MUSEUM OF FORMOSAN ABORIGINES

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MUSEUM OF FORMOSAN ABORIGINES

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PREFACE

ABOUT THE TITLE

In the beginning, the purpose of this thesis was to explore the feasibility of creating a computer-based visual museum. I wanted to experiment with 3-D interactivity, such as how to set up the cursor movement in a 3-D world and how to use 3-D animation in interactive multimedia. I wanted to use Native Americans as the subject of this 3-D museum project.

After I sent my thesis proposal to our department, I found my classmate's project was about Native Americans also. Therefore, I decided on another topic.

In July 1995, I went back to Taiwan to visit my friends. I found that Sinorama magazine had a series of articles discussing Taiwan's indigenous culture. By this chance, I reviewed their culture from hunting to battle, agriculture to fishing; from weddings to funerals, worship to exorcism, prayers for good harvests to harvest celebrations; from legends to stories, myths to ethnic-origin tales, concepts of nature to the view of the world. Their culture was so exciting to me. I started to think about changing the subject of my thesis. I discussed the idea with my friends. All of them encouraged me to do this project and also helped me to do research.

This thesis still focuses on the 3-D museum, which attempts to preserve the tribes' rich past and present it in an intuitive way. Interactive media is used to maintain the audience's attention while introducing them to a foreign society. The interactive program was created using numerous computer software packages, combined together to comprise the heart of the thesis. The program has been built around Macromind Director, Video Fusion™, Strata StudioPro™, Adobe Premiere™, Adobe Photoshop™ and SoundEdit™16. The combination of all these programs results in the end product: an interactive program.

ABOUT THE AUTHOR

It is difficult today to find design offices or art and design educational institutes that do not use computer systems to create their art work. Before I came to America, I studied Commercial Design in high school, Western Painting in an art academy and Applied Art as an undergraduate. When working in the university as a teaching assistant, I found that the nature of the design task was changing. Designers have used computers to amplify their professional skills, and to carry out conventional tasks more quickly and effectively. To them, the computer is a part of everyday life.

I also found that books, films, music and animation could only be experienced in isolation. This fragmentation is very unlike our experience of everyday life. I wanted to pursue a method of combining all of the information together. That is why I came here to study Computer Graphics Design.

The Computer Graphics Design department focuses on Multimedia. For practical purposes, Multimedia may be defined as the combining of two-dimensional graphics, three-dimensional graphics, sound, scanned images, text, film, animation and video in an interactive way. Multimedia allows one to look up various pieces of information which are interconnected using key words or icons as electronic footnotes. This directs the reader to related points, associated topics and areas for further research. Users can quickly browse through large volumes of information to find the material which is important to them. Because it would allow the interactive media to be "composed" into a form that has meaning and value for the user, the user becomes the composer.

For me, interactive multimedia is a technology which provides great challenges and opportunities. I find this to be quite interesting as it requires the combination of various media such as audio, video, text and still images. I can use multimedia to achieve a unique combination of my traditional skills with new media.

THE FORMOSAN ABORIGINES

The main purpose of this thesis is to introduce nine Formosan (Taiwanese) aboriginal tribes while exploring the use of an interactive visual museum.

TAIWAN

Taiwan (also known as Formosa), is a pea pod-shaped island, 90 miles at the widest part and 230 miles long, situated in the China Sea. Its closest neighbor is mainland China. The Philippine Islands are also nearby, with Korea and Japan farther to the north.

Within the island the Snow Mountain and Central Mountain ranges separate the east and west. The rivers and valleys on both sides of the mountains drain into the Pacific Ocean. These are the geographic features that kept the early tribes isolated.

The climate is subtropical, only on the high mountain peaks may be found snow and ice. Vegetation covers the whole island, from the lowlands to the mountains. There are fresh and salt water fish near the seashore, and various animals in the mountain regions. These rich natural food resources were undoubtedly important to the survival of early indigenous tribes and also to successful occupation by invaders.

The geography of Taiwan may be the most significant factor in the continued isolation of its indigenous peoples. The mountain people live in different groups. Each group occupies a given territory and has its own leader. Taiwan is a rich territory, having grain in the land, fish in the water, and minerals such as copper and iron in the mountains.

THE NINE TRIBES OF TAIWAN

There are now nine groups of aborigines inhabiting Taiwan, eight in the mountain regions and one on the little island of Lan Yu. They are Atayal, Saisiat, Bunun, Tsou, Paiwan, Rukai, Puyuma, Ami, and Yami. Classification of these nine tribes are based on cultural differences such as language, living and marriage customs, etc.

YAMI

The Yami live on Orchid Island, or Lan Yu, a small island lying to the east in the Pacific Ocean. Evidence shows that the Yami reached Orchid Island less than a thousand years ago.

Fishing is central to the Yami economy and is supplemented by farming. Men are responsible for building and fishing, and the women for farming. The Yami kinship system is basically patrilineal although they also observe matrilineal kinship rules in matters like marriage taboos and revenge. The prototypical Yami dwelling consists of a main house, a working house, and a resting platform. Pottery making is an outstanding feature of Yami culture. The first launching of a newly completed boat and the Flying Fish festival in the spring are the Yami's most important celebrations.

According to Japanese investigators, the Yami language is similar to that of Bataan natives north of the Philippine Islands.

PAIWAN

The Paiwans inhabit the southernmost region of the Central Mountains, populating densely around Tawu Mountain. This mountain separates the two main branches of the Paiwan; the Raval and Butaul. More than 50 percent of the people live at an altitude between 1500 and 3000 feet.

They live primarily by farming, and are also involved in hunting, animal husbandry, and creek fishing. The Paiwan are noted for their wood and stone sculpture. The Butaul branch holds a major sacrificial rite every five years, called Marubuk, to invite the spirits of their dead ancestors to come and bless the living.

BUNUN

The Bunun live in the mountainous regions of central Taiwan. Approximately 70 percent of the people live at an altitude between 4000 and 7000 feet. This group's average altitude is the highest among the tribes. The center of the population is considered to be north of Yu

Mountain. They are lineal patriarchal, have strong family ties, and have the habit of pulling some of their upper teeth as a sign of social identity as well as maturity. The Bunun are gifted singers and often sing when working. Their harmonic skills are advanced and elegant, and they impressed the world with their "Praying for Rich Millet Harvest Song".

ATAYAL

The Atayal tribe inhabits the northern mountain regions. About half of them live at an altitude of 3000 to 4500 feet above sea level.

The Atayal are distributed over a large area in northern Taiwan. Their language is divided into the Atayal and Sediq branches and is not closely related to any other aborigine language.

Atayal men are good hunters, and Atayal women good weavers. In the past, facial tattooing among men and women, for beauty and distinction as well as the warding off of evil spirits, was a feature of this tribe. This practice is now outlawed and only those Atayals over 80 years old still have tattoos on their faces.

The Atayal kinship system is patrilineal. Leaders of several religious groups in a community usually constitute the political authority. The prototypical Atayal house is built at ground level, and is made of wood and thatch. There is a watch tower for each group of houses.

RUKAI

The Rukai live in the southern part of the central mountain range. Their neighbors are the Bununs and Tsous to the north, and the Paiwans to the south. As in certain other tribes, some families of the Rukais crossed the Central Mountains and settled permanently on the east side, becoming neighbors of the Puyumas.

Their economic activities, social strata, and kinship are similar to those of the Paiwan. Rukai houses are built of wood, bamboo, and thatch as well as stone slab. Some houses, including the roof, are built entirely of stone slabs. Rukai women are good cloth and basket

weavers, and Rukai men are gifted wood carvers. Master wood carvers are highly respected in the tribe. The lily is comparable to the laurel worn by the heroes of ancient Greece; only very brave warriors and very chaste women, after being recognized by the chief, have the right to wear it.

PUYUMA

The Puyuma are the east-coast inhabitants of Taiwan. The Puyuma, a small, rather civilized tribe, live together with native Chinese in many villages around the city of Ping Tung.

The Puyuma live in the small Tai Tung plain and surrounding hills in southeastern Taiwan. They are an agricultural people, supplementing their harvest with fishing and hunting. The Puyuma kinship system is ambilineal; while family inheritance goes to the eldest daughter, men and women share in kinship equally. The village is an independent political unit in Puyuma society, and feuding is common among villages. Young men's houses are centers for education, warrior training, and religious ceremonies. Teenage Puyuma boys used to receive spartan education at the men's house five months a year. The men's house also serves as the house of spirits, or Karumaan. Each clan has its own Karumaan.

AMI

The Ami tribe lives on a long narrow strip of land on the east coast north of the Puyuma territory.

The Ami, the largest of all of Taiwan's aborigine tribes--are mainly plains dwellers, living in the valleys and coastal plains of eastern Taiwan. The Ami are divided into five groups based on geography, custom, and language.

The Ami began to use oxen in cultivating paddies relatively early. Fishing is an important part of their economy, but hunting is now solely recreational. In Ami society, kinship is matrilineal, but men's clubs are well organized. The Ami are the only aboriginal tribe on the island of Taiwan to practice the art of pottery making.

The Ami harvest festivals have evolved from warrior training. Nowadays sports, symbolic fishing in the open seas, and singing and dancing are observed throughout the villages in a series of celebrations in July and August.

SAISIAT

In close physical contact to the Atayal on the west is the small Saisiat tribe, which inhabits the mountainsides at a relatively lower altitude. Since the Saisiats are bordered on the east by the Atayal and on the west by the native Chinese, they face territorial threats from the Atayal and a cultural threat from both sides.

The Saisiat are the smallest of Taiwan's aboriginal tribes in terms of population and area. They are surrounded and strongly influenced by the Atayal, and were the first among the tribes to be acculturated by the Han Chinese and adopt Chinese names. Like that of the Atayal, tattooing was also a feature of the Saisiat.

The Saisiat are noted for a unique festival of theirs: the Ceremony of the Pygmies--Pas-ta'ai. The legend has it that a group of pygmies once taught the Saisiat to farm, sing, and dance, but also harassed and raped the Saisiat women. The Saisiat entrapped and massacred all the pygmies but two. As the two survivors were escaping to the east, they cursed the Saisiat. To appease the souls of the pygmies, the Pas-ta'ai is held once every two years at the tenth full moon of the lunar calendar, and a grand pas-ta'ai takes place once every 10 years. Like the Greeks observing Olympia, the Saisiat forsake fights and quarrels during the Pas-ta'ai.

