This is to certify that the

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THE BEST OF BOTH WORLDS:
A COMPARISON OF HYPERMEDIA AND VIDEO PRODUCTION

presented by

Rachel Luisa Torgoff

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Carrie Jill Heeter
Major professor

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THE BEST OF BOTH WORLDS:
A COMPARISON OF HYPERMEDIA AND VIDEO PRODUCTION

By

Rachel Luisa Torgoff

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ABSTRACT

THE BEST OF BOTH WORLDS: A COMPARISON OF HYPERMEDIA AND VIDEO PRODUCTION

By

Rachel Luisa Torgoff

"The Best of Both Worlds: A Comparison of Hypermedia and Video Production" provides a look into some of the similarities and differences involved in producing hypermedia and video projects based upon the author's hypermedia project, available at the MSU Department of Telecommunication. This comparison extends beyond the role of producer and posits research questions that relate directly to users and viewers. The final analysis asserts that to provide seamless technical integration of the two media, higher technical standards are necessary.

The body of the manuscript describes the authoring software program, HyperCard, its basic elements and structures. Following this, various ways that hypermedia and television take the user and viewer into account during program development are discussed. The latter portion moves away from program layout and style development, and explores some of the resolution, technical, and production considerations and restrictions, ending with a personal and theoretical discussion, and the author's recommendations.

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I also wish to thank Bob Albers, Video Production Specialist at Michigan State University, for his help and encouragement during my time in the Master's program at Michigan State University.

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I would also like to thank Julie Soltow for her expertise and assistance in formatting this manuscript and getting it bound.

Finally, I would like to extend my deepest and warmest thanks to my mom and my dad, without whom none of this would be possible. I would just like to say "Dad, you'd be proud."

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CHAPTER I

INTRODUCTION

If I were to produce a thesis project in partial fulfillment of a Master's degree in the Department of Telecommunication as a video documentary, the program would take on a linear dimension. There would be a story that would have a beginning, middle and end and a natural progression and transition between the segments. For example, if the program was on safely disposing of and managing low-level radioactive waste (LLRW) in Michigan, when the program got to a segment that presented 5 disposal options for a low-level radioactive waste facility, a voice-over, or on camera announcer would ask the viewer to think about which disposal option they would choose. The disposal options would be presented in as unbiased a view as possible. To be objective, these options would be edited together and presented in alphabetical order.

However, the program produced for this thesis was not developed on video. Rather, it was developed in HyperCard, a hypermedia authoring package for creating interactive software. Unlike video documentaries, HyperCard hypermedia programs are not developed in a linear, start-to-finish fashion.

This thesis will discuss the similarities and differences of producing an interactive hypermedia program as compared to producing a video documentary program on safely disposing of and managing LLRW in Michigan.

Chapter 2 explains the basic elements HyperCard, the authoring program software. Chapter 3 discusses different ways to structure a HyperCard program along with some of the pros and cons of those structures. Next, Chapter 4 looks at various ways that hypermedia and television take the user and viewer into account during program development. Chapter 5 examines and compares with

television the different elements of design style included in the hypermedia program created for this thesis.

The next section moves away from program layout and style development and explores some of the resolution, technical and production considerations and restrictions that exist in the two media. Chapter 7 compares and contrasts the role of sound use in hypermedia and television. Continuing in this vein, Chapter 8 looks at transitions, both special visual effects, and various sound effects.

Chapter 9 deals with the creation process. What comes after the major program elements have been decided, how they fit, and how they are put together? Chapter 10 presents a more personal and theoretical discussion, about the kind of feelings and perceptions the two media evoke from the user and the viewer. Finally, Chapter 11 presents the author's recommendations.

Throughout the body of the text, research questions that occurred along the way and would be interesting to study at a later date are also presented. These questions are highlighted to distinguish them from the body of the text. Answering the research questions is beyond the scope of this thesis–its goal is to pose them.

CHAPTER II

BASIC ELEMENTS OF HYPERCARD

In this chapter, the basic hypercard elements and their different uses are introduced. These elements include: stacks, fields, buttons, and cards. In addition, the role of typography, (text and graphics), in hypermedia and video is compared.

Basic Mechanics of HyperCard

HyperCard programs are organized into sections called stacks. If you think of HyperCard and it's components as a note card filing system, you will have an easier time visualizing how it works. Stacks are like tabbed dividers in a filing box. Within a stack you will find fields, buttons and cards.

Fields are like post-it notes on 3 x 5 cards. The tabbed sections can be arranged in any order: alphabetically, by subject, by age, etc. Buttons are like being able to ask someone to do something with the cards, such as find a particular one, or sort them in alphabetical order.

Cards can have textual, or graphic information, or a combination of the two. The written information on a card is usually in the form of a field. Fields come in all different styles and sizes, scrolling, rectangle and plain.

Fields present textual information on cards. The text can be in a variety of fonts and styles such as bold, outlined, shadowed or italic. Text can also come in different sizes. From very small to very big.

Role of Typography

The role that text and graphics play in the two media are very different. In television the use of text and graphics is limited by technical restrictions. In

video, text and graphics must have the correct aspect ratio, fit into the essential scanning area, and due to television's poor resolution and inability to pick up detail, be very simple. Furthermore, technical and aesthetic consideration must also be given to proper use of color, contrast and gray scale (Compesi and Sherriffs, 1985).

Yet, these same technical considerations and limitations that affect television do not apply to computers. Due to the precise control available with computers, which includes being able to easily control every letter–in terms of font, size, style and precise placement–anywhere on the screen, and the better resolution available on computer compared to television, typography, text and graphic elements play a greater role in hypermedia than in video. Television resolution allows for, at most, about 40 readable characters per line on a screen, compared to 80 or more on computer (Wurtzle, 1983).

In the hypermedia program designed for this thesis, typography and text were considered just as much a graphic element as drawings and illustrations were. In video, text is mainly used to identify the speaker.

