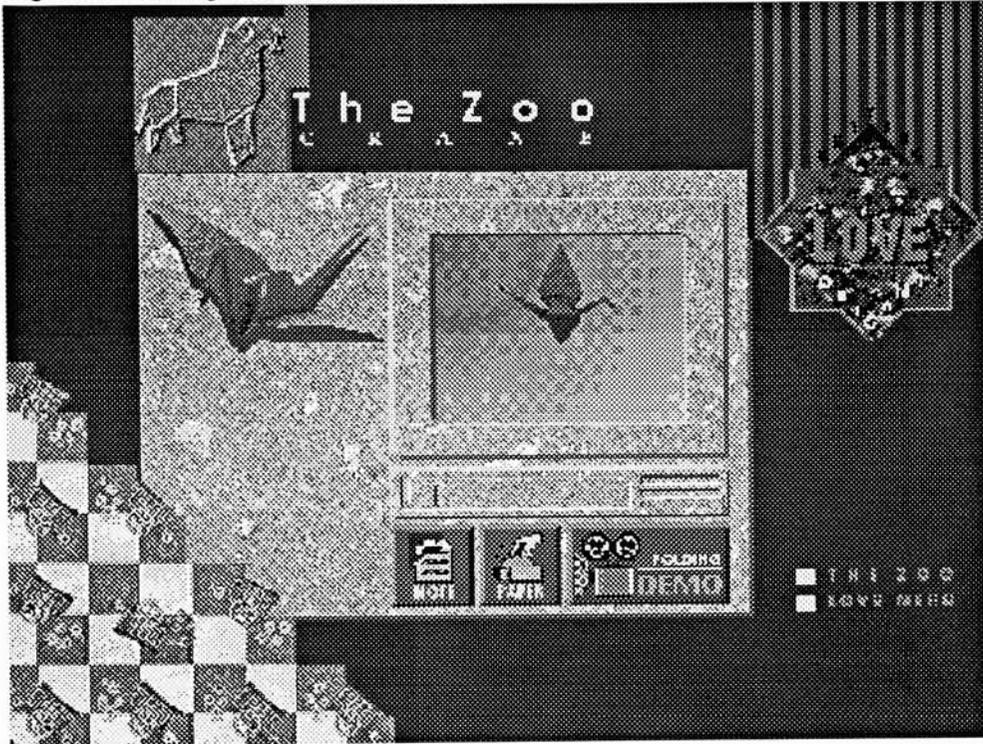


Figure 10: "DEMO" button plays the QuickTime movie



Figure 11: Paper with a folding guideline

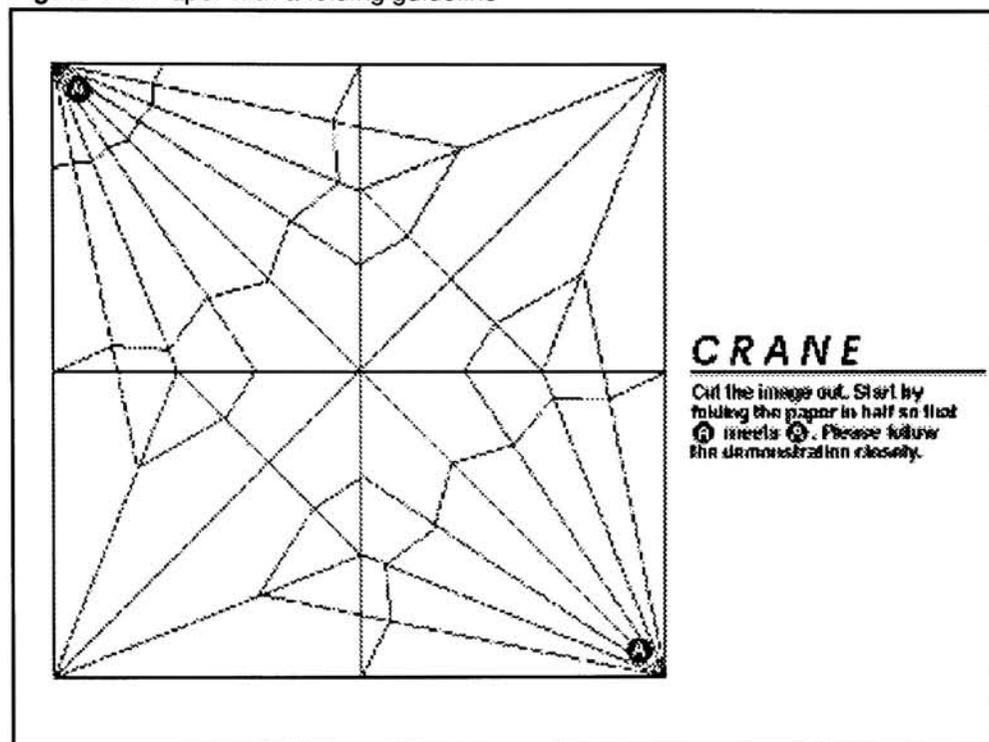


Figure 12: Getting to Join Origami's first screen

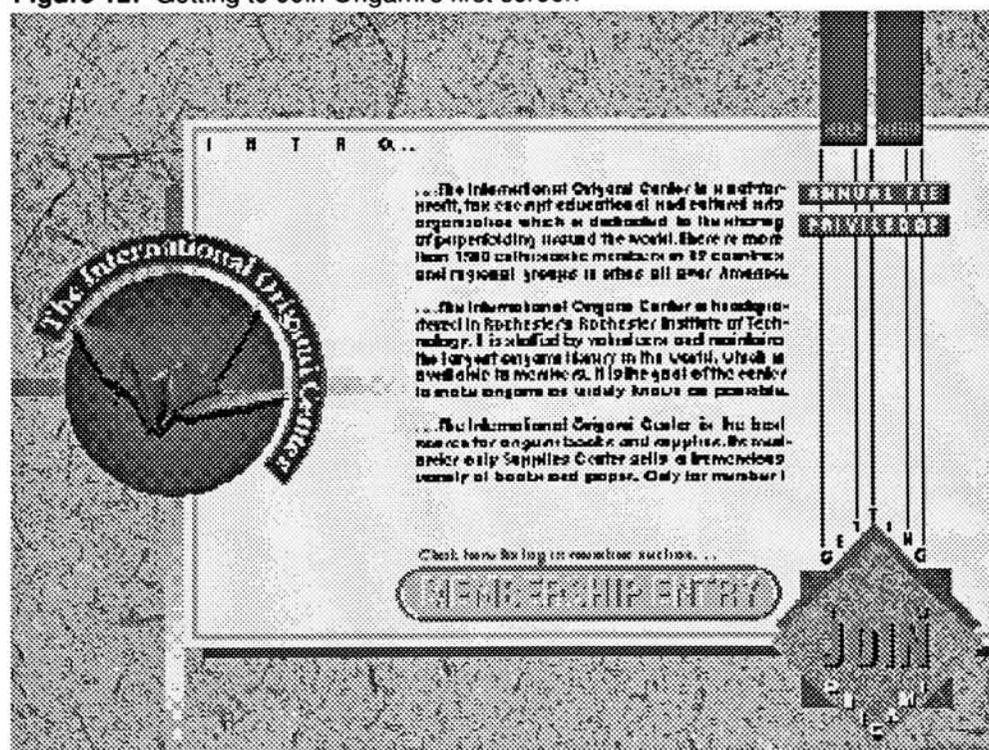


Figure 13: Classify the users' status: new or old members



Figure14: Member Registration Form

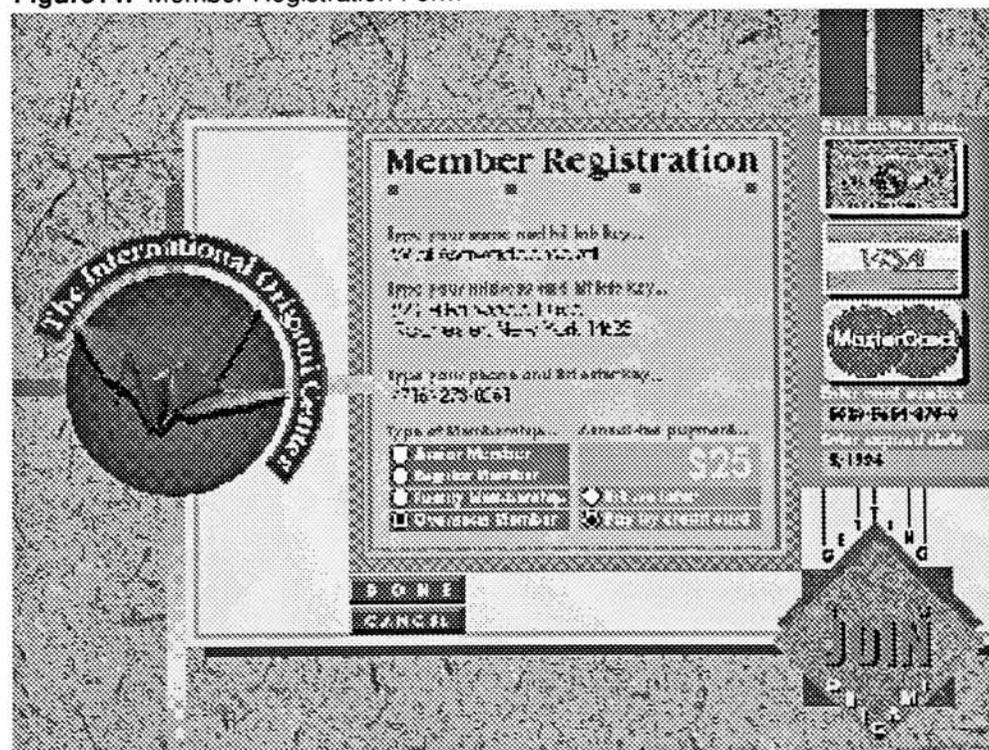


Figure 15: Member-Only Section



Figure 16: Books and Supplies Menu

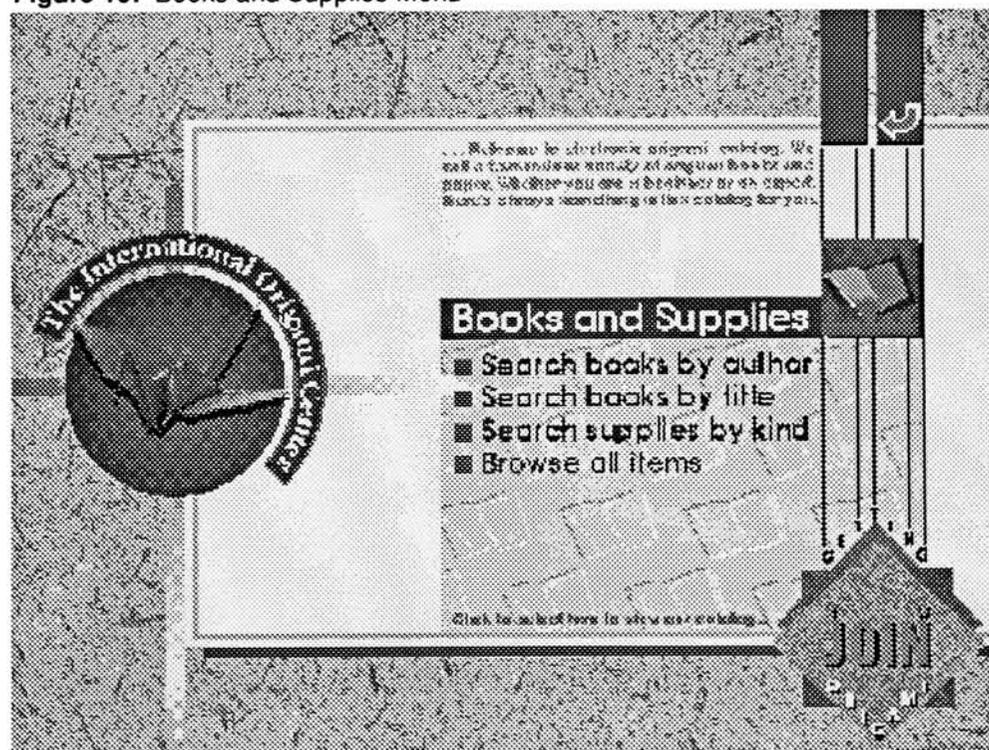


Figure 19: The Origami Center's on-line information system

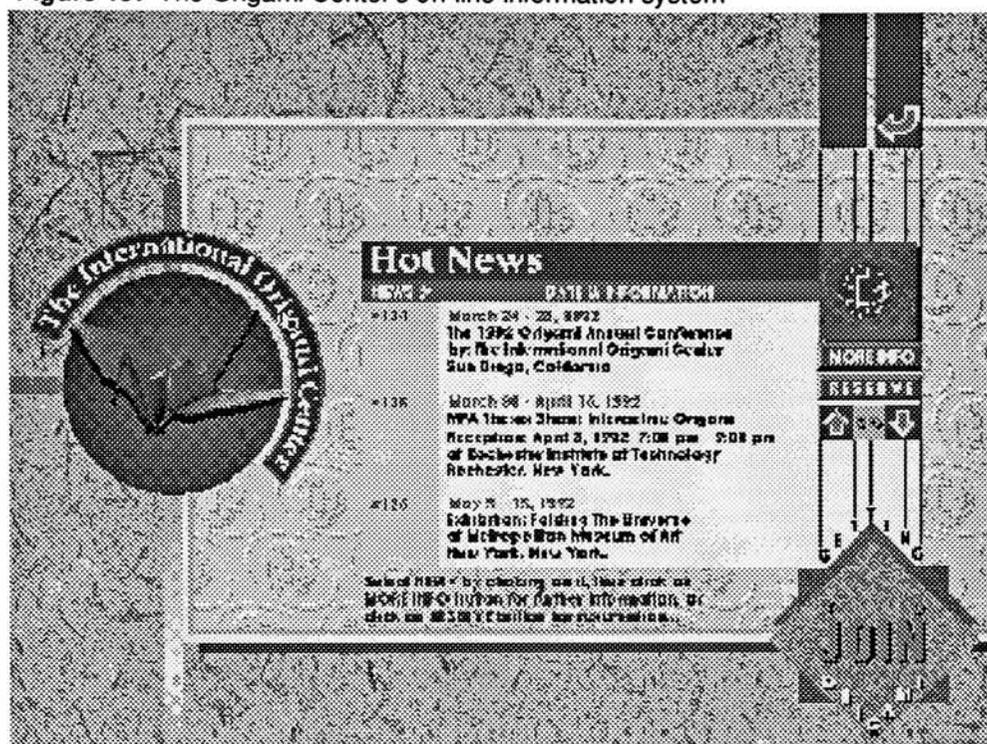


Figure 20: Reservation for the desirable event

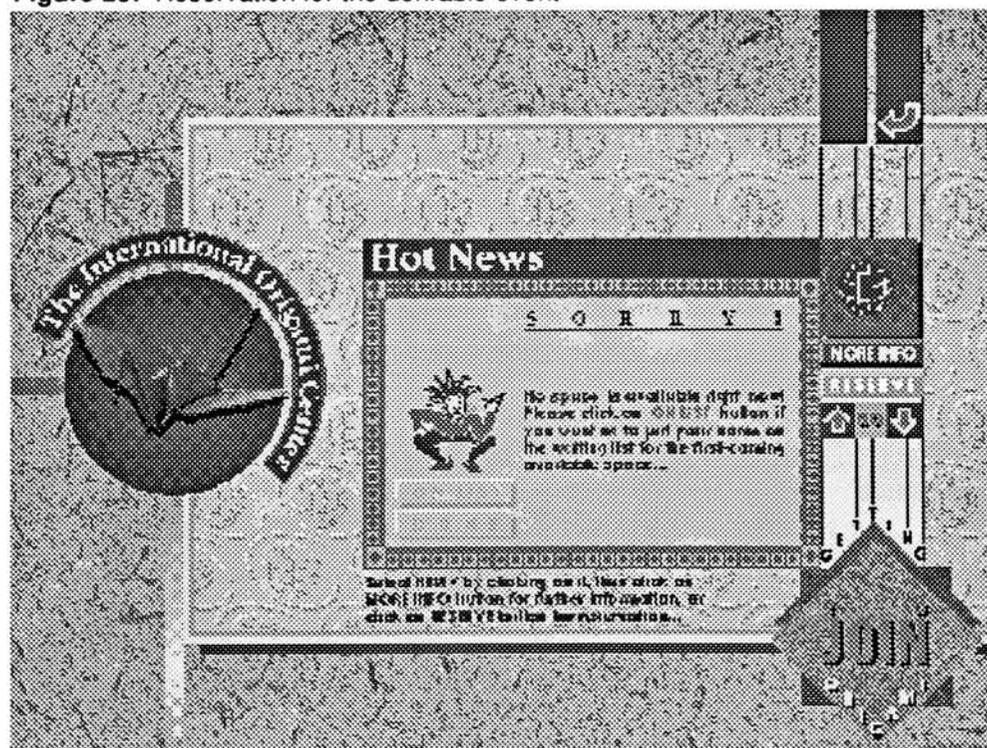


Figure 21: The Origami Center's electronic mail service

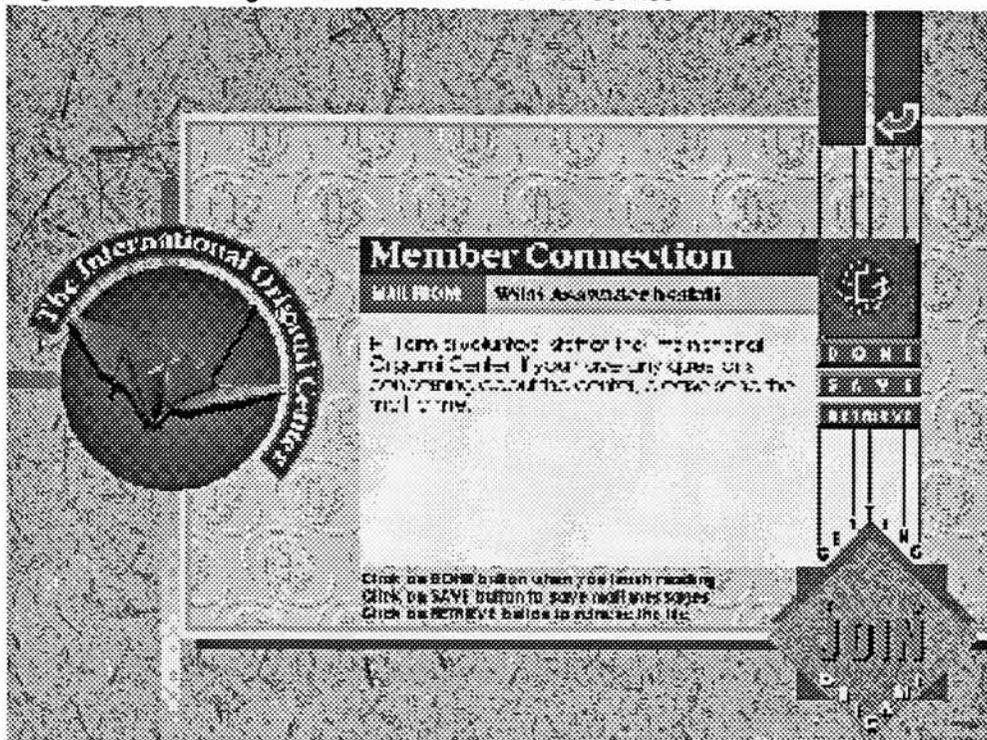


Figure 22: A dialog box appears after clicking a RETURN button



Thesis Conclusion

• Thesis Evaluation

Feedback from the Users

The thesis project was first presented to users at the thesis show on April 3, 1992. I found most of the users were very excited about the second section: Getting to Love origami, especially the QuickTime movies. Only a few got through to the third section which is the one that I spent the most time on, in trying to simulate the environment of The International Origami Center as real as possible. Perhaps the fact that it is so real causes the user to hesitate to move to the member section. I observed that most of the users would cancel the action and immediately exit the program if they were asked to pay the annual fee after filling in the registration form. So far I would conclude that motion pictures and animation sequences were better approaches to draw attention from the public.