TSOU

The Tsou live west of Yu Mountain. Like the Atayals and Bununs they are mountain settlers. More than half of the tribe lives at altitudes ranging from 3000 to 4500 feet. There has possibly been both cultural and genetic infiltration from the neighboring people; Bunun in the north, Paiwan in the south, and Ping Pu in the west.

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The Tsou live on the west side of the middle section of the central mountain range. The "Northern Tsou" and "Southern Tsou" are distinct in language and custom. In the past two centuries, the Tsou's population has decreased dramatically due to the expansion of surrounding ethnic groups and also to various epidemics.

The typical Tsou house has rounded corners and a dome-shaped thatched roof which extends almost to the mud floor. The men's meeting huts, or kuba, serve as religious, political, and masculinity training centers. Enemy heads and a box of implements for igniting fires are kept there; women are not allowed in a kuba. The past significance of hunting among the Tsou is evident in their extensive use of leather in clothing.

——Saisiat

——Atayal

——Ami

——Tsou
——Bunun

——Rukai
——Puyuma

——Paiwan

——Yami
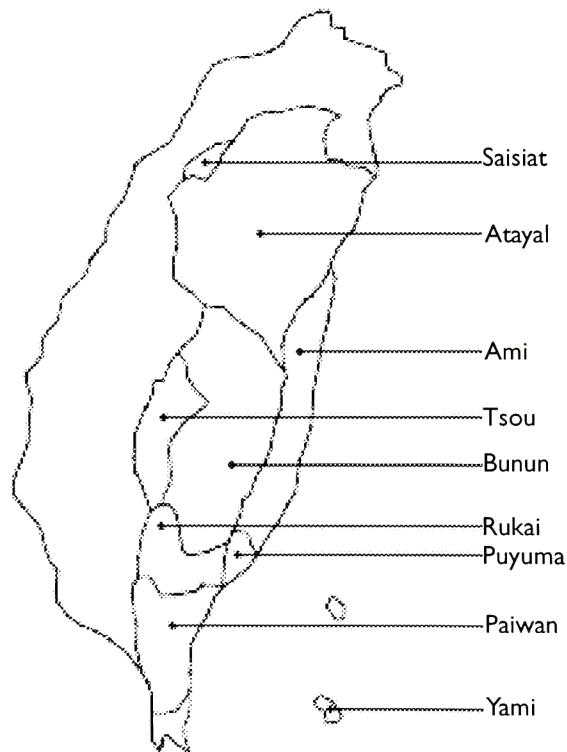
THESIS DESCRIPTION

THESIS PLANNING

My thesis planning started in the 1995 fall quarter, first by deciding on my thesis subject and then obtaining feedback on how to manage a design process which may lead to a successful visual design. The thesis planning items included project title, introduction, research and analysis, problem statement, mission statement, the creative process, time line and bibliography. When I gradually thought through and wrote down each section, I found my thinking to be much clearer than before and found more possibility and direction in my research.

With regard to the time line, the main portion is the thesis project dates. Besides the thesis schedule, I also put the school calendar in my thesis report. I thought that putting the whole time line in my thesis would help to better determine my project dates.

MISSION STATEMENT

I intend to re-explore all of the technology I learned from my graduate courses with professors Jim Ver Hague and Robert Keough. Therefore, this thesis in the museum of Formosan Aborigines will combine several software packages including Strata StudioPro™, Adobe Photoshop™, Movie Converter, SoundEdit™16, Adobe Premiere™, GrabAudio, VideoFusion™ and Macromedia Director.

In this thesis, I wanted to present the beauty of Taiwan and expand my knowledge of the aboriginal tribes through additional research. I will attempted to explain many aspects of Formosan aborigines and use an imaginative museum to express the aborigines' colorful traditional clothes, their beautiful singing and dancing, their environment, and their vivid culture. I hope it is pleasing and captures the attention of my audience.

RESEARCH & ANALYSIS

During the fall quarter, I took a full course load while continuing to research the data for Taiwan's indigenous culture. This subject has proven to be the biggest challenge to my design ability because of the

amount of information which needed to be digested; there are nine tribes in Taiwan. I needed to adhere to a strict schedule of arranging my time.

In beginning the research, the first step was to make a source location list by perusing the RIT library and local bookstores. But after entering the key words "aboriginal culture & Taiwan" in the computer, I was disappointed in it. There were only two books listed on the screen. I was trying to make a list which would prove useful to my research, but unfortunately, I could find no other books on the subject. I then asked some friends in Taiwan to collect news items about these minority tribes for me. At the same time, I had the opportunity of going to an art gallery in Ontario, Canada to use a multimedia production which introduced the gallery and presented its general layout. I reviewed more than 60 CD-ROM multimedia productions in Voyager Presents. I was hoping to gain some fresh and original concepts from them. I also used Netscape to attempt to locate any information related to Taiwan.

Two weeks later, I got some feedback from my friends. I received brochures, books, magazines, newsletters and cassette tapes, but in general, the information in these was not enough for me to use in effectively presenting the aboriginal culture to my audiences. It was, however, enough information to begin my analysis of the nine tribes.

In my opinion, analysis of the problem must always be the starting point. The solution of any problem depends largely on the degree of understanding of what the problem is. In consideration of this, I spent almost two months in research and analysis. My goal was to combine the new information with what I already knew, thereby establishing a basis for a creative solution.

I continued to ask my friends to collect videos, music, and audio CDs for me in Taiwan. I also contacted my professors, and after explaining the rough ideas to them, they both agreed that this was a good topic with which to present my thesis.

After the majority of the research was finished, I studied all of the

information I had in order to select the major subtopics of my thesis. I organized and separated the information into six categories: surroundings, religion, art, clothing, language and music.

In December I showed the sketches of my screen design and navigation map to my professors. This comprised my first draft of my thesis project outline (See Appendixes 1,2,3 and 4).

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THE CREATIVE PROCESS

In the Fall quarter, I began to read about the history of the these nine tribes and their relationship with each other. I tried to represent their history in a unique way by visual communication.

Later I created a storyboard to illustrate my thoughts (see Appendix 1). I thought that a storyboard would allow me to focus my thinking and provide accurate communication with my professors before I spent countless hours working on the project.

INCUBATION

Before I talked to my professors, I tried to identify my user audience. I figured that it would aid me in thinking about how this museum might look and work. I wanted to create it using 256-color for CD-ROM, because it would easily run in any kind of Macintosh model, not only Power Mac. I selected a standard color screen size of 640 x 480 pixels. For larger screen sizes, I used the XObjects command to set up the rear window for a more professional appearance.

On December 6, at our first regular meeting, I discussed my thoughts with my professors, Jim Ver Hague and Robert Keough (see Appendix 1). I showed them all of the research sources I had collected and discussed my next steps. Professor Ver Hague was very eager to see more of Taiwan's culture, although suggesting that I keep the idea simpler. I kept that in mind as I was deliberating over the screen design of this "visual museum".

PRESENTATION OF SCREEN DESIGN AND NAVIGATION ROUTE

I proposed my user interface to my professors on December 13. I presented two screens design and one navigation route to them as shown in Appendixes 2, 3 and 4. Appendix 2 presents two screen designs. The upper design displays a map of the distribution of Taiwan's aboriginal natives. This is displayed when the user first enters the museum. The lower screen design displays a typical wall in the museum. The box in the center is representative of a Quick Time (QT) Movie which was created using a 3-D program. The tribe name is

shown at the upper left of each screen. Located below the QT Movie is the Global Control Panel which contains the Main Menu, Introduction, Surroundings, Language, Clothing, Religion, Art, Music and Quit buttons. At the right side of the screen is listed important information pertaining to the subject. Under the text field is a floor plan of this tribe's museum. Appendix 3 shows a concept similar to Appendix 2, only simpler. Appendix 4 discusses the navigation route through the museum as well as the topics of focus.

Professor Ver Hague suggested that I keep the QT Movie size smaller, especially if I wanted to create all nine tribes using QT Movies. I chose this format to give the user the impression that they are moving in a real museum.

Professor Keough mentioned some other points, such as creating a generic QT Movie which will allow my professors to easily understand the museum navigation.

After considering the suggestions from this meeting, I decided on a QT movie size of 360 x 270 pixels and used the Strata Studio Program to create my first model.

BUILD 3-D MOTION

According to the plan of my visual museum, I tried to create the first model in Strata Pro. I used basic shapes to build my model because of an earlier "nightmare experience" attempt at creating animation during the Fall quarter. I attempted to show two sprites who built their own helicopter in a deep forest. I used a lot of complicate shapes in creating the trees. After all the time spent in setting up the model, I attempted to use raytracing to render it, but found that my computer did not have enough RAM to do the job. Because of all the extra things needed to be built into this thesis, I knew that I needed to keep it as simple as possible.

In Strata Pro, I used 2-D drawing and 3-D drawing tools to build the room, then lighting tools to insert local light sources. Lighting in a natural environment is a complex interplay of light, shadow, and reflec-

tion. In computer graphics, lighting is a mathematical process of providing the rendering application with a description of all the lighting sources in the scene. Because computer lighting mathematically mimics the physics of the light, it lacks some of the usual properties of lighting in the physical world. Setting the most realistic lighting possible was very difficult. I needed to put at least three light sources on one wall in order to have enough light to present the work. I set the lighting at a 45 degree angle. For the first wall it looked beautiful, like a genuine 3-D world. I then duplicated this light source for the remaining walls.

After setting all the light sources outside and inside the museum, I started thinking about how to annotate my animation. I continued to set up the frame layout (Appendix 5) according to the museum plan (Appendix 4). When rendering the picture, I chose 360 x 270 pixels at 72 dpi resolution, 256 colors, enabled dithering, Quick Time compression, and used phong shading. In this step, each Strata file contained a number of individually rendered pictures, however, the Macromedia Director Program could not support it. I needed to use a program called Movie Converter to convert the Strata animation into a QT movie. Then it may be imported into Macromedia Director as cast number and will not be counted among the components of Director itself. Using this method allowed each QT Movie to be a part of the application without occupying any Macromedia Director memory. This would enable the movie to play smoothly.

On December 20, I showed the 3-D motion to my professors. I had 38 short QT movies to show to them. Through these they could easily observe the actions resulting from each click of the mouse. Both of my professors thought the movements were very smooth and they were eager to see them utilized in my program. Their opinions gave me confidence in proceeding to the next step.

TEXTURE AND LIGHTING MANAGEMENT

The next step was to make and/or edit the textures. Each of the nine tribes of Taiwan have their own traditional structure. They made

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their dwellings from materials found in their local environment: bamboo, wood, stone slabs, or thatch. Like the Paiwan and Rukai, they have lived in traditional stone-slab houses for thousand of years. I wanted to simulate those textures in their museum, so I tried to import the surface maps from actual objects.