In addition, because television is generally viewed from a distance, putting a lot of textual information makes it difficult for the viewer to read. Conversely, the distance between the user and the computer is much closer, making it easier to read (Crockford, 1990).

Altered Fonts

Compared to television, the art of typography and layout has wide use and impact in hypermedia. In hypermedia fonts can tremendously alter the look and feel of a program. For example, Courier, Geneva and Helvetica have a very clean look; other fonts like New York and Times are more classic styles, whereas Agua Mundo, Black Knight and Brussels are more ornate.

Text, Sound and Dialogue

In hypermedia text is used with voice-over sound. The user gets the same message in two different ways. In video when voice-over and text are used it is generally in an educational or instructional format, often keyed over a full, single color background screen with no graphics, only text.

Apple Computer, Inc. suggests one effective technique in hypermedia of presenting the text and the voice-overs is to break up the text and the voice into chunks, waiting for hypermedia media user interaction to continue (Apple Computer, Inc., 1989). Therefore the information is presented almost in a dialogue versus monologue form. The text can be presented in individual words, sentences or paragraphs.

The user can actively participate in hypermedia to get to all of the information. In video there is generally a continuous verbal dialogue or interaction, which the viewer watches and does not actively participate in when the dialogue starts and stops.

How do I look?

In hypermedia, the affect and tone of the textual message is just as important as the style of the graphic presentation. Text and graphics may be integrated - not just overlaid, but designed visually to work together. For example, text may be positioned to cover just a clouded portion of a graphic of the sky in the horizon. In contrast, video sometimes super imposes text, but otherwise does not usually integrate graphics, showing little concern for the aesthetic of how background video and superimposed text work together. In television as long as the text is legible, (Wurtzle, 1983), and does not cover a critical part of the video, then it is used.

Flipped Out Text

Since text is so much a part of hypermedia programs, designers are given many different ways to display text and to present text fields. They can be presented in such a way that the text can be be rotated or highlighted, or have borders enclosing it. As with most possibilities, these options add complexity as well as increasing options. Consistency in hypermedia is a conscious effort.

Pacing Limits

In hypermedia, the user is frequently allowed to control pacing. Even when the computer is in control of pacing, there is more flexibility than with video. There are pacing limitations based on CPU speed and authoring software within hypermedia; different computers can retrieve and access and store information faster than others (Poole, 1986). But still there is much more flexibility than with video. Hypermedia can slow things down, freeze, repeat, modify, and show text at the same time.

Buttons: Start/Stop

Another element found on individual HyperCard cards are buttons. A button is a "hot spot" on the screen which activates a script when it is clicked on. As Figure 1 shows, buttons can be scripted and told exactly what to do, almost like a videotape editor would program an editing machine.

In a video, the editor would program the machine to know where she wants the music to start, when she wants the music to tag up with the video, and when she wants the music to stop. A scripted HyperCard button can direct that same progression.

The same analogy is drawn if just visual cuts were desired. The script of one type of button tells the computer what order to bring up certain cards, how

long to wait before the next card is shown, whether special effects, like a dissolve will be used to transition between one card and another, whether there is accompanying audio, and when to start and stop the audio.

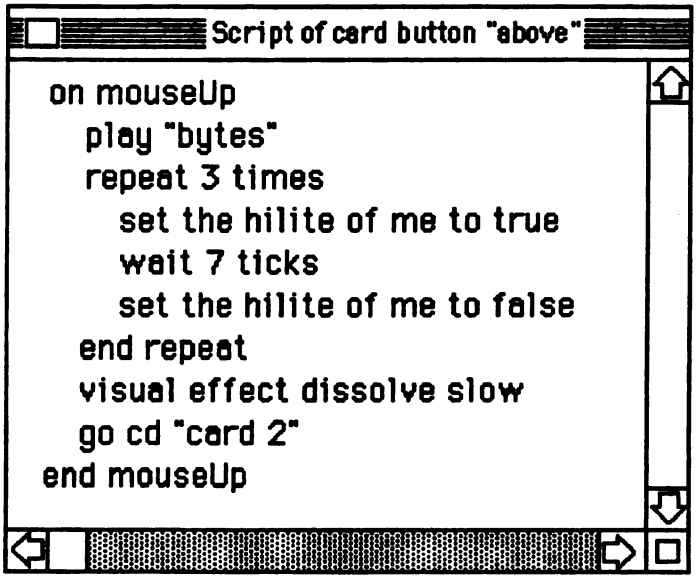

***Figure 1** Button script*

Where's the Button?

Buttons can also be scripted to show and hide things like themselves, or other buttons, or "pop up" text fields or requests for input from the user. They can compute simulations, control external devices like video disc players and much more (Goodman, 1990). Buttons can be represented by a graphic icon, a word or words, a combination of both or they can be invisible. No matter what it looks like, when the user clicks on a "hot spot" something will happen. For example, a sound may be heard, the user may go to another card or may even be transported to a different stack.

Navigational Buttons

The script of a button is activated when the user clicks the mouse on it. Buttons can instantaneously navigate the user around the stack. If the stacks are preprogrammed and linked together, a button, when clicked on, can jump the user to a card in an entirely different stack. Thus, buttons are very powerful transitional links within a stack and between stacks.

CHAPTER III

STACK STRUCTURE

In hyperCard hypermedia programs sequences of information are grouped together in "stacks". Stacks can have different structures and take on different functions. The following is a description of some possible stack formations and their potential uses and their advantages and disadvantages.

Linear / Non-Linear Stacks and the User

Stacks have different structures depending on their purpose, nature and presentation style. A stack can either have a linear, or a non-linear structure. A linear stack structure is set up so that every user goes through the same information on the cards in the same way, a straight line path.

Non-Linear Stacks: Path Structure

Conversely, non-linear stack structures are designed to allow the user to choose, via predetermined paths or branches, how they want to browse through the stack(s), or if they want to skip some branches or predetermined paths of a stack(s) entirely.