Feedback from the Thesis Committee

The thesis committee was formed by a group of professional users who already have immense experiences on computers, so they are able to point out either the weak or strong points of my project. For instance, the extravagant use of graphic elements somehow dwindled the main content which should be dominant and the primary concern on the screen. I resolved this problem by enlarging the area which would be used to interact with the users, and stressed its dominance by applying color theory to distinguish foreground from background.

Besides, the folding demonstration would be clearer if the QuickTime movie was cut into pieces, so the users can easily view the specific folding procedure desired. But due to the required time frame, I needed to leave this prototype unchanged.

The last thing pointed out was the ambiguity of the icon-based button ( - Return Button) which I normally use to take the user back to the previous menu. For example, if the navigation path begins from "A" to "B", then from "B" to "C", and finally from "C" to "D", at "D", the return button would take the user back to "C" and from "C" would go back to "B" sequentially. I solved this problem by having the dialog box appear immediately after clicking the button to inform the user where the destination would be (Figure 22). Thus the user will never lose track of where he came from.



• Thesis Consequence

Today, as we embark on a new decade of personal computing, new and more sophisticated software and hardware is being developed to increase the potential of a personal computer which would be able to handle the vast varieties of information in the not too distant future.

The 1990s will be the decade of "information at your fingertip." This term embodies the concept of making computers more personal, making them indispensable, making them something you reach for naturally whenever you need any kind of information. And we need to connect people to each other in a way that is as interactive and personal as a phone call but that can convey information much more dense and complex. Computers must be so interesting that people feel compelled to explore. Work group communications, which today largely consists of E-mail, will have to be broadened to act as a base for other group activities such as electronic use and distribution of forms. The kind of information that it is possible to deliver and the ways in which it can be delivered will also need to expand to include sound, text, graphics and live motion on the computer screen⁵. Hence the interactive media project should be more fancy and more effective. Although technology has indeed enriched the effectiveness of communication, there is our wisdom to integrate those technological outputs rationally and shape them based on our need. As a computer graphics designer, I would solicit all of you who might be involved with this matter to review our standing. What designers need to be concerned with right now is not only how much capacity a new-coming software package can offer, but also how much we can apply our design principals to the existing resources to enhance human perception.



Endnotes

1. Apple Computer, Inc., The Apple Guide to Publishing, Presentations and Interactive Media (Apple Computer, Inc. 1990), p.30