Although I had some books which showed their houses, there was not enough resolution in the photos to see the texture detail. I bought some professional photo CD-ROMs for texture samples. I was hoping they would contain a wide choice of wood, stone slabs, bamboo and thatch textures.

At the same time, I tried to render a small-sized animation in ray-tracing with texture detail and image quality set to normal, but encountered some problems:

Problem 1: Lighting

Earlier I mentioned that I needed to put three light sources in one wall in order to have adequate light to present the work and that the lighting was set at 45 degrees to make it look more realistic. After creating 19 walls in this museum, I noticed that each wall light reflected onto another wall, resulting in strange shadows. For this reason, I projected the light directly to the wall. This made the wall look plain and flat, and some lighting still reflected to other walls.

Problem 2: The pitched gable ceiling

In viewing the pictures when still, the ceiling texture looked okay, but the texture appeared very weird when animated.

Problem 3: The visual effect

In the beginning, I wanted the audience to imagine that they were in a huge museum. But when moving through the navigational route, sometimes the browsers will see other walls during their movement. Including the other walls in the field of vision makes the detail on the main wall diminish. I was unsure of the effect this would have on the viewer.

I discussed these problems with my professors when I met with them on January 3. Professor Keough asked me if I thought that the

texture of gable ceiling was very important to the introduction this tribe, and if so, I would need to find another ceiling texture to resolve this problem.

As for the others problems, they thought they would be all right. They also made another suggestion that I add some outdoor scenery that the audience would see as they were leaving the museum.

RECTIFYING THE 3-D MOTION

After the meeting, I continued to ponder these problems. I spent a lot of time trying to resolve the lighting problem, but to no avail. I also came to the conclusion that the gable ceiling was not that important for this museum. I needed to focus on the main wall and make it stand out. I decided to adopt an easier way to create my thesis and resolve the lighting problem.

I rectified my 3-D motion (see Appendix 6) so that this time, when the audience went into the museum, they would see six small rooms instead of a huge museum. According to the plan of this museum, the user would click directly on the preferred topic, and this would take them directly to the small room to view the information contained there. I thought this would be an easy way to build this museum. Even if I encountered some problems along the way, I could fix them easily and save the countless hours needed to render the picture again.

CREATING SURFACE TEXTURES WITH THE PRODUCTS OF CULTURE

The first tribe I depicted was the Yami which live on Orchid Island (Lan Yu). The reason I chose this tribe first was that I had acquired a lot of information on them. It allowed for a smooth start to my thinking process.

After rectifying the 3-D motion, I started to design the three main viewing walls. I used Strata Pro to render the walls in phong shading then imported it into Adobe Photoshop. Photoshop is the most powerful software for creating images. It allowed me to edit an image, create layers for separating my graphics and then merge the layers when

finished. When working in Photoshop, I preferred using 16-bit color (thousands) and saving the original as a 16-bit image. Only after my images had been completed and were ready to be integrated into a multimedia application did I reduce the color palette from 16-bit to 8-bit (256). So regardless of the monitor's setting, the image still contains 16-bits of color information, therefore, the image quality of my project is greatly improved.

For this museum, I also wanted the wall to appear like a mural painting, so I used a filter called KPT Find Edges Charcoal under Stylize to create the textures, invert them into a negative image and save them as a PICT file. In Strata Pro I used texture editing to merge the PICT image into the texture as a color map, opened the next expert-level dialog for adjusting the surface texture's properties and adjusted the maps to correct size. After the initial settings, I started rendering the picture by setting the size to 360 x 270 pixels at 72 dpi resolution, 256 colors, enabled dithering, QT compression, and rendered using ray-tracing.

CONVERTING THE QUICK TIME MOVIE

At the beginning of the 1996 Spring quarter, I finished the rendering of the Yami, Paiwan and Bunun tribes. I used a program called Movie Converter to convert the Strata animation to a Quick Time movie. Most of the time I encountered problems when using this program to convert my movies. When trying to convert seven or more movies, my computer would lock up and I would need to reboot. I used Norton Disk Doctor to diagnose the problem and it told me that an "error was found in a file record in the catalog b-tree" (?) and that the movie had an incorrect physical length. After chosing to fix it, everything was fine. I asked my professors about this problem, but we could not determine the real cause for it.

I found that the movie size was about 1.3 Mb. I thought the movie was too big for CD-ROM (considering each tribe contained about 45 movies, and I wanted to fit all nine tribes on one CD). I decided to

compress the movies in cinepak to make them smaller. After doing that, I found that I did not like it because the playback speed was poorer than that saved in animation format, and the quality was also very poor. Things did not improve even after setting it in millions of colors and assigning a quality setting of 100. For this reason, I decided to keep my original movie format instead of convert it to cinepak.

REDESIGNING THE SCREEN

With the three tribes' QT movies completed, I went back to review my previous screen designs once again (see Appendixes 2 and 3). I thought it looked alright but I wanted to try more experimentation. I figured that the more I created, the better I would get, therefore, I continued to create different styles of screen design (see Appendixes 7 and 8).

I discussed these different designs with my professors. They thought both screen designs looked fine, but they preferred the one at the top of Appendix 7. They thought that placing the text on the right side appeared better than on the left. As for me, I preferred the design in Appendix 8. The first reason was the Museum title variations. The second reason was the use of brown colors which gave me a feeling of antiquity and "earthy-ness". In combining the professors' opinions with my own, I tried placing the text on the right but I thought it looked awkward. Therefore, I created another which I chose for my final project (see Appendix 9).

In this screen design, the first thing to be noticed by the viewer was the use of colors which attempted to provide a clear image of antiquity. The viewing frame was created by using deep brown colors, providing stark contrast for the Quick Time Movie which I created in Strata Pro. Surrounding the frame was the project title, "Museum of Formosan Aborigines", arranged in the same manner shown in Appendix 8. The main text was easily discernable at a glance, with other text barely visible, floating in the black background. It explained that this museum was "struggling to keep their rich traditions from being

assimilated into other cultures and tried to preserve their rich past and stimulate even greater cultural vitality". Listed on either side of the frame were global navigation tools which include Map, Main Menu, Help and Quit buttons. At the top of the frame, in the center was the title of this tribe and at bottom was a text field and three navigation buttons (go right, go left and go forward).

I think that this screen would prove to be the most eye-catching and evoke feelings of yearning for the past. That was the reason why I choose the design shown in Appendix 9 over those of Appendix 2, 3, 7 or 8.

CREATING THE PROTOTYPE

With the functional space complete and the creative ideas in place, it was time to start my thesis project. I used a friendly authoring tool, called Macromedia Director, to build up my project. I imported the Quick Time movies on the "Stage" and assigned them instructions by writing a "Script" in a special window called the "Score". Even at this stage, I found a problem with my Quick Time movies.

I rendered 15 frames per movie in Strata Pro. In the program, in order to move from the first wall to the next, the first movie would play frames 1-15 in ascending order, to move to the third, frames 16-30, and so on. I added a command in Director to stop movement on frames 15, 30, and 45 to define the end of each movement. When I imported them into Director and clicked on the left direction button, everything worked fine. But when clicking to the right, the frames would count down from frames 45-31, 30-16, etc. It would never reach the desired end position of frame 30 or 15. The only way to resolve the problem was to open each movie in Photoshop, where each was brought in as 15 separate PICT files. I then added frame 15 to the beginning of the second movie, and frame 30 to the beginning of the third. This would allow the movement to stop on the desired frame regardless of the direction.

CREATING ROLL-OVER

Roll-over is a common user interface design in Director Pro used to help identify hot spots. These are altered graphics that display themselves when the user simply "rolls" over a hot spot with the cursor using the mouse. For example, while the user is moving the cursor around the screen, looking for something to do, certain graphics will change or highlight as the cursor passes over them. This way, users can easily get a sense of what's "clickable".

In my thesis, I designed it so that when the user moves the cursor over the main wall, it will display text to explain the particular picture. The only problem I encountered at this stage was the limited number of channels available for the images and text. Each channel occupies a row in the score, and is able to hold one sprite or one special effect. The score provided 48 channels which, unfortunately, was not enough for all the images and text which I desired to use in my project. The Language room proved the most difficult for displaying all of the desired pictures.

EDITING THE SOUND

Sound is a key element in creating and establishing an environment. It is often underestimated and underutilized in multimedia production. Although I have nine audio CD's for nine tribes, I though it was not suitable for background music. Their music, in particular, features the earliest form of human musical expression in a vocal way. Almost every singing style known to mankind, such as monophonic singing, polyphonic counterpoint, etc. can all be found in aboriginal music in Taiwan. Because the CD's were earnestly represented, the disappearing treasures of musical heritage was lost causing most music to be solo. If I used it as background music, it would feel boring. Therefore, the background music was found in other ways.

For the traditional music, I recorded in SoundEdit Pro and incorporated effects, such as echo or shift pitch, etc. to edit it, then I saved the file as Audio Interchange File Format (AIFF). I think that the AIFF

format always provided the most flexibility and imported AIFF files directly into the Director Cast to be played back from the available RAM for fastest playback.

VIDEO CAPTURE

Since I got the videos from Taiwan, I browsed the video twice and recorded ideas in my sketch book, then compared with audio CD of this tribe. I tried to find special customs or celebration ceremonies to please my audiences.

The first software program I used to capture the video was VideoFusion. Because video cameras are designed to capture moving images, it is difficult to get sharp still images from a video capture. Therefore, when I set the monitor to 256 colors, the resolution on the screen looked poor and played too slowly. I can only use thousands of colors to record the video.

In Photoshop, I created the title page and imported it into Adobe Premiere. Premiere was another excellent software choice for capturing and editing video. Its filters provided a wide variety of special effects. I used a filter effect in the title page and end of the movie. According to each tribe's characteristics of music and video, I chose different effects to explain it. I also used transitions to link each imported file and made it look better. When I made a movie, I set the outputs as QuickTime Composite, Compression in Cinepak, using millions of colors, 100 percent quality and for motion, 15 frames per second.

In this stage, the problem still remains in the video quality. I captured the the image in thousands of colors but I needed to change the monitor to 256 colors in Director Pro. Therefore, the movie still looks faded.

Professor Robert Keough suggested me to use the sharpen effect under the filters in Premiere and discovered it did not help. The image was dotted with black. I tried to export the movie as a PICT file, imported it into Photoshop, saved it as an index color and imported it

into Premiere again, but it didn't have any improvement.