Non-linear hypermedia stacks, though not designed specifically to be individualized, can be used that way. Ten different people going through a non-linear stack might choose ten different routes to take. Therefore, if different paths are taken, all users may not get the same information.

RESEARCH QUESTION:

WOULD DIFFERENT USERS CHOOSE DIFFERENT PATHS?

Linear Stacks with Choice

Other stacks are hybrid. They can be set up so that each user goes linearly through all the information but in some sections of the stack are given a choice as to the order they want to branch off.

My Stack Design: Combination of Linear and Non-Linear Structure

The stack designed for this thesis was programmed to allow users to be exposed to all the same information, but had some choices about the order and pace. For example, in the program designed for this thesis, there are cards in which all of the users eventually get the same information, but they are given a choice as to the order which they click on different buttons and thus, how they navigate through the cards in the stack(s).

RESEARCH QUESTION:

WHEN PRESENTED WITH THE SAME 10 OPTIONS AND FORCED TO EVENTUALLY SELECT THEM ALL, TO WHAT EXTENT WOULD USERS CHOOSE THE SAME ORDER AND WILL THAT ORDER BE FROM LEFT TO RIGHT?

User Involvement

In the article, "Publishers, Multimedia, and Interactivity", Brunsman et al., suggest incorporating a selection of choice in hypermedia programs for a few reasons:

1. In hopes of keeping the user involved in the program

2. To give the user the feeling of control and being involved with the program.
3. Hopefully, having choices will keep the user's attention for a longer period of time and keep them motivated to continue (Brunsman et al., 1988).

In pure physiological terms, by moving their hands to click on the buttons, users are keeping their blood circulating. The circulation will keep the user alert, thinking and hopefully motivated to continue.

RESEARCH QUESTION:

HOW LONG WILL THIS PROGRAM KEEP A CHILD'S ATTENTION? DO THE INTERACTIVE SECTIONS ADD TO A CHILD'S MOTIVATION? DOES A CHILD'S LEVEL OF MOTIVATION AND ALERTNESS CORRELATE WITH THEIR UNDERSTANDING AND LEARNING OF THE PROGRAM?

RESEARCH QUESTION:

DOES TAKING AN ACTIVE ROLE AND INTERACTING WITH THE COMPUTER PROGRAM AND MAKING CHOICES KEEP THE USER'S ATTENTION AND/OR MOTIVATE THEM TO CONTINUE?

More Non-Linear Stack Designs

Non-linear stacks can be put together in many ways, depending on their purpose. For instance, a tree structure can be used for a tutorial chart. The stack would have one main card that had a text field that gave out instructions asking the user if they needed to review certain sections of material. Each section of review material would be covered by a separate stack. By clicking on a button

next to the section of material they needed to review the user would be transported to that section.

When they were through they would click on a button to take them back to the main card. Either they could go to another stack or quit the program. Thus, having a tree stack structure like this allows the user to pick and choose the appropriate stacks. This is a very efficient way to structure a stack.

Another, more free-form, non-linear structure is called a network structure. In this type of structure there is no hierarchical order, users just browse through the stacks. Buttons are set up they can easily go from one stack to another. A network structure is similar to an adventure game (Apple Computer, Inc., 1989).

Too Many Options Can Be Confusing

In a network stack structure, the user is given options about which path to take, and moves around the stack in a free form manner. Some network structures have cards that are home bases or like maps that assist with the options. Because the network structures have complex designs that offer many different route or path options to navigate through, they can be confusing and difficult for the user to use (Apple Computer, Inc. 1989).

RESEARCH QUESTION:

IS CONTROL AN IMPORTANT MOTIVATOR AND ENCOURAGER FOR THE USER? DOES IT MATTER THAT THEY HAVE AN ACTIVE ROLE AND ARE NOT JUST SITTING BACK WATCHING THE SEQUENCE OF EVENTS? IN A STUDY THAT LOOKS AT PACING OF PROGRAMS OR SEQUENCES OF SECTIONS OF THE LLRW HYPERMEDIA PROGRAM'S DISPOSAL OPTION STACKS, IT MAY BE FOUND THAT MOST OF THE USERS WOULD CHOOSE A PACE THAT IS SIMILAR TO THAT ON TELEVISION.

RESEARCH QUESTION:

BY CONTROLLING THE PACE THEMSELVES, IS THERE A CHANGE IN THE LEVEL OF SATISFACTION WITH THEMSELVES AND/OR WITH WHAT THEY ARE DOING?

RESEARCH QUESTION:

WHICH IS GOING TO GENERATE MORE LEARNING—A FREE FORM STACK STRUCTURE OR A MORE TASK ORIENTED STACK STRUCTURE LIKE MINE, OR ONE WITH NO CHOICE?

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CHAPTER IV

SECOND GUESSING USERS AND VIEWERS

This chapter compares and contrasts how the user and viewer are taken into consideration throughout the developmental stages of the project. For hypermedia, this includes presenting instructions, and review. In addition, the chapter presents the fact that most hypermedia elements such as buttons, fields and borders have a purpose. As well, the appearance of these elements in the program is very carefully timed.

Second Guessing the User In Hypermedia

Throughout the entire stack creation process much more time is spent in hypermedia, compared to producing a video and keeping the viewer in mind, trying to second guess what the user will think and do (Weyer, 1988). One level of consideration is trying to insure that the user has enough information to know how to operate the program. For example, when designing a stack for hypermedia, the producer has to consider whether or not the user will know to click on a button to continue, whether the user will know to move the mouse to a specific area for another effect or whether they have to be told (Gygi, 1990).

If they have to be told should, it be visual, verbal or both? When the user has to repeat certain actions will they have to be told every time what to do? Making sure the user knows what to do is an issue that recurs on almost every screen, at almost every movement. A second level of consideration is user understanding of program content and emotional and cognitive reactions to images sounds and words.

Second Guessing the Viewer in TV

In video, the viewer is primarily considered at the pre-production, development stage of production, when decisions are being made about who the target audience is, and other demographics. Thereafter, art or instinct dictates.