2. ibid., p.112

3. ibid., p.110

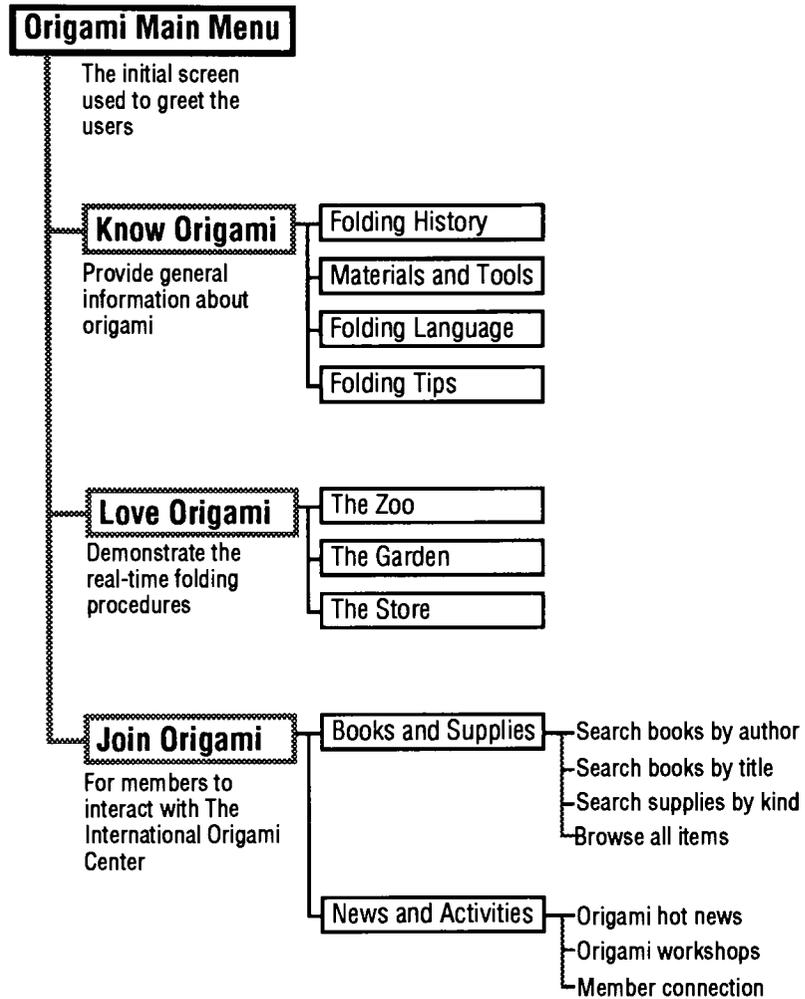
4. ibid., p.102

5. Bill Gates, "What's Ahead?," Computerworld, (October 31, 1991), p.37

6. Apple Computer, Inc., Inside Macintosh Volumn VI (Addison-Wesley Publishing Company, Inc., 1991), p.2-3



Appendix A: Project Structure Flow Chart



• Project “Origami”

```
card graphic “getting to know origami” of card “Origami”  
on mousedown  
  set the ink of me to “blend”  
end mousedown  
on mouseup  
  play “clavSwash”  
  set the ink of me to “srcOr”  
  visual iris open  
  go to cd “KnowMenu” of window “Know” of Project “KnowOrigami”  
end mouseup
```

```
card graphic “exit” of cd “Origami”  
on mousedown  
  set the ink of me to “blend”  
end mousedown  
on mouseup  
  play “Boing”  
  set the ink of me to “srcOr”  
  answer “Are you sure to exit this program?” with “Yes” or “No” at  
  300,250  
  if it is “Yes” then  
    editor  
    domenu “Quit”  
  else  
    exit mouseup  
  end if  
end mouseup
```



- **Project “KnowOrigami”**

- card graphic “history” of card “KnowMenu”**

- on mousedown
 - set the ink of me to “notsrcXor”
 - end mousedown
 - on mouseup
 - play “vibes”
 - set the ink of me to “srcOr”
 - visual venetian blinds
 - go to cd “History1”
 - end mouseup

- card “history”**

- on opencard
 - playmovie “Know.history”, movienodialogue, movienoclear, –
moviebkcolor, movieloop, movienoupdate
 - end opencard



•Project “LoveOrigami”

card graphic “theZoo” of card “lovemenu”

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "vibes"
  set the ink of me to "srcOr"
  visual iris open slow
  go to cd "TheZoo"
end mouseup
```

card graphic “crane’ of card “the Zoo”

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  visual dissolve
  go to cd "ZooDemo"
end mouseup
```

card graphic “other”of card “the Zoo”

```
on mouseup
  play "syndrum"
  answer "Sorry! Please click only on the crane." with "O.K." at-
  285,253
end mouseup
```

card “ZooDemo”

```
on opencard
  lock screen
  set the ink of cd grc "Note" to srcOr
  set the ink of cd grc "paper" to srcOr
  set the ink of cd grc "demo" to srcOr
  unlock screen
  playmovie "The Crane",movienodialogue,movienoclear,-
  moviebkcolor, movieLoop, movienoupdate
end opencard
on idle
  global movieID
  if movieID is not empty then
    QTMovie direct, movieID, idle
  end if
end idle
card graphic “Note” of card “ZooDemo”
on mouseup
```



```

global movieID
play "click"
if the ink of cd grc "demo" is "notSrcXor" then
  QTMovie direct, movieID, dispose
  lock screen
  show cd grc "Cover"
  unlock screen with visual bam door close very slow
  set the ink of cd grc "demo" to "srcOr"
  wait 10
end if
if the ink of me is "srcOr" then
  set the ink of me to "blend"
  lock screen
  show cd grc "NoteCrane"
  unlock screen with visual venetian blinds
else
  play "click"
  set the ink of me to "srcOr"
  lock screen
  hide cd grc "NoteCrane"
  unlock screen with visual venetian blinds
end if
end mouseup

```

card graphic "Paper" of card "ZooDemo"

```

on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global movieID
  play "click"
  if the ink of cd grc "demo" is "notSrcXor" then
    QTMovie direct, movieID, dispose
    lock screen
    show cd grc "Cover"
    unlock screen with visual bam door close very slow
    set the ink of cd grc "demo" to "srcOr"
    wait 10
  end if
  answer "Printing paper. Please wait..." with "O.K." or "Cancel" at
  285, 253
  if it is "Cancel" then
    set the ink of cd grc "paper" to "srcOr"
    exit mouseup
  else
    set the ink of me to "srcOr"
    set the cursor to watch
    print card "CranePaper"
    set the cursor to hand
  end if
end mouseup

```



card graphic "demo" of card "ZooDemo"

```
on mouseup
  global movieID
  if the ink of me is "srcOr" then
    play "click"
    set the ink of me to "notsrcXor"
    lock screen
    hide cd grc "Cover"
    unlock screen with visual bam door open very slow
    QTMovie Openmovie, direct,"Cup Cake:ThesisOrigami:→
      The Crane.QT", the rect of cd btn "craneDemo", fastidle
    put the result into movieID
  else
    play "click"
    set the ink of me to "srcOr"
    QTMovie direct, movieID, dispose
    lock screen
    show cd grc "Cover"
    unlock screen with visual bam door close very slow
    playmovie "The Crane",movienoclear, moviebkcolor,→
      movieloop,movienoupdate
  end if
end mouseup
```

card graphic "play" of card "ZooDemo"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global movieID
  play "click"
  set the ink of me to "srcOr"
  if movieID is not empty then
    QTMovie direct, movieID, set, rate, 1
    QTMovie direct, movieID, play
  end if
end mouseup
```

card graphic "stop" of card "ZooDemo"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global movieID
  play "click"
  set the ink of me to "srcOr"
  if movieID is not empty then
    QTMovie direct, movieID, set, rate, 1
    QTMovie direct, movieID, play
  end if
end mouseup
```



card graphic "stepForward" of card "ZooDemo"

```
on mousestilldown
  global movieID
  set the ink of me to "blend"
  if movieID is not empty then
    QTMovie direct, movieID, stepfwd
  end if
end mousestilldown
on mouseup
  set the ink of me to "srcOr"
end mouseup
```

card graphic "stepBackward" of card "ZooDemo"

```
on mousestilldown
  global movieID
  set the ink of me to "blend"
  if movieID is not empty then
    QTMovie direct, movieID, steprev
  end if
end mousestilldown
on mouseup
  set the ink of me to "srcOr"
end mouseup
```



• Project “JoinOrigami”

card graphic “help” of card “JoinIntro”

```
on mousedown
  lock screen
  if the ink of cd grc "annualBtn" is "blend" or the ink of cd grc "
    "privilegeBtn" is "blend" then
    set the ink of cd grc "annualBtn" to "srcOr"
    hide cd grc "annualFee"
    hide cd grc "annualDone"
    set the ink of cd grc "privilegeBtn" to "srcOr"
    hide cd grc "privilege"
    hide cd grc "privilegeDone"
  end if
  unlock screen with visual venetian blinds
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  lock screen
  show cd grc "helpDone"
  show cd grc "helpIntro"
  unlock screen with visual wipe left slow
end mouseup
```

card graphic “annualBtn” of card “JoinIntro”

```
on mouseup
  if the ink of cd grc "privilegeBtn" is "blend" then
    set the ink of cd grc "privilegeBtn" to "srcOr"
    lock screen
    hide cd grc "privilege"
    hide cd grc "privilegeDone"
    unlock screen with visual venetian blinds
  end if
  if the ink of me is "srcOr" then
    play "click"
    set the ink of me to "blend"
    lock screen
    show cd grc "annualFee"
    show cd grc "annualDone"
    unlock screen with visual venetian blinds
  else
    play "click"
    set the ink of me to "srcOr"
    lock screen
    hide cd grc "annualFee"
    hide cd grc "annualDone"
    unlock screen with visual venetian blinds
  end if
end mouseup
```



```

card graphic "menu" of card "JoinIntro"
on mousedown
  lock screen
  if the ink of cd grc "annualBtn" is "blend" then
    set the ink of cd grc "annualBtn" to "srcOr"
    hide cd grc "annualFee"
    hide cd grc "annualDone"
  end if
  if the ink of cd grc "privilegeBtn" is "blend" then
    set the ink of cd grc "privilegeBtn" to "srcOr"
    hide cd grc "privilege"
    hide cd grc "privilegeDone"
  end if
  unlock screen with visual venetian blinds
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  answer "This will take you to Origami's Main Menu !" with "cancel" or—
  "O.K." at 362,240
  if it is "O.K." then
    set the ink of me to "srcOr"
    visual iris close slow
    go to cd "Origami" of window "Origami" of project "Origami"
  else
    set the ink of me to "srcOr"
    exit mouseup
  end if
end mouseup