TEXT

When I presented type on the screen, I did not include too much text. Because people will not read a lot of text on the screen, writing the text for multimedia should be concise and limited.

I preferred to choose "text field" in the Director program first. Because it is a true text file, it can be edited, and its point size and leading can be changed. On the other hand, English is not my first language and most of my resources are Chinese, I spent a lot of time editing text. Then I invited my tutor to my apartment to help me corrected the spelling and grammar. When it was done, I converted the text into a bitmap file.

Once the text has been converted into a graphic, it loses its text properties. It can no longer be edited, checked for spelling, etc. But because it's a graphic, I have greater control over its appearance.

CREATING "INTRODUCTION"

When the users open this project, they will see an introduction. In this part, I used a different type to explain my thoughts and why I have created this museum, then new music comes up which tell audiences the nine tribe's name. Meanwhile, 16 movies which flashed nine tribe's still images arranged as 4 rows and 4 columns played at the same time.

Professor Jim Ver Hague suggested that it will be better to see the tribe's name, while hearing the name. This is beneficial because most audiences do not know the name of these tribes. Using the sound and text at the same time will give the users a strong lasting impression. I accepted my professor's advice and put the tribe's name in the center.

What I did was import the still images from Photoshop to Director. Each small Director movie has a different frame length. I exported them as Quick Time Movies, then imported all of those small movies into one Director movie. I looped and played them at the same time.

CREATING "MAIN MENU"

After the audience sees the introduction, the main menu will directly come up. In main menu, a series of still images with the tribe name appears from left to right on the screen. The users could use the mouse to select the topic they like, then they will go to the next screen. The next screen will show a map of this particular tribe on the right hand side and a door on left hand side. I placed text and a ticket in the center. The users can use the mouse to drag their ticket to the door in order to enter the room pertaining to that tribe, or they can double click on the ticket and go back to the main menu.

CREATING "HELP"

I wanted to present this project in such a way that users intuitively know how to navigate through it. For this reason, I chose some important sections, reduced the original screen size and put it on the right hand side of the help screen. It was designed to look like a real screen so that people could make quick assumptions about how to use it. The right hand side contains text to explain what is seen on the screen. Users can use the mouse to go back and forth, and close the guide when they are done.

DEBUGGING

The complexity of an interactive multimedia project always needs to ensure that there are no "bugs" there. Bugs are everything from major bad functions that crash the computer to minor problems like having the wrong size appear in the text window.

I needed to go through the title, click on every button, rollover all of the features, and keep a record of every bug I found. I created a screen diagnosis to find the bugs and checked it and fixed it if necessary (see Appendix 10).

Most of time I worked in my apartment and I was sure that everything in my computer was fine. When I ran the project in school sometimes I encountered trouble. For example, the text was not changing

to bitmap... etc. I think that the more I tested, the more I found.

COMPUTER OUTPUT FOR THESIS SHOW

When I prepared the color output for my thesis show, I decided on the 11" x 17" format for each poster. I asked my friend in the Printing Department for an opinion. He told me I needed to use 300 d.p.i. at least for each poster, otherwise the results would come out with the printed dots, lowering the quality of resolution. After considering his opinion, I decided to use my original screen size of 640 by 480 pixels for each poster.

I separated my printout into two parts. The first part, three posters, only had type which told my audiences why I chose this topic. The second part, nine posters, introduced some interesting topics to my audiences.

At the same time, I got permission to do a color output in the Printing Lab. I chose Dye-Sublimation (3M Rainbow) instead of the Canon CLC500 because I knew the quality of Dye-Sublimation came out nicer than the Canon copy did.

Unfortunately, the machine was broken during the time of print out. In order to keep the visual effect, I could only choose the CLC500 instead of the Dye-Sublimation.

The final stage was framing. I put the white cardboard around my image to protect the work and arranged them in series in front of my computer.

THESIS SHOW AND EVALUATION

The thesis show was arranged on May 3 from 7-9 pm. In this thesis show, I found two problems with this project.

The first problem was found in next screen of main menu. I used a different color to separate the text from the ticket and instructions. Some users didn't read it and realize they could drag the ticket to the door or double click on it in order to go back to the main menu.

The second problem occurred when the users went into the room.

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T H E
CREATIVE 28
PROCESS

This project was mounted on each wall. The users should use the mouse to move the cursor around the wall, then they can look for objects that change when their cursor moves over them. I found most of the audiences only clicked on the right or left arrow to view the wall, then left. Although I created "help" to show users how to use this project, I seldom saw people read it before they experimented with this project. I think that was one problem. I can fix them after the thesis show.

Generally speaking, most of the audiences liked my project. They thought it was a good topic and a good way to let foreigners build an understanding of Taiwan's culture. They also thought the screen design was beautiful, but played on a 17 inch screen, was a little small.

For this project I felt my creative process became more organized, and some diagrams I created were more thoughtful than before.

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ABORIGINES
YUAN-FENG

CONCLUSION

I think that the creative process is generated by problems with visual communication. As a multimedia designer, my challenge is to organize and categorize information, then integrate and present information in a meaningful way.

In this project, the overall structure was clear. The users can know where they are and know where they want to go. The museum floor plan provides instant access to all of the rooms of the topics, so the user can easily see available options, and quickly jump to various areas. For example, I placed a forward and background button, help and exit button on every screen.

What I ignored was, after completing the prototype, I did not make a test with my audiences. In the thesis show, I found that the users expect a response immediately after they clicked the mouse. In the absence of immediate action or providing some indication, I assured the users that if they wait they will see results. Such as my case, the users did not move the cursor to the main wall, they just clicked on the go right or go left button. When they discovered this, they showed great surprise and gave an acclaim to this project. However this problem has been fixed after the thesis show.

From this experience, I felt that designers always design based on their own experiences and knowledge of the world, but we can not assume that the audience shares the same perspective or feeling with them. Focusing on the user is very important. We learn all of the experience that we can from our audiences in order to anticipate their reactions and see your project from the users' perspective. The more we test, the more the project becomes successful.

Another experience I learned from this project, was planning my processes in advance and learning efficient production techniques will save me time, money, and effort. For example, I can use Share.Dir when I am working on two or more related movies that share many of the same cast members, or I can create some figures to help me to consider and to diagnose.

To sum up, this thesis has successfully developed an electronic

resource for the art museum and it will be a prototype accessible to museums around the world. At least, I believe that this project has become more and more useful to other foreigners in order to succeed not only to see the aborigines in Taiwan, but also understand their culture. I think I have accomplished a success in translating Taiwan culture.

APPENDIX

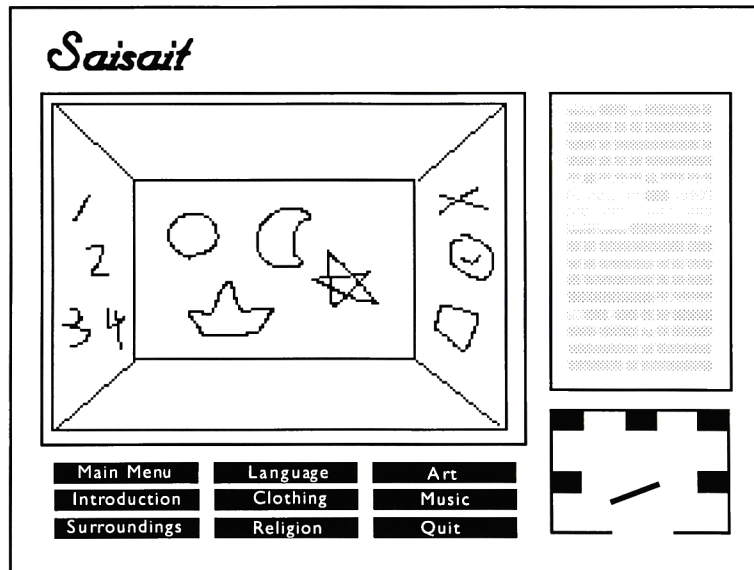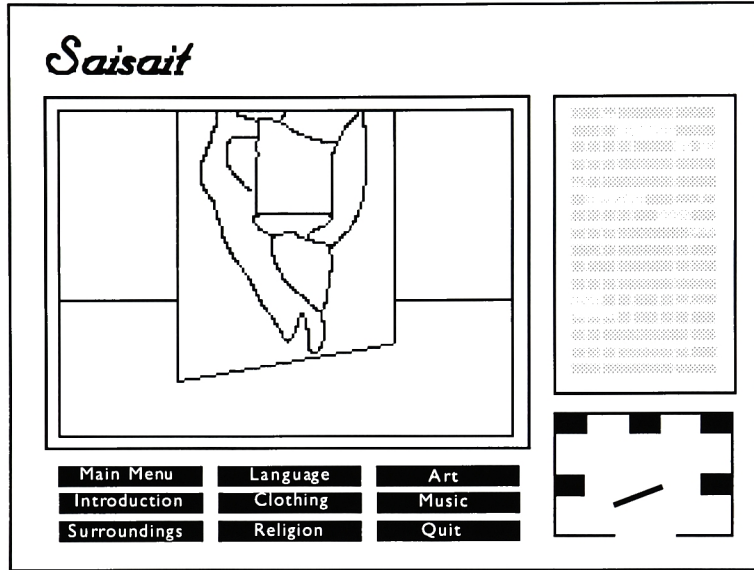## APPENDIX 1: A STORYBOARD FOR THE MUSEUM OF FORMOSAN ABORIGINES

```
                    ┌─────────────────┐
            ┌──────▶│  Introduction   │
            │       │       ①         │
            │       └────────┬────────┘
            │                │
            │                ▼
            │       ┌─────────────────┐
            │  ┌───▶│   Taiwan Map    │◀──────────┐
            │  │    │       ②         │           │
            │  │    └────────┬────────┘           │
            │  │             │ ▲                  │
            │  │             ▼ │                  │
            │  │    ┌─────────────────┐           │
            │  │    │   Museum&Map    │           │
            │  │  ┌─│       ③         │─┐         │
            │  │  │ └─────────────────┘ │         │
            │  ▼  ▼                     ▼         │
    ┌───────┴──────────┐        ┌─────────────────┐
    │      Help        │        │      Quit       │
    │       ④          │        │       ⑤         │
    └──────────────────┘        └─────────────────┘
```