Rarely is the particular viewer kept in mind during actual production and post-production. If the viewer is kept in mind during these stages it is not as continuous or explicit as when creating hypermedia. In video, viewers are not as integral an element of the production thought process as users are in hypermedia. As far as viewers knowing what to do, mostly they simply press play on a VCR.

Instruction and Review

A video usually does not have instructions or review. However, hypermedia programs must constantly explain themselves. Some kind of instruction giving you direction appears on almost every screen. This could be in the form of an "OK" button, which continues a progression which had paused to await user input, or a field that has instructions, or a voice that begins when you open the stack or the card.

Instructions, Instructions and more Instructions

Hypermedia programs explain what to do all the time (Gygi, 1990). The hypermedia program designed for this thesis is full of instructions to help guide and engage the user. For example, in the below ground vault disposal option, there is a text field that says "To see the below ground vault, click on the drive button ." (See Figure 2) A video documentary may take time in the beginning to

explain what the program is about but need not offer help or instructions throughout the program.

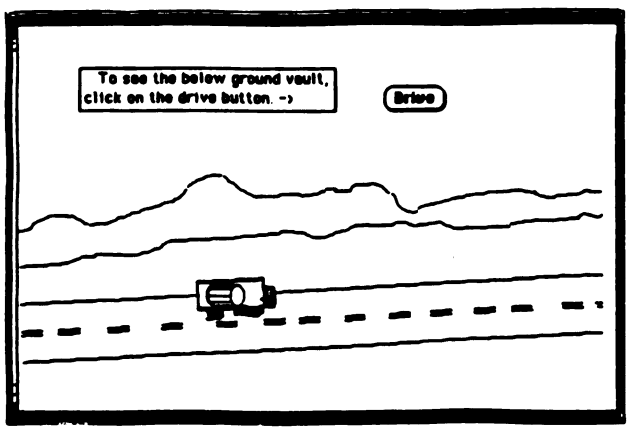

Figure 2 *A card from Below Ground Vault stack*

Interactive Summary and Review

To help users remember key points review cards were also designed. They are designed in a creative way that allows them to blend in with the style of the program. It is important for these cards not to stand out and say "I'm a review card and therefore I will be redundant and boring".

Hypermedia summary and review cards were difficult ideas and cards to come up with. How do you sum up a lot of information simply, make it look elegant graphically, emotionally appealing, not too complicated or lengthy and make it interesting and fun by having buttons that are interactive and provide immediate sound feedback once they are clicked on.

An example of an interactive review card in the LLRW program shows the user the pros/cons of the different disposal options and asks them which option they would choose and where in the United States they would put it. The card is designed so the user clicks on their chosen disposal option. This pops up

ratings of their chosen option on a scale relative to the other options. Three measures are compared: cost, accident rate, and manageability. (See Figure 3).

The pros and cons card was designed to be interactive. The buttons bring up different text fields that show how the disposal options compare to one another. The interactivity is designed to keep the user's interest, to motivate users to continue and to present the information as clearly as possible.

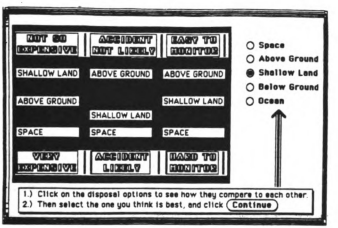

Figure 3 *Pros and Cons Review card from Intro stack*

Purpose in Design

While designing this stack it was apparent that everything needed to have purpose so the user's attention would be held. One reason might be that hypermedia program's are seen as a novelty and not given credibility or taken seriously as learning tools. In part based on this assumption, there is little room in the memory and on the disk for unnecessary information. Though there are time constraints for TV, 28:30 program length for broadcast, there does not seem to be as rigid a command from viewers about the program content.

One reason viewers may be more lenient is because they can get up and do things while the video is on or they can leave and come back again. A user

on the other hand, is required to be an active participant with the interactive hypermedia documentary. Thus, there is more pressure to hold the user's attention.

RESEARCH QUESTION:

IS THE USER'S ATTENTION AUTOMATICALLY HELD BECAUSE THEY ARE ACTIVELY INVOLVED?

All Buttons, Cards, Text, Fields and Borders Have a Purpose

According to Stephen Weyer, in his article "As We May Learn," to keep the user's attention it is not only important to entertain and engage the user but, it is just as important to keep the time length down, so the user does not get bored (Weyer, 1988). Thus, because the stack structure of the LLRW program was primarily linear, and had a lot of content to present, the length of the program, when a user used it, had to be kept as short as possible. This meant that all buttons, cards, text, fields or borders had purpose, those that were in just for fun and amusement were edited out. For example, in the early stages of the LLRW's program development the card sequences for the icon map (see Figure 4), were 2 to 5 cards long with a lot of extra sound and visual effects inserted just for fun. Yet to keep the overall experience from getting too long, these sequences were eventually pared down to one card (See Figure 5).

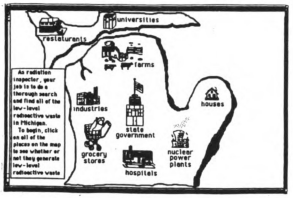

Figure 4 *Icon Map from Intro stack*

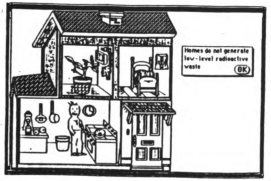

Figure 5 *Graphic for houses from Intro stack*

Putting in extra elements did not add to the scene, as might be the case in video. In video the reverse is true. It is common to purposefully put in "extra sound and visual elements into the setting to add realism and make it feel natural". These extra elements, in video, are mostly in the background and do not necessarily take up more of the viewer's time.

Keeping the User's Attention

As with all media, when putting the hypermedia program together the designer has to try to keep in mind the user's attention level, and consciously keep them from getting bored or frustrated (Apple Computer, Inc. 1990). If the flow of the program is repetitious, like the same sound effect heard over and over, you might lose the user's attention.