```

```

card graphic "memberBtn" of card "JoinIntro"
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  if the ink of cd grc "privilegeBtn" is "blend" then
    set the ink of cd grc "privilegeBtn" to "srcOr"
    lock screen
    hide cd grc "privilege"
    hide cd grc "privilegeDone"
    unlock screen with visual venetian blinds
    wait 10
  end if
  if the ink of cd grc "annualBtn" is "blend" then
    set the ink of cd grc "annualBtn" to "srcOr"
    lock screen
    hide cd grc "annualFee"
    hide cd grc "annualDone"
    unlock screen with visual venetian blinds
    wait 10
  end if
end mouseup

```



```
end if
  play "click"
  set the ink of me to "srcOr"
  set the cursor to none
  playmovie "The Center",movienodialogue,movienoclear,
    moviebkcolor
  visual iris open slow
  go to cd "MemberEntry"
  set the cursor to hand
end mouseup
```

card graphic "newMember" of card "MemberEntry"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  visual venetian blinds
  go to cd "NewMember"
end mouseup
```

card graphic "oldMember" of card "MemberEntry"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  visual wipe right slow
  go to cd "OldMember"
end mouseup
```

card "NewMember"

```
on opencard
  global nameHello
  lock screen
  hide cd grc "creditCard"
  hide cd fld "cardNumber"
  hide cd fld "expireDate"
  hide cd grc "amex"
  hide cd grc "visa"
  hide cd grc "master"
  put empty into cd fld "fee"
  put empty into cd fld "name"
  put empty into cd fld "address"
  put empty into cd fld "phone"
  put empty into cd fld "cardNumber"
  put empty into cd fld "expireDate"
  set the hilite of cd btn "jun" to false
```



```
set the hilite of cd btn "reg" to false
set the hilite of cd btn "fam" to false
set the hilite of cd btn "ove" to false
set the hilite of cd btn "bill" to false
set the hilite of cd btn "credit" to false
set the ink of cd grc "amex" to "srcOr"
set the ink of cd grc "visa" to "srcOr"
set the ink of cd grc "master" to "srcOr"
unlock screen
select before line 1 of cd fld "name"
end opencard
```

card button "jun" of card "NewMember"

```
on mouseUp
  if cd fld "name" is empty or cd fld "address" is empty then
    beep
    answer "Please complete your personal data." with "O.K."
  else
    play "click"
    set the hilite of me to true
    set the hilite of cd btn "reg" to false
    set the hilite of cd btn "fam" to false
    set the hilite of cd btn "ove" to false
    put "$15" into cd fld "fee"
  end if
end mouseUp
```

card button "bill" of card "NewMember"

```
on mouseUp
  if cd fld "fee" is empty then
    beep
    answer "Please select Type of Membership." at 362,240
  else
    play "click"
    set the hilite of me to true
    set the hilite of cd btn "credit" to false
    lock screen
    hide cd grc "creditCard"
    hide cd fld "cardNumber"
    hide cd fld "expireDate"
    hide cd grc "amex"
    hide cd grc "visa"
    hide cd grc "master"
    unlock screen with visual wipe right slow
  end if
end mouseUp
```

card button "credit" of card "NewMember"

```
on mouseUp
  if cd fld "fee" is empty then
```



```

beep
  answer "Please select Type of Membership." at 362,240
else
  play "click"
  set the hilite of me to true
  set the hilite of cd btn "bill" to false
  lock screen
  show cd grc "creditCard"
  show cd fld "cardNumber"
  show cd fld "expireDate"
  show cd grc "amex"
  show cd grc "visa"
  show cd grc "master"
  unlock screen with visual wipe left slow
end if
end mouseUp

```

card graphic "amex" of card "NewMember"

```

on mouseup
  play "click"
  set the ink of me to "blend"
  set the ink of cd grc "visa" to "srcOr"
  set the ink of cd grc "master" to "srcOr"
  select before line 1 of cd fld "cardNumber"
end mouseup

```

card graphic "done" of card "NewMember"

```

on mouseup
  global nameHello
  if cd fld "name" is empty or cd fld "address" is empty then
    beep
    answer "Please complete the registration form!" with "O.K."
  else
    if the hilite of cd btn "bill" is false and the hilite of cd btn "credit" is false then
      beep
      answer "Please complete the registration form!" with "O.K."
    else
      if the hilite of cd btn "credit" is true then
        if cd fld "cardNumber" is empty or cd fld "expireDate" is empty then
          then
            beep
            answer "Please complete the credit-card info." with "O.K."
          else
            memberDone
          end if
        else
          memberDone
        end if
      end if
    end if
  end if
end mouseup

```



```

end if
end mouseup
on memberDone
  global nameHello
  play "click"
  put line 1 of cd fld "name"&return into nameHello
  put nameHello after cd fld "memberList" of cd "memberList"
  set the ink of me to "blend"
  wait 5
  set the ink of me to "srcOr"
  if the hilite of cd btn "credit" is true then
    lock screen
    set the ink of cd grc "amex" to "srcOr"
    set the ink of cd grc "visa" to "srcOr"
    set the ink of cd grc "master" to "srcOr"
    hide cd grc "creditCard"
    hide cd fld "cardNumber"
    hide cd fld "expireDate"
    hide cd grc "amex"
    hide cd grc "visa"
    hide cd grc "master"
    put empty into cd fld "cardNumber"
    put empty into cd fld "expireDate"
    unlock screen with visual wipe right slow
  end if
  visual iris open slow
  go to cd "MemberSection"
end memberDone

```

card graphic "cancel" of card "NewMember"

```

on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  if the hilite of cd btn "credit" is true then
    lock screen
    set the ink of cd grc "amex" to "srcOr"
    set the ink of cd grc "visa" to "srcOr"
    set the ink of cd grc "master" to "srcOr"
    hide cd grc "creditCard"
    hide cd fld "cardNumber"
    hide cd fld "expireDate"
    hide cd grc "amex"
    hide cd grc "visa"
    hide cd grc "master"
    put empty into cd fld "cardNumber"
    put empty into cd fld "expireDate"
    unlock screen with visual wipe right slow
  end if
end mouseup

```



```
end if
visual venetian blinds
go to cd "MemberEntry"
end mouseup
```

```
card "OldMember"
on opencard
global nameHello
select before line 1 of cd fld "nameEnter"
end opencard
on closecard
put empty into cd fld "nameEnter"
end closecard
```

```
card graphic "enter" of card "OldMember"
on mousedown
set the ink of me to "blend"
end mousedown
on mouseup
global nameHello
if cd fld "nameEnter" is empty then
beep
answer "Please enter your name." with "O.K." at 362,240
set the ink of me to "srcOr"
else
play "click"
set the ink of me to "srcOr"
set cursor to none
playmovie "The OtherCenter", movienodialogue, movienoclear, ↵
moviebkcolor
set cursor to hand
if cd fld "memberList" of cd "memberList" contains line 1 of cd fld ↵
"nameEnter" then
put line 1 of cd fld "nameEnter" into nameHello
visual iris open slow
go to cd "MemberSection"
else
beep
answer "Sorry! You are not the member." with "cancel" or "Enter ↵
me!" at 362,240
if it is "cancel" then
put empty into cd fld "nameEnter"
exit mouseup
else
put cd fld "nameEnter" into nameHello
visual wipe left slow
go to cd "NewMember"
end if
end if
end if
end mouseup
```



card "MemberSection"

```
on opencard
  global nameHello, getMail
  put true into getMail
  put nameHello into cd fld "nameHello"
end opencard
```

card graphic "books & supplies" of cd "MemberSection"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  visual iris open slow
  go to cd "Books"
end mouseup
```

card graphic "return" of card "MemberSection"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  answer "Are you sure to exit the member section?" with "Yes" or "No" at 362,240
  if it is "Yes" then
    put empty into cd fld "nameHello"
    set the ink of me to "srcOr"
    visual iris close slow
    go to cd "JoinIntro"
  else
    set the ink of me to "srcOr"
    exit mouseup
  end if
end mouseup
```

card graphic "searchAuthor" of card "Books"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "vibes"
  global nameHello, C
  set the ink of me to "srcOr"
  set cursor to watch
  lock screen
  put empty into C
  put empty into cd fld "booksList" of cd "BooksList"
  go cd 1 of window "Join2"
```