MUSEUM O F FORMOSAN ABORIGINES YUAN-FENG
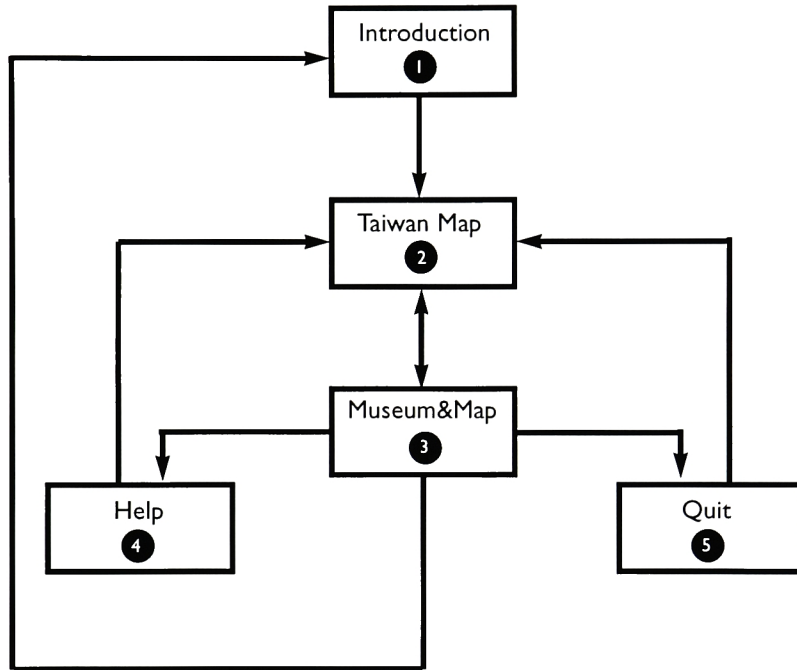
DESCRIPTION

① Introduction: When users first run this project, an animation is played that displays the title and the still images of nine tribes. This part will attract the audience's attention.

② Taiwan Map: There are Atayal, Saisiat, Bunun, Tsou, Paiwan, Rukai, Puyuma, Ami, and Yami in this part. When the introduction of animation finishes, a distribution of Taiwan's aboriginal peoples will come out, the users can click on the map and go to the museum of this tribe.
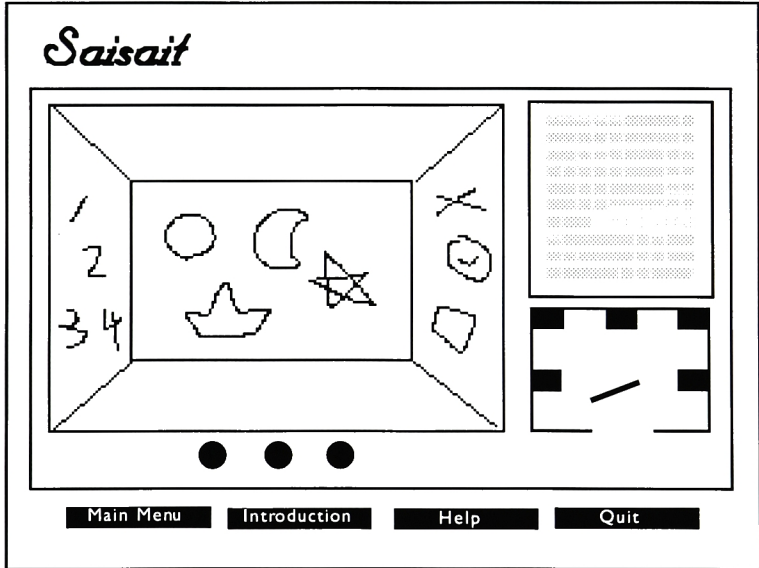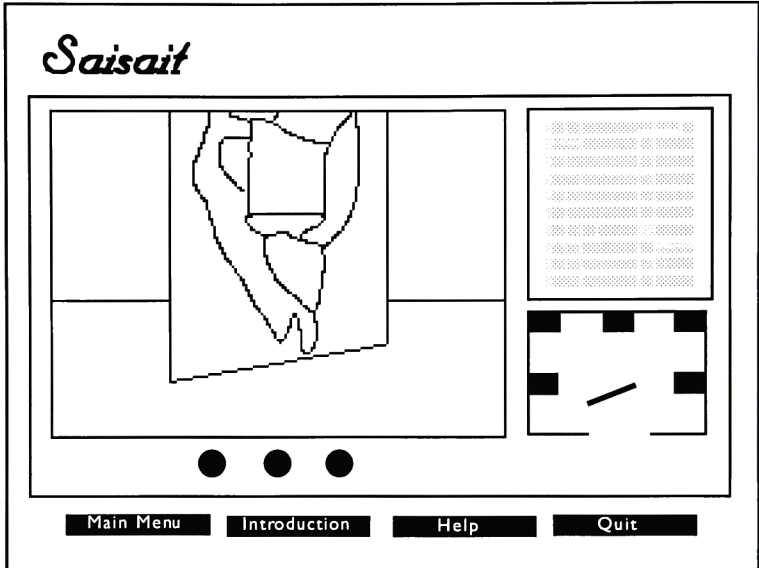
③ Museum&Map: There are six major parts here: Surroundings, religions, art, clothing, language and music. I will try to put all the navigations panel, 3D visual museum, and short text in one screen, I think that it is clear to the users what information they can know.

④ Help: I will use animation to introduce all the buttons which users should know.

⑤ Quit: Exit from this project and show all the credit line.
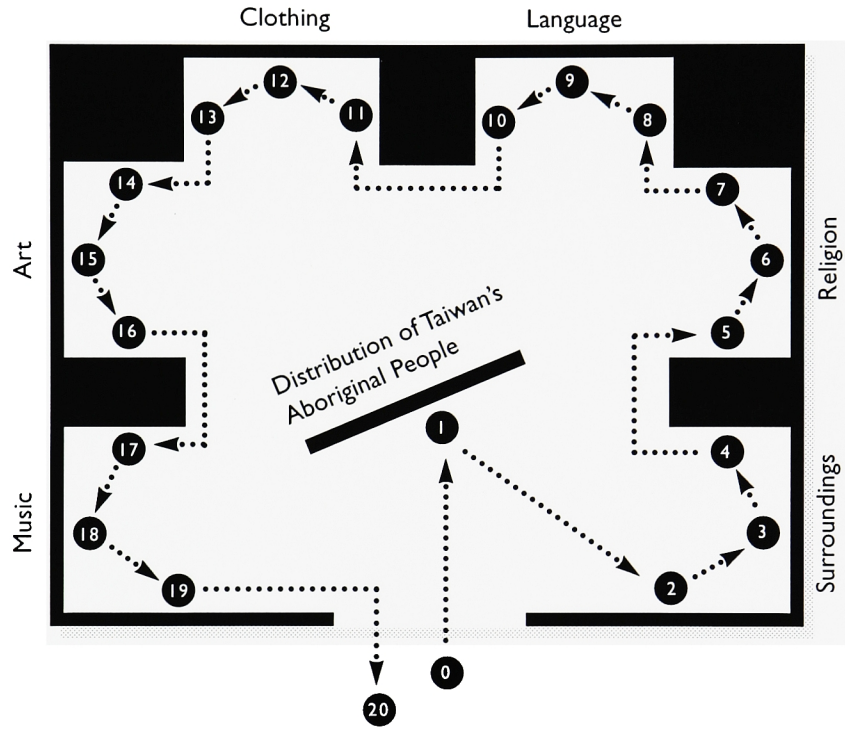
APPENDIX 2: SCREEN DESIGN
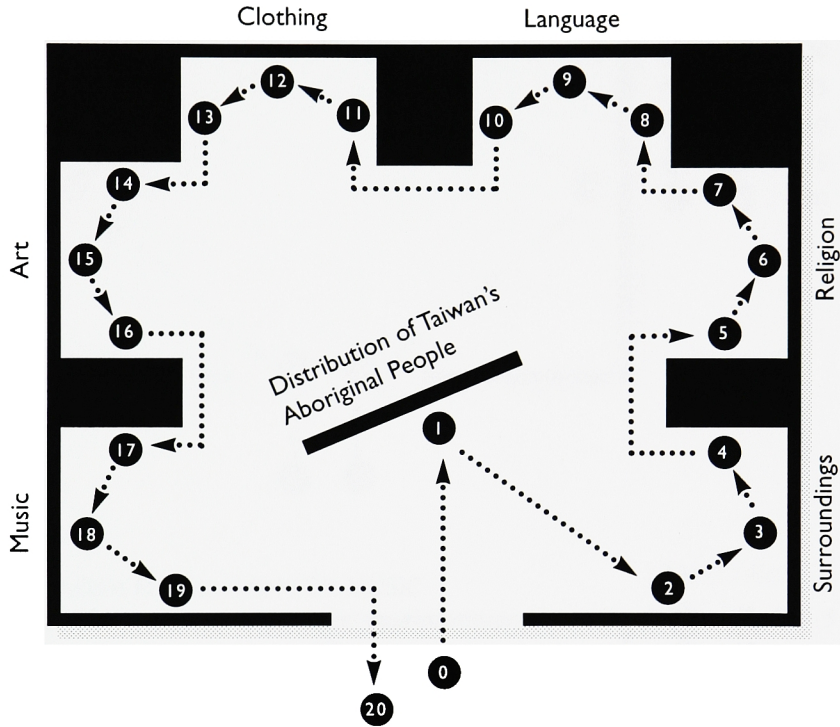
APPENDIX 3: SCREEN DESIGN

APPENDIX 4: MUSEUM FLOOR PLAN

Clothing   Language

Art

Religion

Distribution of Taiwan's Aboriginal People

Music

Surroundings

12 13 11 9 10 8 14 7 15 6 16 5 17 4 18 3 19 2 1 0 20

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YUAN-FENG

APPENDIX 5: MUSEUM FLOOR PLAN

Clothing   Language

Art

Music

Religion

Surroundings

Distribution of Taiwan's Aboriginal People

MUSEUM
O   F
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ABORIGINES
YUAN-FENG

FRAME LAYOUT:

0 — 1	001-015	7 — 8	181-210	14 — 15	346-360
1 — 2	016-075	8 — 9	211-225	15 — 16	361-375
2 — 3	076-090	9 — 10	226-240	16 — 17	376-420
3 — 4	091-105	10 — 11	241-285	17 — 18	421-435
4 — 5	106-150	11 — 12	286-300	18 — 19	436-450
5 — 6	151-165	12 — 13	301-315	19 — 20	451-480
6 — 7	166-180	13 — 14	316-345		

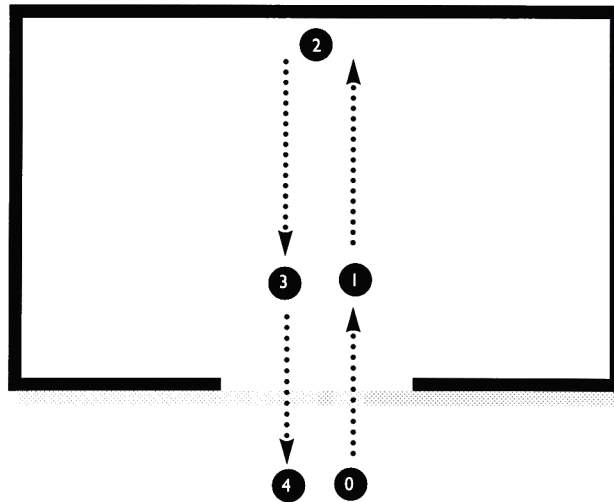## APPENDIX 6: MUSEUM FLOOR PLAN FOR SURROUNDINGS, RELIGION, ART, CLOTHING AND LANGUAGE.