One strategy for maintaining interest is giving the user control over pacing of when and how quickly things happen throughout the program. For example, the "ok" buttons in the disposal options sections were purposefully placed and scripted so that the user could control when a sequence started and when they wanted to continue. The "ok" buttons were placed within the borders of the written narration text field in the lower right hand corner. (See Figure 6).

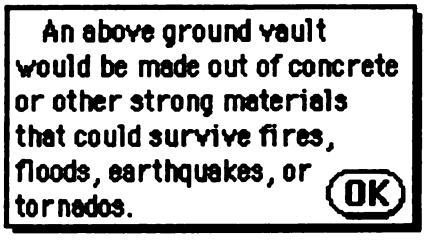

Figure 6 *Text field and "OK" button from Above Ground stack*

Approximately 1 second after the sound had finished, the "ok" buttons would pop-up. In addition, the "continue" and "more" buttons were scripted in a similar manner. These buttons would appear on the last card of a sequence approximately 1 second after the sound was done.

Tightly Timed

To prevent the user from prematurely clicking on the continue or "more" buttons and getting ahead of the program everything in hypermedia must be timed very precisely. For instance, if a "continue" button showed up before the program is ready to continue, the user might miss some of the sound from the

previous button's script. This would not be so bad if the sound were just a sound effect. However, some sounds are voice-overs giving important information.

CHAPTER V

STYLE

In hypermedia, creating a look and developing an appropriate style for your stack is very conscious and very important. The style of a program sets a tone. Considerations in the development of a style include not only the content and the target audience, but also borders, consistent use of buttons and fields, clip art, animation and issues regarding pixel control.

Designed for Children

Since the program developed for this thesis is primarily for children, the card's border and visual graphics took on a cartoonish look to disseminate the information, in a childlike and playful manner. An example of this childlike style are some of the animated sequences used in the disposal sections, and illustrated in Figures 7a, b, and c. In addition the sound effects played when certain cards were opened, the tone and quality of voice-over used in explanations and finally, the word choice for some of the text were also geared toward children. A frequent question in my head as I designed the program was whether a fifth grader, the target audience, would understand or be interested in this.

Different Style for Adults

On the other hand if the program were geared toward adults, the voice over sequences might still exist, but the tone of the voice would be more authoritative, and factlike than storylike. The script for the written text would be more scientific and in depth. However, the animated sequences would stay the same because my second guessing of the user is that their appeal spans the generations.

Figure 7a

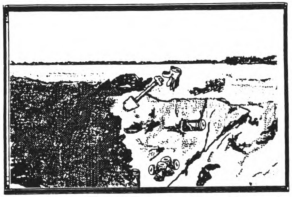

Figure 7b

Figure 7c

Figures 7a, b, and c *Animation sequence from shallow land burial*

Borders

Development of a segment involves creating the style and the feel of the program. This includes deciding what, if any, consistent border will be used. HyperCard cards are like blank sheets of paper. A consistent border is one technique for making an application hold together, and feel like an integrated experience as opposed to a compilation of distinct images. Borders can be a signature, a trademark.

The border designed for the low-level radioactive waste program went through 6 or 7 design changes before the final design was picked. The main reason for choosing the final border design was based on aesthetics. The final border design was not too bold, not too flimsy, the design did not call attention to itself and served the purpose of containing the screen image. It was also content-appropriate, consistent somehow with a radiation theme in it's unevenness and inconsistency and in its sparseness.

The borders that were ruled out were created before many of the graphics were created. It was difficult to visualize how the graphic elements would fit together without all of them there. The next step was to create a main card image for one section and design a border to go with that.

A main card image was created and each potential border was pasted into the design to see how well it fit. Some borders did not work because they were too thick and bold, others took up too much of the screen and called attention to themselves, others compartmentalized and separated different images on the screen, giving the appearance of a picture on the wall or a photograph in an old photo album, and still other borders appeared too flimsy and did not work visually to hold the graphic elements together.

Consistent Use of Buttons and Fields

The overall style of a hypermedia application also includes consistency in placement of different visual elements such as, what kind of buttons and fields will be used and how they will relate to the other graphical elements. Decisions were made about how to use and where to put buttons, and text fields on the cards.

Careful planning went into the layout, separating fields and buttons from the card's main graphic design. This let the entire graphic be seen and put the buttons and fields in plain sight, making it easy for the user to find them.

When possible, buttons and fields with similar functions were put in roughly the same location on every screen. Other alternatives would be to integrate text fields and buttons with the graphics, making them part of the scene, or to formally separate them off into a specific, formatted, on-screen "toolbox." The chosen method was a cross between the two - separated from picture elements, but not rigidly appearing in exactly the same place.

Another important element was consistency in the style and appearance of buttons and fields on all of the cards. Three types of buttons were used–round rectangles with a shadow, transparent, and stylized icons. Words framed by round rectangles suggest what the button will do. For example, the "continue" buttons used throughout the disposal option stacks. Transparent buttons, however were used over fields or graphics that presented information. These transparent buttons were programmed to highlight off for a specific number of times at a predetermined rate of speed. Their main purpose was to draw attention to whatever they covered. Finally, stylized icons were used as help guides throughout the program. An example of a stylized icon button is the glove icon that shows up throughout the LLRW program. (See Figure 8.)

Figure 8 *Icon glove used for stylized button*

Consistency of buttons also extends to choosing a feedback style - what happens when the user clicks a button. Using principles of sound feedback developed by the Comm Tech Lab, every button responds with some form of sound feedback before executing it's other commands (Heeter & Gomes, 1991).

Furthermore, the buttons throughout entire sections which have similar functions have the same sound. For example, all of the "OK" buttons within the icon map section make the same sound before returning the user to the map. More will be said about sound feedback later.