```
sort by field "Author"
put field "Author" into A
put A & return into B
put short id of this card & return into C
repeat number of cards - 1
  go next
  if A is field "Author" then
    put short id of this card & return after C
  else
    put field "Author" & return after B
    put field "Author" into A
    put "," & short id of this card & return after C
  end if
end repeat
go to cd "BooksList" of window "Join1"
put B into cd fld "booksList"
unlock screen with visual venetian blinds
put C into cd fld "idList"
end mouseup
```

```
card graphic "browseAll" of card "Books"
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global wholestack
  play "vibes"
  set the ink of me to "srcOr"
  put true into wholestack
  visual zoom open slow
  go to cd id 101 of window "join2"
  show bg grc "backArrow2"
end mouseup
```

```
card field "bookslst" of card "BooksList"
on clicklist
  global C, thelist, index, wholestack
  get the hilitedlines of me
  put it into X
  put item X of C into thelist
  put 1 into index
  put false into wholestack
  put last word of line index of thelist into D
  visual zoom open slow
  go to cd id D of window "Join2"
  hide bg grc "backArrow2"
end clicklist
```



card button "marked" of card "Book1"

```
on mouseup
  if the hilite of me is false then
    play "click"
    set the hilite of me to true
    put "yes" into cd fld "check"
    select before line 1 of bg fld "qty"
  else
    play "click"
    set the hilite of me to false
    put "no" into cd fld "check"
    put empty into bg fld "qty"
  end if
end mouseup
```

background graphic "next" of card "Book1"

```
on mousedown
  set the ink of me to "notsrcXor"
end mousedown
on mouseup
  global index, thelist, wholestack, M, N
  set the ink of me to "srcOr"
  play "click"
  if wholestack is true then
    visual wipe right slow
    go to next card
    add 1 to N
    if N >= M then
      visual wipe right slow
      go to cd id 103 of window "Join3"
    end if
  else
    if index >= number of lines in thelist then
      beep
      answer "There are no more items to the right" with "O.K."
    else
      add 1 to index
      put last word of line index of thelist into X
      play "Splat"
      visual wipe right slow
      go to cd id X
    end if
  end if
end mouseup
```

background graphic "prev" of card "Book1"

```
on mousedown
  set the ink of me to "notsrcXor"
end mousedown
on mouseup
```



```

global index, thelist, wholestack, M, N
set the ink of me to "srcOr"
play "click"
if wholestack is true then
  visual wipe left slow
  go to prev card
  subtract 1 from M
  if M<1 then
    visual wipe left slow
    go to cd id 113 of window "Join3" of project "JoinOrigami"
  end if
else
  if index <=1 then
    beep
    answer "There are no more items to the left" with "O.K."
  else
    subtract 1 from index
    put last word of line index of thelist into X
    play "Splat"
    visual wipe left slow
    go to cd id X
  end if
end if
end mouseup

```

```

background graphic "viewOrder" of card "Book1"
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global list1,list2,list3,list4,list5
  play "click"
  set the ink of me to "srcOr"
  set the cursor to watch
  put empty into list1
  put empty into list2
  put empty into list3
  put empty into list4
  put empty into list5
  put 0 into A
  push this card
  lock screen
  repeat number of cards
    go next
    if line 1 of cd fld "check" is "yes" then
      add 1 to A
      put A & return after list1
      put char 1 to 17 of line 1 of bg fld "Title" & return after list2
      if bg fld "qty" is empty then
        put 1 into X

```



```

else
  put line 1 of bg fld "qty" into X
end if
put X & return after list3
put word 2 of line 1 of bg fld "Price" into Y
put Y & return after list4
put X*Y into Z
put Z & return after list5
end if
end repeat
unlock screen
pop card
push this card
visual venetian blinds
go to cd "BookOrder" of window "Join1"
set the cursor to hand
end mouseup

```

card "BookOrder"

```

on opencard
  global nameHello, list1, list2, list3, list4, list5
  lock screen
  set hilite of cd btn "bill" to false
  set hilite of cd btn "credit" to false
  hide cd grc "payment"
  hide cd btn "bill"
  hide cd btn "credit"
  unlock screen
  put nameHello into cd fld "accountName"
  put list1 into cd fld "list 1"
  put list2 into cd fld "list 2"
  put list3 into cd fld "list 3"
  put list4 into cd fld "list 4"
  put list5 into cd fld "list 5"
  put line 1 of cd fld "list 5" into X
  repeat with N=2 to number of lines in cd fld "list 5"
    put line N of cd fld "list 5" into Y
    put X+Y into X
  end repeat
  put X into cd fld "subTotal"
  put X*20/100 into Z
  put Z into cd fld "discount"
  put X-Z into Q
  put Q into cd fld "total"
end opencard

```

card graphic "order" of card "BookOrder"

```

on mousedown
  set the ink of me to "blend"
end mousedown

```



```

on mouseup
  if cd fld "total" = 0 or cd fld "total" is empty then
    beep
    answer "You didn't select any books or supplies!" with "cancel"
  set the ink of me to "srcOr"
  else
    play "click"
    set the ink of me to "srcOr"
    lock screen
    show cd grc "payment"
    show cd btn "bill"
    show cd btn "credit"
    unlock screen with visual wipe right slow
  end if
end mouseup

```

card graphic "go back" of card "BookOrder"

```

on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  set the ink of me to "srcOr"
  if the hilite of cd btn "bill" is true or the hilite of cd btn "credit" is true
  then
    beep
    answer "Please cancel your order first." with "O.K."
  else
    lock screen
    put empty into cd fld "list 1"
    put empty into cd fld "list 2"
    put empty into cd fld "list 3"
    put empty into cd fld "list 4"
    put empty into cd fld "list 5"
    put empty into cd fld "subTotal"
    put empty into cd fld "discount"
    put empty into cd fld "total"
    pop card
    unlock screen with visual venetian blinds
  end if
end mouseup

```

card graphic "done" of card "BookOrder"

```

on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global nameHello
  set the ink of me to "srcOr"
  if the hilite of cd btn "credit" is true then

```



```

if cd fld "cardNumber" is empty or cd fld "expireDate" is empty then
  answer "Please complete the credit-card form." with "O.K."
else
  orderDone
  lock screen
  set the ink of cd grc "amex" to "srcOr"
  set the ink of cd grc "visa" to "srcOr"
  set the ink of cd grc "master" to "srcOr"
  hide cd grc "creditCard"
  hide cd fld "cardNumber"
  hide cd fld "expireDate"
  hide cd grc "amex"
  hide cd grc "visa"
  hide cd grc "master"
  unlock screen with visual wipe right slow
end if
else
  orderDone
end if
set cursor to watch
lock screen
hide cd grc "orderDone"
hide cd grc "orderCancel"
hide cd grc "done&cancel"
unlock screen with visual dissolve
lock screen
go to cd 1 of window "Join2"
repeat number of cards
  go next
  if the hilite of cd btn "marked" is true then
    set the hilite of cd btn "marked" to false
    put empty into bg fld "qty"
    put "no" into cd fld "check"
  end if
end repeat
go to cd 1 of window "Join3"
repeat number of cards
  go next
  if the hilite of cd btn "marked" is true then
    set the hilite of cd btn "marked" to false
    put empty into bg fld "qty"
    put "no" into cd fld "check"
  end if
end repeat
go to cd "BookOrder" of window "join1"
unlock screen
visual iris close slow
go to cd "MemberSection"
set cursor to hand
end mouseup

```