FRAME LAYOUT:
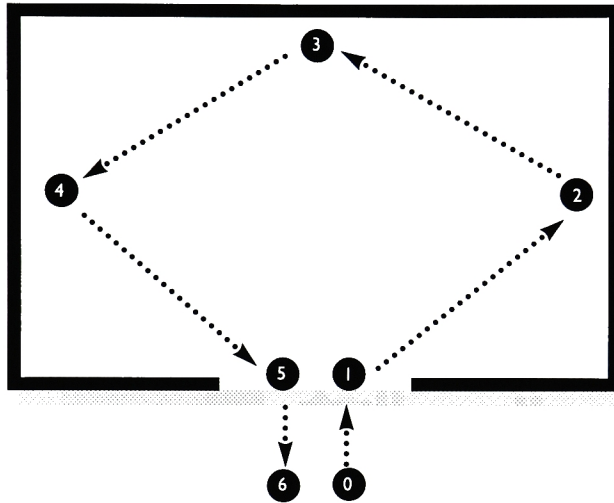
0 — 1 01-15
1 — 2 16-30
2 — 3 31-45
3 — 4 46-60
4 — 5 61-75
5 — 6 76-90

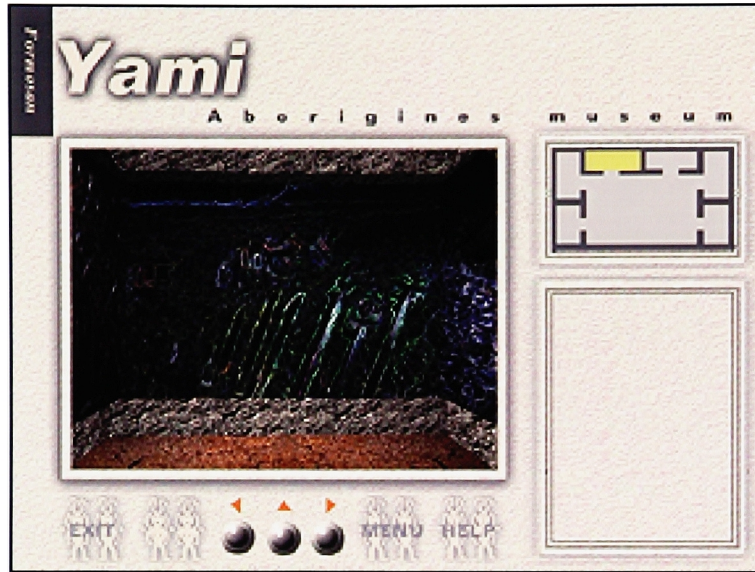## MUSEUM FLOOR PLAN FOR MUSIC

FRAME LAYOUT:

0 — 1 01-15
1 — 2 16-30
2 — 3 31-45
3 — 4 46-60

APPENDIX 7: SCREEN DESIGN

Yami
Aborigines museum

EXIT   MENU HELP

Taiwan Indigenous Culture   *Paiwan*

Quit   Main Menu   Help

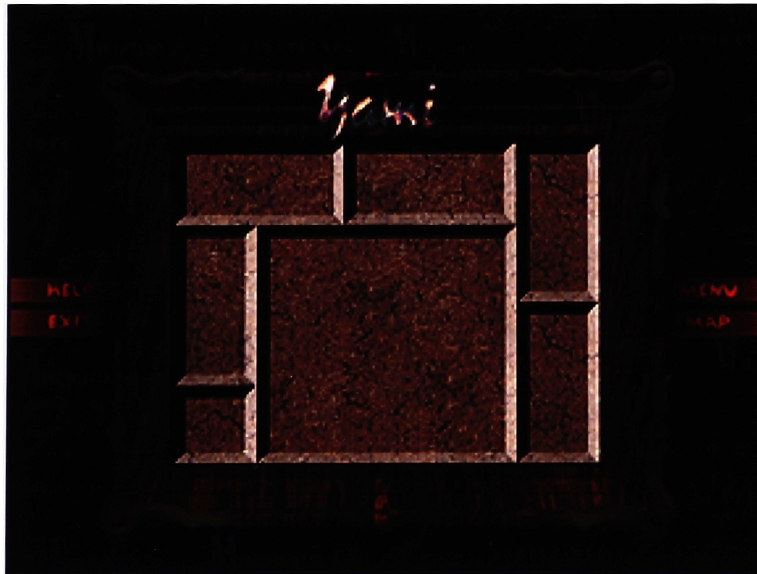**APPENDIX 8: SCREEN DESIGN**
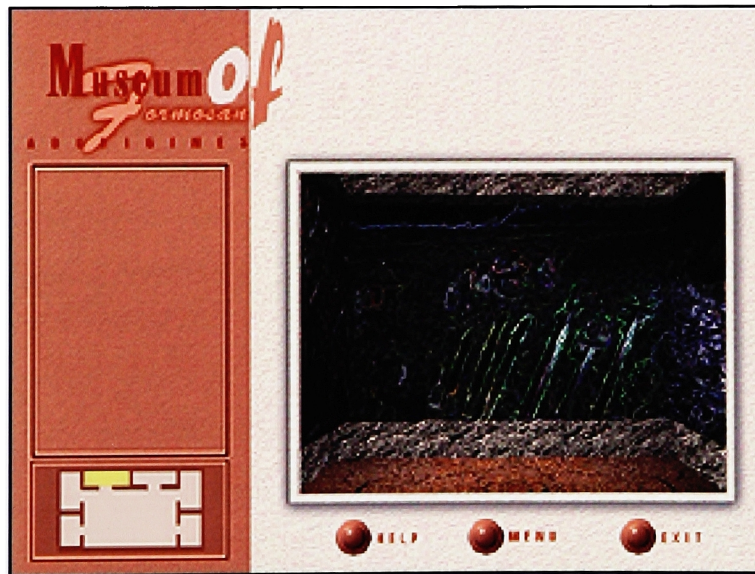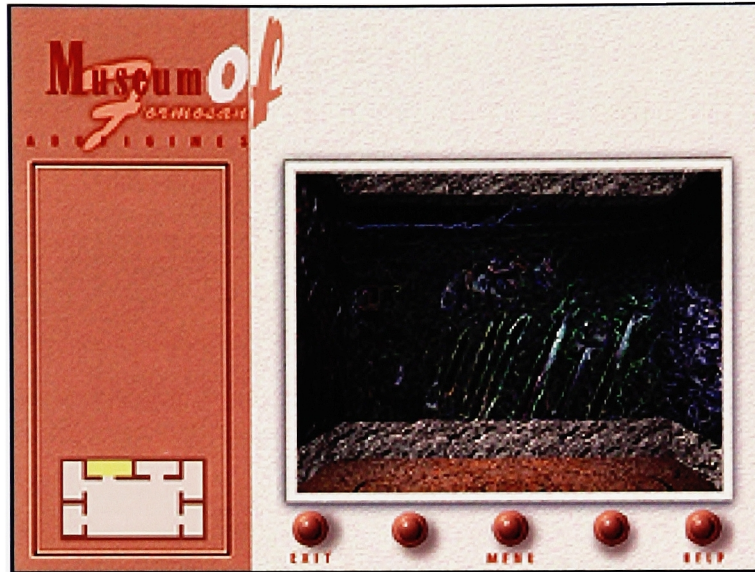
MUSEUM
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APPENDIX 9: SCREEN DESIGN

12APPENDIX 10 : SCREEN DIAGNOSIS

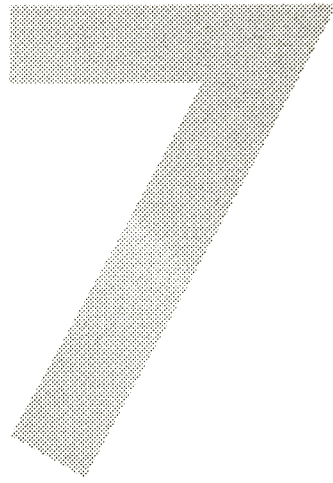Screen Title:Museum of Formosan Aborigines: <u>Yami</u>

Background Sound:_____

Background Sound of Map: _____

Room	Button	✓	Button	✓	Button	✓
Map	Menu		Surroundings		Language	
	Help		Religion		Music	
	Map		Art		Out	
	Exit		Clothing			

Room	Button	✓	Button	✓	Rollover	✓
Surroundings	Menu		▲		Frame 30	
	Help		▼		Frame 45	
	Map		◄			
	Exit		►		Frame 60	
Religion	Menu		▲		Frame 30	
	Help		▼		Frame 45	
	Map		◄			
	Exit		►		Frame 60	
Art	Menu		▲		Frame 30	
	Help		▼		Frame 45	
	Map		◄			
	Exit		►		Frame 60	
Clothing	Menu		▲		Frame 30	
	Help		▼		Frame 45	
	Map		◄			
	Exit		►		Frame 60	
Language	Menu		▲		Frame 30	
	Help		▼		Frame 45	
	Map		◄			
	Exit		►		Frame 60	
Music	Menu		▲		Video 1	
	Help		▼			
	Map		◄		Video 2	
	Exit		►			

TIMELINE 7

TIMELINE

SEPTEMBER

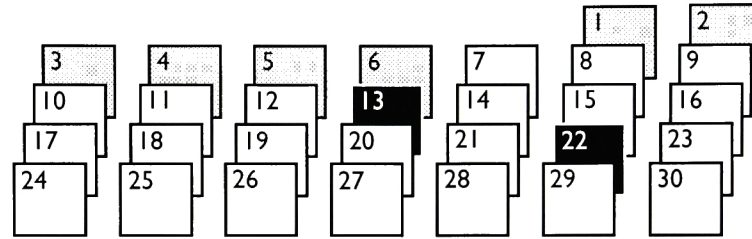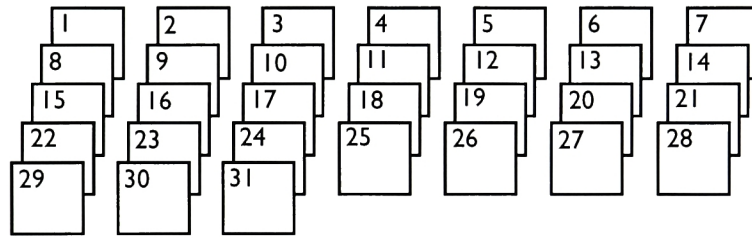|					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

•Summer/Fall Break   •Individual discussions with Professor Robert Keough   •sent thesis proposal

•Point of emphasis: Research and analysis of Native American people.