The style of fields and text were also carefully designed. All of the fields presenting instructions on how to use the software have a rectangular outline style text field and all of the informational text, which is also accompanied by voice over, has a shadowed outline style of text field. The shadowed rectangular outline text fields help them to stand out from the graphic. Maintaining this level of consistency in documentary videos does not take as much thought and work in producing documentary videos. Video documentaries usually either shoot real scenes or dramatize real scenes. Recording reality offers more natural consistency than constructed reality. Also in video, there is a larger selection of props that already exist in nature and do not have to be specially created pixel by pixel.

Clip Art

Clip art is loosely equivalent to stock footage - except that clip art can be modified and integrated into new scenes, while stock footage is more often used "intact." Clip art are various images from business graphics, to logos, to finely illustrated pictures of art.

Clip art is available commercially in books or on software. If in books, the images can be scanned onto disk and used in hypermedia programs. However, clip art is rarely consistent with the graphic style of an original hypermedia design, and most artists reject the use of "canned" images.

Animation

Hypermedia can include animation in several forms such as sequences that can be paralleled to motion sequences as seen on TV. One concern about user response to animated sequences in hypermedia is that users, familiar with television may have high expectations and compare the quality to television. On the other hand, most people's previous experience with computers has been text based, so hypermedia positively violates expectations for computers but negatively violates TV expectations.

RESEARCH QUESTION:

WILL THE USER, SUBCONSCIOUSLY OR CONSCIOUSLY, REACH AN UNDERSTANDING AND LEVEL OF ACCEPTANCE AND EVEN ENJOYMENT, THAT "YES, THIS WAS PRODUCED ON COMPUTER AND THE QUALITY IS NOT AS GOOD AS TV, BUT SINCE IT WAS PRODUCED ON AN ENTIRELY DIFFERENT MEDIUM, IT HAS A DIFFERENT FEEL THAN TV AND THEREFORE, IT IS ACCEPTABLE AND GOOD."?

Other Graphic Elements

The vast majority of visual content in hypermedia is static images–either graphics or scanned photos. Graphics and text use can be a combination of still or moving images grabbed from video and laying over static or animated text created on the computer. Television is the antithesis of hypermedia in this respect - almost every scene contains motion. Hypermedia developers can capture or scan existing images, they can create new images from "scratch", or they can combine and collage existing and new elements.

Though many photo images were scanned for this hypermedia project only a few were used, I considered the resolution too poor, 2 shades of gray, 72 DPI. This resolution is a limitation of HyperCard (Eckhardt, 1990). To include color, or 250 shades of gray, or 300 DPI one would have to have the photograph appear in a rectangle as a distinct, non-integrated graphic object. Thus, many developers find the 72 DPI images to be acceptable.

RESEARCH QUESTION:

MAYBE THESE IMAGES, WITH SOME ALTERATIONS, WOULD HAVE WORKED AND BEEN ACCEPTABLE TO THE USER.

RESEARCH QUESTION:

THERE IS A RANGE OF DISPLAY RESOLUTION AVAILABLE ON DIFFERNT PLATFORMS–HOW MUCH DIFFERNCE DOES IT MAKE TO USERS IF THE GRAPHICS ARE 2, 256, OR MILLIONS OF SHADES OF GRAY? WHAT DIFFERENCE DOES COLOR OR BLACK AND WHITE MAKE?

RESEARCH QUESTION:

DO VIEWERS ACCEPT THE LACK OF DETAIL IN SCANNED IMAGES OR SO THEY FEEL THAT THE IMAGES AREA OF LESSER QUALITY AND THEREFORE NOT AS GOOD? DOES IT COMMUNICATE LESS EFFECTIVELY? DOES IT AFFECT THE CREDIBILITY OF THE PACKAGE?

RESEARCH QUESTION:

THE USE OF STILLS IN HYPERMEDIA EVOLVES FROM IT BEING VERY DIFFICULT TO INCLUDE MOTION. WILL THIS PERSIST AS HARDWARE AND SOFTWARE IMPROVE? IS IT THE OPTIMAL WAY TO PRESENT?

RESEARCH QUESTION:

HOW WILL "QUICKTIME," A NEW COMPONENT OF THE MACINTOSH OPERATING SYSTEM THAT ALLOWS ANY MACINTOSH TO SHOW MOTION VIDEO AT 15 FRAMES PER SECOND, AFFECT THE USE OF INCORPORATING STILLS INTO HYPERMEDIA PROGRAMS?

Pixel Control

The hypermedia producer has complete control over everything on the screen down to the last pixel on the card (Poole, 1989). The hypermedia producer decides everything. The video producer has control over the scene up to a certain point. For instance, if the video producer is shooting the scene about outer space disposal of radioactive waste, covering a NASA rocket lift off, they can choose camera angle and moment to record, but they do not have control over the speed of the lift off, the background, the spectators, etc. But, in a hypermedia animation, all graphic elements can be manipulated–from the smile on a spectator's face to the intensity of flames when the engines first ignite.

CHAPTER VI

TECHNICAL RESTRICTIONS

Before issues of sound are presented, it is important to explore some of the current technical restrictions of computers which result in limited use of animation and motion in hypermedia. Hypermedia developers are faced with limited disk and memory space. This is especially problematic on some of the internal hard drives of low end, low powered computers (Apple Computers, Inc., 1989).

These technical restrictions impede the ability of developers to create and store and play long, smooth running, animations (Poole, 1989). Limited disk and memory space creates a big difference in how hypermedia programs incorporate sound and animation compared to video.

In addition, due to the technical differences between the two media, challenges are presented when trying to integrate one medium with the other. Though an indepth look into these differences is beyond the scope of this thesis, some of the basic differences will be discussed.

Technical Considerations with Video and Hypermedia

In video, there is no memory device that says "were getting to full I can't hold any more", video's capacity restriction is created by length of tape not width of storage capacity. When looking at "storage capacity", it is almost as if video, once again, comes out linear.

In a video program the amount of audio and video can be many, many layers thick, but only so long in length. Though it is true some VHS tapes can be used to play at different speeds and lengths, but to play longer, the tape is stretched, the quality goes down, and the chance for damaging, or "tearing" a

thinner video tape are greater than damaging a thicker video tape. Video tape allows the producer to put almost any kind and any amount of information on as long as it doesn't go over a certain length.