```
on orderDone
  dial "(716) 475-2916"
  wait 50
  answer "Your order'll be shipped to you within 3 days!" with "O.K."
end orderDone
```

card graphic "cancel" of card "BookOrder"

```
on mouseup
  set the ink of me to "srcOr"
  if the hilite of cd btn "credit" is true then
    lock screen
    set the ink of cd grc "amex" to "srcOr"
    set the ink of cd grc "visa" to "srcOr"
    set the ink of cd grc "master" to "srcOr"
    hide cd grc "creditCard"
    hide cd fld "cardNumber"
    hide cd fld "expireDate"
    hide cd grc "amex"
    hide cd grc "visa"
    hide cd grc "master"
    unlock screen with visual wipe right slow
  end if
  lock screen
  set the hilite of cd btn "bill" to false
  set the hilite of cd btn "credit" to false
  hide cd btn "bill"
  hide cd btn "credit"
  hide cd grc "payment"
  unlock screen with visual wipe left slow
  lock screen
  hide cd grc "orderDone"
  hide cd grc "orderCancel"
  hide cd grc "done&cancel"
  unlock screen with visual dissolve
end mouseup
```

card graphic "bill" of card "BookOrder"

```
on mouseUp
  set the hilite of me to true
  play "click"
  set the hilite of cd btn "credit" to false
  set cursor to none
  lock screen
  show cd grc "done&cancel"
  show cd grc "orderDone"
  show cd grc "orderCancel"
  unlock screen with visual dissolve
  lock screen
  hide cd grc "creditCard"
  hide cd fld "cardNumber"
```



```
hide cd fld "expireDate"
hide cd grc "amex"
hide cd grc "visa"
hide cd grc "master"
unlock screen with visual wipe right slow
set cursor to hand
end mouseUp
```

card graphic "credit" of card "BookOrder"

```
on mouseUp
  set the hilite of me to true
  play "click"
  set the hilite of cd btn "bill" to false
  set cursor to none
  lock screen
  put empty into cd fld "cardNumber"
  put empty into cd fld "expireDate"
  show cd grc "creditCard"
  show cd fld "cardNumber"
  show cd fld "expireDate"
  show cd grc "amex"
  show cd grc "visa"
  show cd grc "master"
  unlock screen with visual wipe left slow
  lock screen
  show cd grc "done&cancel"
  show cd grc "orderDone"
  show cd grc "orderCancel"
  unlock screen with visual dissolve
  set cursor to hand
end mouseUp
```

card graphic "hotNews" of card "News"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "vibes"
  set the ink of me to "srcOr"
  visual iris open slow
  go to cd "HotNews1" of window "Join4"
end mouseup
```

card graphic "#124" of card "HotNews1"

```
on mouseup
  play "click"
  if the ink of cd grc "#125" is "notsrcXor" then
    set the ink of cd grc "#125" to "srcOr"
  end if
  if the ink of cd grc "#126" is "notsrcXor" then
```



```
set the ink of cd grc "#126" to "srcOr"
end if
if the ink of me is "srcOr" then
  set the ink of me to "notsrcXor"
else
  set the ink of me to "srcOr"
end if
end mouseup
```

card graphic "more info" of card "HotNews1"

```
on mouseup
  play "click"
  if the ink of me is "srcOr" then
    set the ink of me to "blend"
    if the ink of cd grc "#124" is "notsrcXor" then
      lock screen
      set the ink of cd grc "#124" to "srcOr"
      hide cd grc "#124"
      show cd grc "info"
      show cd grc "done"
      unlock screen with visual venetian blinds
    else
      if the ink of cd grc "#124" is "srcOr" and the ink of cd grc "#125" is "srcOr" and the ink of cd grc "#126" is "srcOr" then
        answer "Please select the news' number." with "O.K."
        set the ink of me to "srcOr"
      else
        answer "More information, call (716) 475-2916" with "O.K."
        if it is "O.K." then
          set the ink of cd grc "#125" to "srcOr"
          set the ink of cd grc "#126" to "srcOr"
          set the ink of me to "srcOr"
        end if
      end if
    end if
  end if
else
  set the ink of me to "srcOr"
  set the ink of cd grc "done" to "srcOr"
  lock screen
  hide cd grc "info"
  show cd grc "#124"
  hide cd grc "done"
  unlock screen with visual venetian blinds
end if
end mouseup
```

card graphic "reserve" of card "HotNews1"

```
on mouseup
  play "click"
  if the ink of me is "srcOr" then
```



```

set the ink of me to "blend"
if the ink of cd grc "#124" is "srcOr" and the ink of cd grc "#125" is
  "srcOr" and the ink of cd grc "#126" is "srcOr" then
  answer "Please select the news' number." with "O.K." at 364,243
  set the ink of me to "srcOr"
else
  dial "(716) 475-4231"
  get random (2)
  if it is 1 then
    lock screen
    set the ink of cd grc "#124" to "srcOr"
    set the ink of cd grc "#125" to "srcOr"
    set the ink of cd grc "#126" to "srcOr"
    hide cd grc "#124"
    hide cd grc "#125"
    hide cd grc "#126"
    show cd grc "thank"
    show cd grc "thankDone"
    show cd grc "thankCancel"
    unlock screen with visual venetian blinds
  else
    lock screen
    set the ink of cd grc "#124" to "srcOr"
    set the ink of cd grc "#125" to "srcOr"
    set the ink of cd grc "#126" to "srcOr"
    hide cd grc "#124"
    hide cd grc "#125"
    hide cd grc "#126"
    show cd grc "sorry"
    show cd grc "sorryDone"
    show cd grc "sorryList"
    unlock screen with visual venetian blinds
  end if
end if
else
  set the ink of me to "srcOr"
  set the ink of cd grc "#124" to "srcOr"
  set the ink of cd grc "#125" to "srcOr"
  set the ink of cd grc "#126" to "srcOr"
  lock screen
  hide cd grc "thank"
  hide cd grc "thankDone"
  hide cd grc "thankCancel"
  hide cd grc "sorry"
  hide cd grc "sorryDone"
  hide cd grc "sorryList"
  show cd grc "#124"
  show cd grc "#125"
  show cd grc "#126"
  unlock screen with visual venetian blinds
end if
end mouseup

```



card "ConnectSend"

```
on opencard
  global getMail
  if getMail is true then
    repeat 3 times
      play "Beep"
      set the ink of cd grc "get mail" to "blend"
      wait 38
      set the ink of cd grc "get mail" to "srcOr"
      wait 38
    end repeat
  end if
  select before line 1 of cd fld "mailName"
end opencard
```

card graphic "done" of card "ConnectSend"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  if cd fld "mailName" is empty then
    answer "Please enter the destination." with "O.K." at 356,234
  else
    if cd fld "mailMessage" is empty then
      answer "There is no message." with "O.K." at 356,234
    else
      dial "111,1111,11"
      answer "Send mail successful!" with "O.K." at 356,234
      put empty into cd fld "mailMessage"
      put empty into cd fld "mailName"
    end if
  end if
  set the ink of me to "srcOr"
end mouseup
```

card graphic "more" of card "ConnectSend"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "click"
  if cd fld "mailMessage" is not empty then
    answer "Please click on DONE first" with "O.K."
  else
    answer "Type your message and hit enter key." with "O.K."
  end if
  set the ink of me to "srcOr"
end mouseup
```



card graphic "cancel" of card "ConnectSend"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  play "syndrum"
  set the ink of me to "srcOr"
  put empty into cd fld "mailMessage"
  put empty into cd fld "mailName"
end mouseup
```

cd "ConnectGet"

```
on opencard
  hide cd fld "myMessage"
  put "Wilai Asawadechsakdi" into cd fld "getName"
  put cd fld "myMessage" into cd fld "getMessage"
end opencard
```

card graphic "done" of card "ConnectGet"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global getMail
  play "click"
  set the ink of me to "srcOr"
  put false into getMail
  visual wipe left slow
  go to card "ConnectSend"
end mouseup
```

card graphic "save" of card "ConnectGet"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global saveName, saveMessage
  play "click"
  ask "Please name your saved-message." at 356,234
  put it into saveName
  put cd fld getMessage into saveMessage
  set the ink of me to "srcOr"
end mouseup
```

card graphic "retrieve" of card "ConnectGet"