OCTOBER

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

•Point of emphasis: Change the topic to Formosan Aborigines.
Research sources.

NOVEMBER

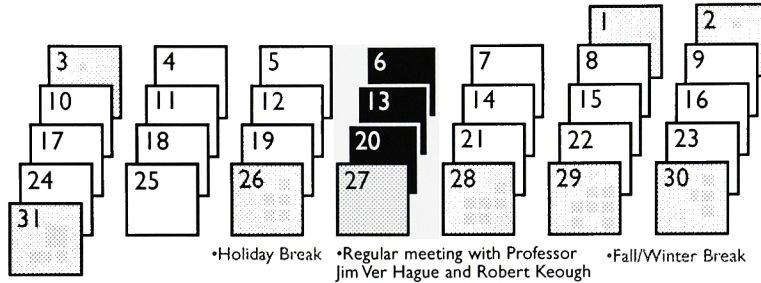|			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		
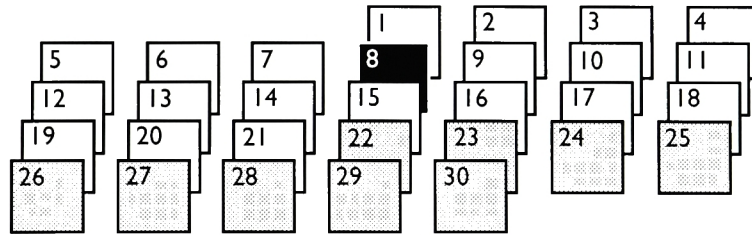
•Graduate thesis meeting
(Handout thesis show schedule)

•Fall/Winter Break

•Point of emphasis: Research and analysis of Formosan Aborigines.
Create storyboard.

DECEMBER

							1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31

•Holiday Break •Regular meeting with Professor   •Fall/Winter Break
                 Jim Ver Hague and Robert Keough

•Point of emphasis: Screen design.
                    Create navigation road.
                    Build 3D model and motion.

JANUARY
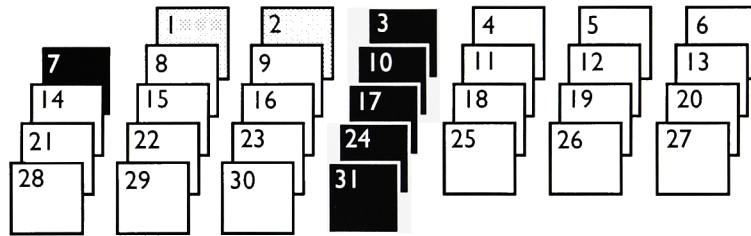
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31

•Individual meeting with   •Holiday Break   •Regular meeting with Professor
Professor Malcolm Spaull   Jim Ver Hague and Robert Keough

•Point of emphasis: Rectify the 3D motion.

FEBRUARY
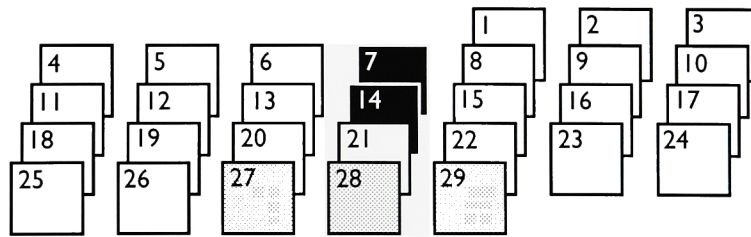
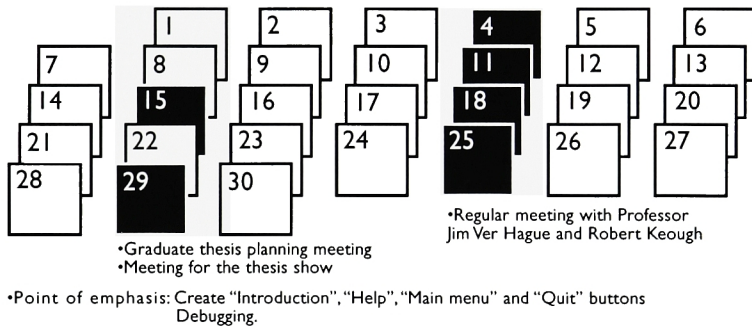|				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29

•Spring Break •Regular meeting with Professor
               Jim Ver Hague and Robert Keough
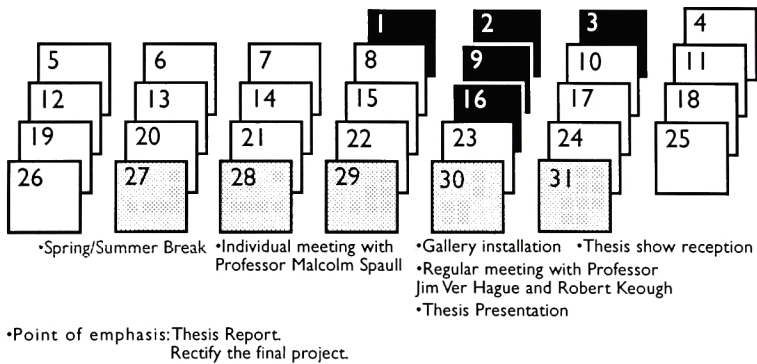•Point of emphasis: Rendering animation for Yami, Paiwan and Bunun.
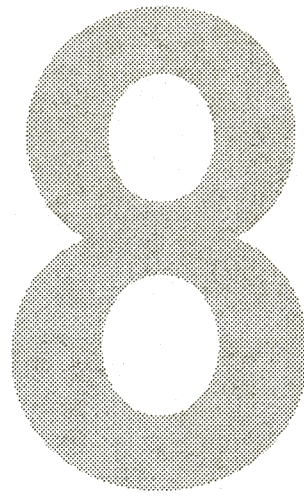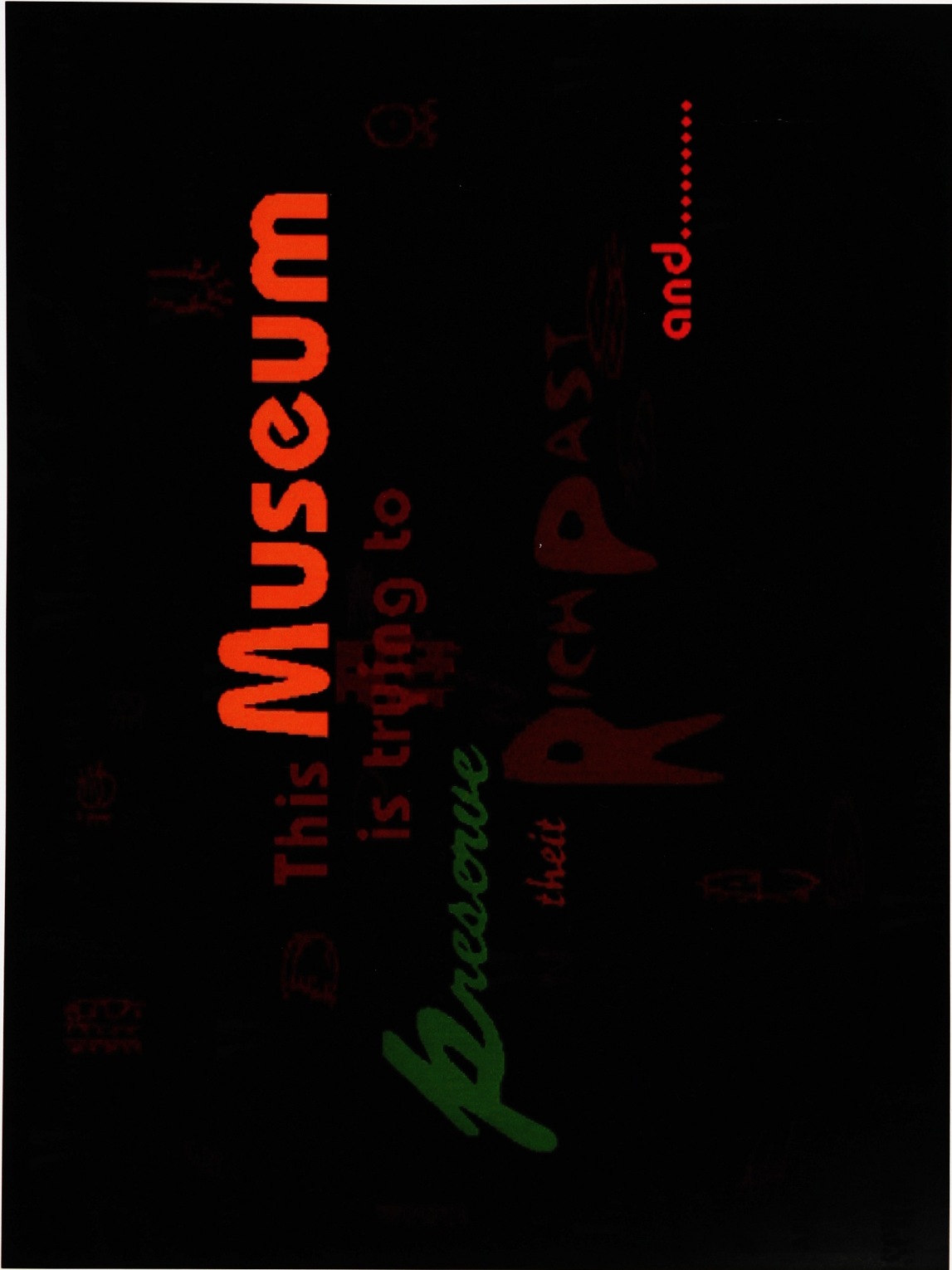
MARCH

					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

•Spring Break   •Regular meeting with Professor
                                 Jim Ver Hague and Robert Keough

•Point of emphasis: Finish Quick Time Movie for Yami, Paiwan and Bunun.
                    Create prototype.
                    Recording music and editing video.