Computers on the other hand, also have a storage restriction, and some problem calling up sound and motion. Yet, despite the current memory and disk storage restrictions, computers do not have the time length restrictions as placed on video. There is almost no relationship between storage space needed for a hypermedia element and the amount of time a user eventually spends with that element.

Additionally, users, can access hypermedia programs at virtually any point in the program and go "forward" or "backward" (Anderson, 1989). Though, viewers, if they have their own machines, can access a video at any point, viewers cannot start a program in the middle and go back ward.

To create and store graphics, animation and sound, computers need enough memory and disk space. Use of graphics, sound and animation in hypermedia, demand that the computer have enough memory to call up the graphics and play the animation at the correct speed (Apple Computer, Inc., 1990).

Currently, hypermedia animated sequences with sound and graphics may play at different speeds depending on the type of computer and how fast it is. The timing of an animated hypermedia program developed on one type of computer may vary on a faster or slower computer (Bove and Rhodes, 1989). However, "QuickTime", Apple's new operating system addition, should solve this (Apple Computer, Inc., 1991). Yet, regardless of the tape format used to record or play a video program, it will always have the same timing.

"If 'ever' the 'twain shall meet"

Though getting too indepth in the technical differences that keep the two media from seamlessly merging, is beyond the scope of this thesis, a brief discussion is appropriate. To date the scanning systems for computer and television are different, though hopefully this will change to allow for seamless integration between the two media. Computers have a sequential scanning system, which sees images in sequential units. Television has an interlace scanning system that consists of alternating fields of even lines and odd lines. Each television image is actually a combination of two halves of the same image.

So, when there is an effort to integrate the two media there is a loss in quality, due not only, as mentioned earlier, to differences in monitor resolution, but also because of the different scanning systems. It is very difficult for a hypermedia producer to treat individual frames of video as discrete units of information as found in a computer program (Crockford, 1990).

Another area to mention briefly, addresses how the medias deal with the issue of color when one medium incorporates the other. Most color televisions have the luminance and color information on one composite signal. Computers do not. Computers have an RGB system.

An RGB system separates the color and allows computers to display more colors than television. When an attempt is made to encode these colors into a composite television signal there can be problems. Usually, because of the differences in the number of colors used in a computer-generated image, there is a loss of detail when computer-generated images are used on television. In addition, lines that are only a single pixel wide flicker when transferred to video–they appear only in one field (odd or even), not both, of the video frame.

CHAPTER VII

SOUND IN HYPERMEDIA AND TELEVISION

In some ways use of sound in hypermedia and video is the same. For example, both use sound for narrative purposes. However, there are some dramatic differences. This chapter reveals some of the similarities as well as some of the differences. Topics include, sound use in both media, representational sounds and transitions in hypermedia, sound as part of content not transition, feedback sounds, video's use of sound as a wall, television as a visual medium, and the quality of sound in video and hypermedia.

Sound Use in Hypermedia and Television

A video or hypermedia program is not complete unless there is sound. The major difference is that in video, sound is used as a limitless, continuous entity. In hypermedia, sound is a non-continuous entity, shorter chunks of sound are used in very controlled and appropriate places.

In both mediums, sound can be used with or without, graphics, still images or full motion sequences. The role of sound in hypermedia and video includes use as a transition, as part of the actual program content, use as a sound effect, and, as previously mentioned, for hypermedia in particular, as a form of feedback or reinforcement.

Using sound as a transition is a very helpful technique for both mediums when trying to save time. For example, if a video were to have a scene of a geologist looking over site characteristics in an office, and the next scene showed the geologist working out in the field, the sound that was heard might be of machines and sounds of workers in the field, while the shot is still of the geologist working in their office. After a few seconds, the camera cuts to the field

without having to show the worker leaving, driving to the field and starting their field work. All of that information was taken care of with a few seconds of sound.

Sound used as a transition in hypermedia is exemplified in the Space disposal segment of this thesis. After clicking a button to continue, a sound is used in conjunction with graphics to launch the rocket into space without illustrating every step involved. This visual and aural transition was needed to make a smooth transition from the launch pad into space.

Though the same exact idea is not used in the two examples, the hypermedia program does use a similar, time saving technique. As with video, editing motion sequences, hypermedia programs, through the use of sounds, can omit or group actions.

Other uses of sounds as transitions in hypermedia are to accompany the sound with a visual transition. For example, in the program when the user returns to the icon map a visual and audio transition is made. For consistency's sake, both the sound and video transitions that take the user back to the icon map stay the same.

Representational Sounds and Transitions in Hypermedia

In the LLRW program, different pictures on the icon map have different representational, sounds. The purpose was to send a non-verbal message to the user that they are going back to the icon map. The principles of correct usage of sounds in television are also applied to HyperCard. For example, having the sound effect last about the same amount of time as the visual transition, and starting the sound just before the visual transition starts and fades out after the visual transition is over.

Sounds as Part of Content, not Transition, in Hypermedia

There are times when sound is part of the hypermedia's program's content and not a transitional effect. For example, when the user is browsing through the above ground vault disposal option and clicks the "?" button, (see Figure 9), spoken information about that card will start to play.