```
on mousedown
  set the ink of me to "blend"
end mousedown
on mouseup
  global saveName, saveMessage
```



```
play "click"  
ask "Which message you want to retrieve?" at 356,234  
if it is saveName then  
  put saveMessage into cd fld "getMessage"  
else  
  answer "File not found." with "O.K." at 356,234  
end if  
set the ink of me to "srcOr"  
end mouseup
```



• User Interface Design Principles

This section describes the fundamental principles of the Apple Desktop Interface. It's a brief reminder of the basic premises that you should consider when you design your application for the Macintosh computer.

Metaphors from the real world.

Concrete, simple metaphors provide people with a set of expectations to apply to computer environment. Whenever appropriate, audio and visual effects can support the metaphors.

Direct manipulation.

Each user action has a perceptible response and the Operating System provides feedback to verify the effect of the action. For example, icons move when users drag them. In the Macintosh interface, people don't have to trust that abstract commands entered in a text-based interface do what they promise. This means that when users choose the Bold command, a word changes immediately to boldface in comparison to other operating systems in which users type in commands and wait to see the results when the document is printed.

See-and-point (not remember-and-type).

Users rely on recognition, not recall, so entities are visible when possible. People don't have to remember anything the computer already knows, such as which commands are available.

Consistency.

Effective applications are internally consistent and consistent with other applications.

WYSIWYG (what you see is what you get).

There is no significant difference between what users see on the screen and what eventually is printed.

User control.

Users, not the computer or the application, initiate and control all actions.

Feedback and dialog.

Users get feedback about all interactions with the computer, and it is immediate feedback when possible. This communication should be brief, direct, and expressed in the users' vocabulary rather than the programmer's.

Forgiveness.

As users explore the interface, their actions should generally be reversible so that people explore and learn by doing. Users should be able to identify in advance any actions that aren't reversible.



Perceived stability.

Users feel comfortable in a computer environment that remains understandable and familiar rather than one that changes randomly.

Aesthetic integrity.

Visually confusing or unattractive displays detract from the effectiveness of human-computer interactions. Therefore different things, like folders and documents, should look different on the screen. Also, users should be able to control the superficial appearance of their computer workplaces to display their own style and individuality. Messes are only acceptable if users make them. Applications aren't allowed this freedom.

• General Color Design Guidelines

Always design for black and white first and then colorize that design. This method ensures that your design looks good on all Macintosh computers. One example of why this is important is the text selection mechanism. On a color monitor you might be tempted to change the color of text to indicate its selection; however, this technique wouldn't translate to a black-and-white monitor. In addition, a significant percentage of the population (up to 10 percent of the male population) has color deficiencies and wouldn't recognize the use of color to indicate selection. Therefore, you should never use color as the only means of communicating important information. Color should always be used redundantly.

Keep black-and-white designs two-dimensional. It's important to maintain the visual consistency of the Macintosh interface across applications and computer systems. Don't cause unnecessary visual clutter by trying to mimic color effects, such as shadow, in black-and-white designs.

Maintain a close visual relationship between a black-and-white design and its colorized version. Users should be able to easily recognize standard interface elements and icons across all monitor types. Users can have several monitors connected to a computer and several computers on which they use your applications. Your application should look consistent when a user changes the bit-depth of a monitor or when the user moves your icon or window from a color monitor to a monochrome monitor.

Use as few colors as possible in your designs. The few colors you use, the less flashing occurs when the screen's color table updates during screen redrawing. Using fewer colors also results in less visual clutter on the screen. If you use a graphics application to do design work, make sure that the colors you use are available in the default color tables.



Use light or subtle colors for large areas. Also use subtle colors to avoid visual clutter on the screen. To extend the range of light or subtle colors available, you can create colors that are lighter than those in the default color tables by using a 50 percent pattern of the color and white.

Use bright colors sparingly and only in small areas. Bright colors attract the eye and can distract the user from the information that you're trying to convey. Bright colors can be effective in the contents of a window, such as in a chart. However, if bright colors appear all over the screen, it becomes difficult for the user to focus attention. Use a consistent light source. On the Macintosh screen the light source always comes from the upper-left corner of the screen. Therefore windows and other elements have drop shadows on the lower-right side. Use the light source consistently, so that shading is consistent throughout the interface.

• Dialog Boxes

Button labels

Whenever possible, label a button with a verb that describes the action that it performs. Use book-title capitalization for button labels. In general, this means that you capitalize one-word titles and, in multiple-word titles, capitalize words of four or more letters. Usually you don't capitalize words like *in*, *an*, or *and*.

Provide a Cancel button whenever you can, and always map Command-period and the Esc (Escape) key to the Cancel button. Map the Return key and the Enter key to the default button, which is usually the button with the safest result or the most likely response.

In all dialog boxes, any buttons that are activated by key sequences must invert to give visual feedback that indicates which item has been chosen. A good rule of thumb is to invert the button for 8 ticks of the clock, which is long enough to be visible, but short enough that it's not annoying. All alert boxes and modal dialog boxes that use the ModalDialog procedure exhibit this behavior. If you implement your own dialog boxes or alert boxes, be sure to include this behavior.

A user typically reads the text in a dialog box until it becomes familiar and then relies on visual cues, such as button names or positions, to respond. Names such as Save, Quit, or Erase Disk allow users to identify and click the correct button quickly. These words are often more clear and precise than words like OK, Yes, and No. If the action can't be condensed into a word or two, OK and Cancel or Yes and No may serve the purpose. If you use these generic words, be sure to phrase the wording in the dialog box so that the action the button initiates is clear.



Use Cancel for the button that closes the alert or dialog box and returns the computer to the state it was in before the alert or dialog box appeared. Cancel means “dismiss this operation, with no side effects.” It does not mean “I’ve read this dialog box” or “stop what you’re doing regardless.”

When it is impossible to return to the state that existed before an operation began, don’t use the word Cancel. You can use OK or Stop, which are useful in different situations. Use OK for the name of a button that closes the alert or dialog box and accepts any changes made while the dialog box was displayed.

If there is a most likely action, use a default button. This button usually completes the action that the user initiated to bring up the dialog box. The default button is outlined with an additional border of three black pixels, separated by a border of one white pixel, and its action is performed when the user clicks the button or presses the Return or Enter Key.

Don’t use a default button if the most likely action is dangerous—for example, if it causes a loss of user data. When there is no default button, pressing Return or Enter has no effect; the user must explicitly click a button. This guideline protects users from accidentally damaging their work by pressing Return or Enter out of habit. You can consider using a safe default button, such as Cancel.

A modal dialog box usually cuts the user off from the task. That is, he or she can’t see the area of the document that changes when choices are made in the dialog box until dismissing the dialog box. Once the area becomes visible by dismissing the dialog box, the user sees whether the changes are the desired one. If the changes aren’t appropriate, then the user has to repeat the entire operation. To provide the better feedback to the user, you need to provide a way for the user to see what the changes will be. Therefore, any selection made in a modal dialog box should immediately update the document contents, or you should provide a sample area in the dialog box that reflects the changes that the user’s choices will make. In the case of immediate document updating, the OK button means “accept this change” and the Cancel button means “undo all changes done by this dialog box.”

Some applications use an Apply button to approximate this behavior. This method confuses the meaning of OK and Cancel and is not recommended. If you must implement modal dialog boxes with an Apply button, you need to include a Cancel button and a Revert button in the dialog box. Otherwise the Cancel button becomes confusing to the user. When there is an apply button, the Cancel button undoes the results of the Apply operation and dismisses the dialog box. The OK button dismisses the dialog box. The Revert button returns the document to the state it was in before the dialog box was displayed.



The user must always be able to undo any actions caused by the dialog box.

Dialog box messages.

Write messages in dialog boxes and alert boxes that make sense to the user. Use simple, nontechnical language and don't provide system-oriented information that the user can't respond to. When possible, give the user information that helps explain how to correct the problem.



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