APRIL

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

                                 •Regular meeting with Professor
                                 Jim Ver Hague and Robert Keough
•Graduate thesis planning meeting
•Meeting for the thesis show

•Point of emphasis: Create "Introduction", "Help", "Main menu" and "Quit" buttons
                    Debugging.

MAY

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

•Spring/Summer Break •Individual meeting with   •Gallery installation •Thesis show reception
                     Professor Malcolm Spaull   •Regular meeting with Professor
                                                 Jim Ver Hague and Robert Keough
                                                 •Thesis Presentation

•Point of emphasis: Thesis Report.
                    Rectify the final project.

WORK 8

MUSEUM
O F
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WORK **50**

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ABORIGINES
YUAN-FENG

WORK **53**

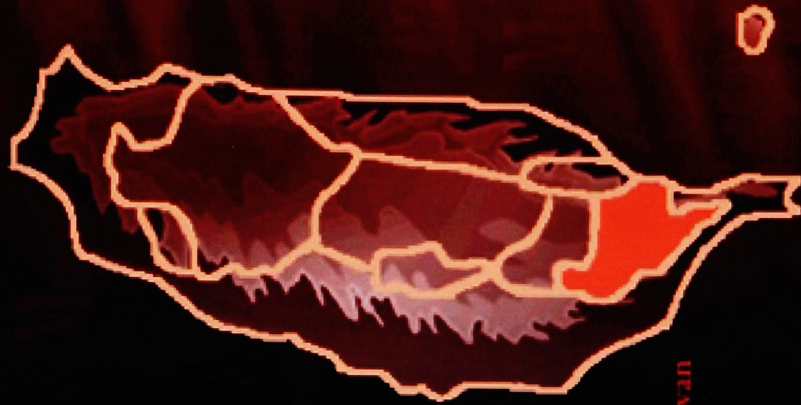**MUSEUM O F FORMOSAN ABORIGINES**
YUAN-FENG

The Paiwan live in the mountains at the southern end of Taiwan and are divided into the Raval and Butaul branches. They live by farming as well as hunting, animal husbandry, and creek fishing.

They have a social system based on land ownership, and their kinship is ambilineal.

The Paiwan are noted for their wood and stone sculpture. The Butaul branch holds a major sacrificial rite every five years, called Marubuk, to invite the spirits of their dead ancestors to come and bless the living.
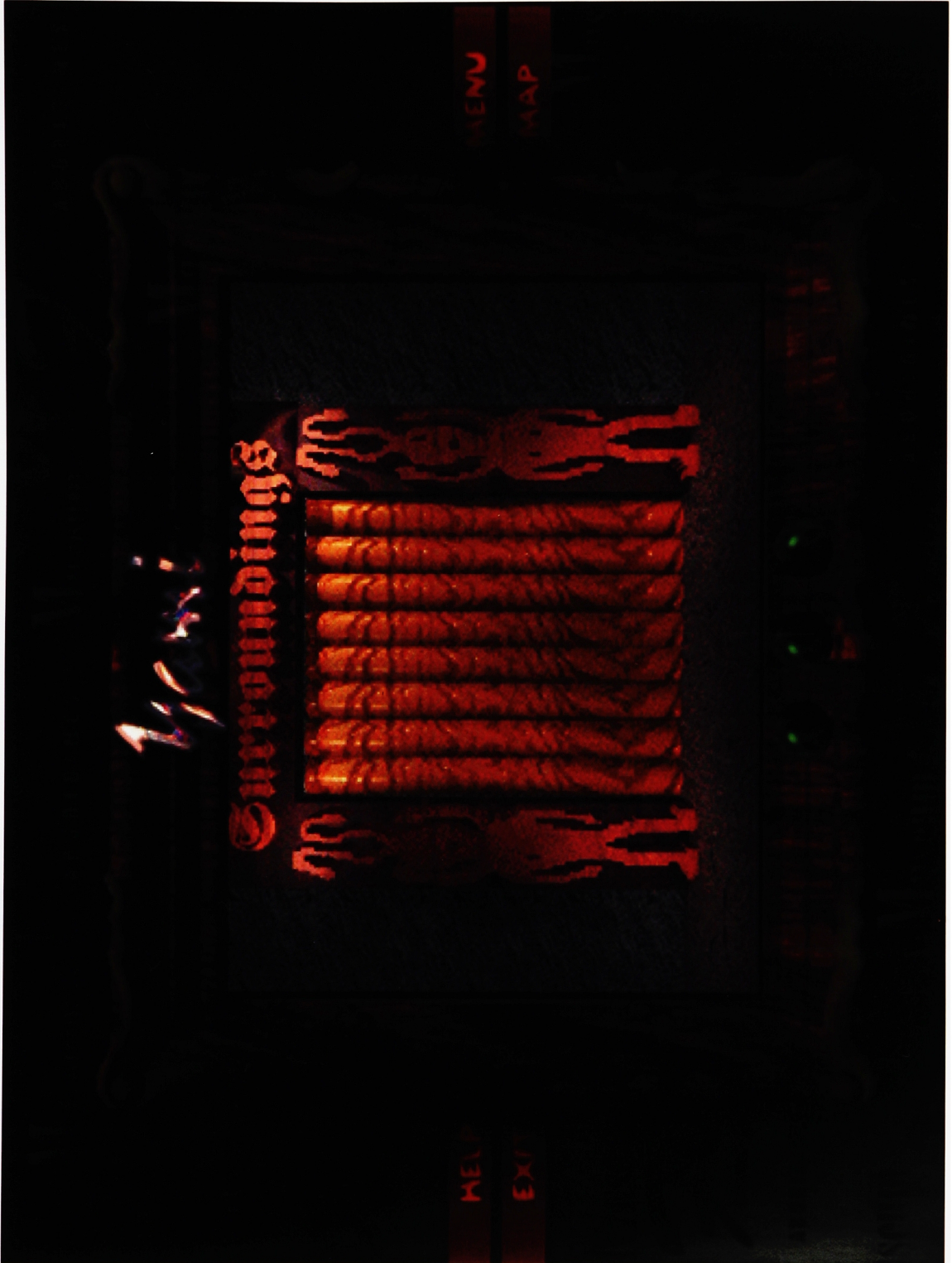
Drag your ticket to the door to learn about Paiwan culture or double-click the ticket to see other tribes.
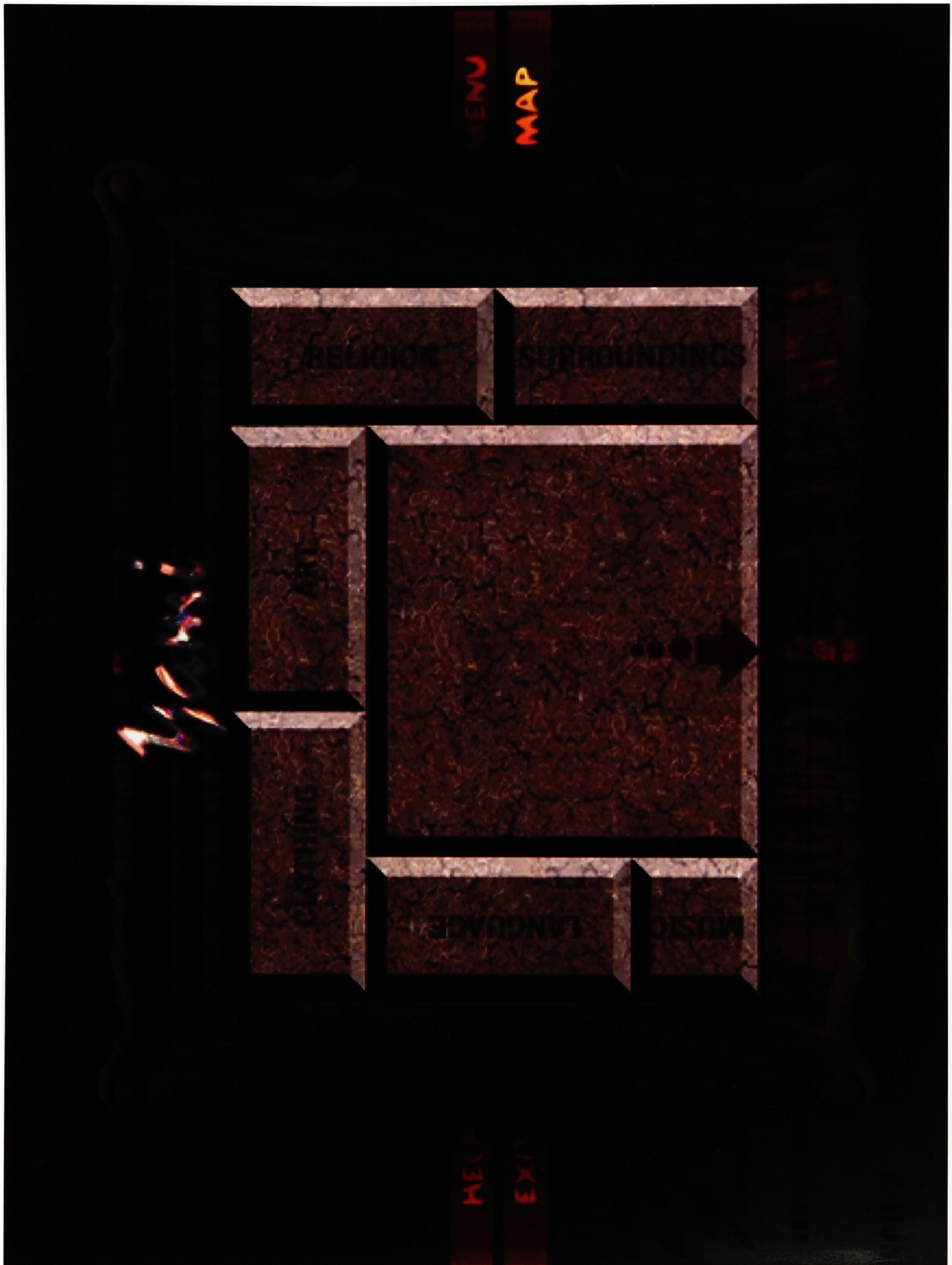
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