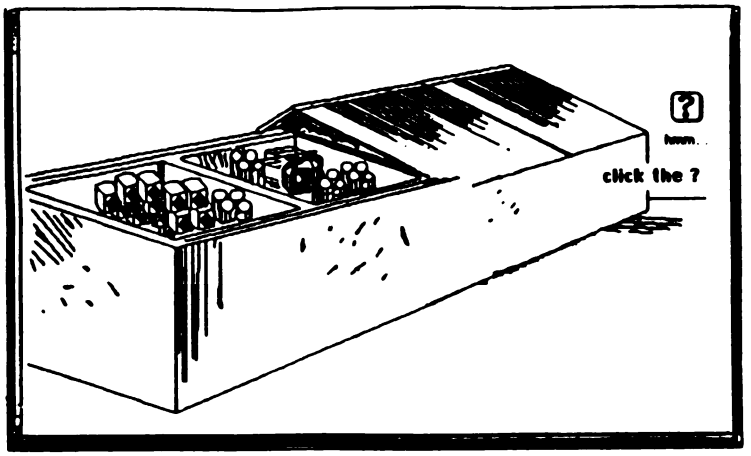

Figure 9 "?" button from Above Ground Vault stack

Sounds as Feedback in Hypermedia

Sounds are also used in hypermedia to give feedback, an audio response when the user clicks it. There are several levels of feedback: "yes, you clicked, I'm working on it"; providing more information; and setting a mood. This is illustrated when the user clicks on icon buttons on the map that locates actual generators of low-level radioactive waste. They hear an eerie type sound that represents radioactivity. The pictures of places (see Figure 11), that do not generate radioactive waste make a more neutral sound. It is a subtle reinforcement of the point.

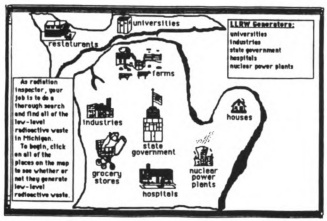

Figure 10 *Icon map card with actual generators listed.*

Sound effects in video documentaries are very rare, but in hypermedia they are an integral part of the program. In some designs, including those advocated by The Comm Tech Lab, the user is getting constant sound feedback (Heeter and Gomes, 1991). The choice of sound effect is also linked to pace.

In the space disposal sequence, different tempos are used with the different actions that are being shown. A slower, "heavier" sound effect is used when the rocket blasts off into space. Conversely, when the space sequence gets to the part where radiation falls to earth, a higher pitched, "quicker" sound effect is used. As the feel of the action decreases in weight and becomes lighter, the accompanying sound, pace and tempo also change appropriately.

All in all, the principles of correct usage of sounds in television are also applied to hypermedia. For example, having the sound effect last about the same amount of time as the visual transition, and starting the sound just before the visual transition starts and fades out just after the visual transition is over. Sound effects in hypermedia can also act as an energy source to enhance illusions–often carry the illusion more then in TV.

In the LLRW's shallow land section, the user clicks on a button to start covering up the shallow landfill. The sound effects that accompany this

animation seem to provide energy for, and play an active role in "covering up " the landfill.

Video's Wall of Sound

In video, sound is like a constant wall, almost like white noise. Television documentaries are never silent. They would seem unreal if they were. Soap operas have silence and they seem weird and unnatural. In documentaries either there is dialogue, ambient sound or music. Sound is a very integral structural factor of television (Zettl, 1973). Sound, or some kind of ambiance, or "room noise", even if it is "silence", is constantly around us in our daily lives. Since documentary television tries to imitate life and reality, it makes sense that television is never silent and that sound is very vital to the program's message.

RESEARCH QUESTION:

WHAT WOULD HAPPEN IF TELEVISION USED MORE SILENCE? WOULD VIEWERS REACT NEGATIVELY OR POSITIVELY?

Television as a Visual Medium

Though television is thought of by some primarily as a visual medium, the audio portion plays a very important role. In fact the audio portion may play a greater role in relaying the message than the visual part. Because the visual is coming across in a low-definition resolution, the audio is needed to carry out the complete message. To support this point turn the sound off of your television set and try to follow what is going on. Even if the visual is broadcast in high resolution, HDTV, a talking head does not carry much content, while sound does. Hypermedia replaces a moving talking head with a still one...for now.

However, if you left the sound on and turned the brightness of the image down you would be able to follow along. Sound is very important to television. The role of sound in TV is to provide important information, to establish a mood or aesthetic feel to a scene. For example different types of music help create the emotions of the scene. Sound used in this way alerts the viewer to what is coming.

Finally, sound in television provides a constant undercurrent a continuity that structurally ties everything together. In television sound is an integral aesthetic entity not separate from the visuals. If we did not hear sound the content would appear empty. Sound fills the void in television that is created by silence.

Quality of Sound in Video and Hypermedia

Because sound in television is recorded at the same time the visuals are recorded, ambient noise is picked up at the same time. The video producer does not have much control over recording a true, "clean" sound. Yet, in hypermedia, sound can be totally controlled but tools used are crude and speaker quality is poor. It is possible to hook up regular stereo speakers to a Macintosh to amplify the sound.

CHAPTER VIII

TRANSITIONS

Along with similarities and differences in sounds, there are similarities and differences in the use of special visual effects used as transitions. This chapter looks at the different uses of special visual and sound effects. The chapter also explores the limits and differences of acceptability of unique visual and audio effects that exist in hypermedia and television.

Visual Special Effects and Visual Transitions in Hypermedia and Television

The purpose, use, and technical ability of visual special effects, and visual transitions are very similar in the two media. Television has more sophisticated special effects, but most of them are computer generated or digital video effects. The most unique special effect employed in the LLRW program, that would not be able to be reproduced in television, is the inverse dissolve technique used in the space disposal section to blast the rocket ship into space.

In general, the visual transitions used in the hypermedia program would be familiar to a video producer. They include: wipes, dissolves, zoom open, zoom close, iris open, iris close. Though hypermedia's special effects are similar to television they are not as sophisticated technically. The effects on television seem to have a cleaner, slicker appearance.

Limitations of Sound Effects and Special Effects use in Television

In television, there are certain unspoken and unwritten limits of what sound effects and special effects are allowed before the program waivers on the edge

of being referred to as being "bizarre" or "arty" and therefore discredited or not taken seriously.

But just as you do not want to overdo the use of special effects in television, the same holds true for hypermedia. The main difference between the two media is in the types of effects that are acceptable and that are within the guidelines of being standard.

Unusual Sound and Special Effects Accepted In Hypermedia

In hypermedia, the producer can create "unreal", fun or unusual sound effects to accompany buttons, and the user would probably consider it normal for hypermedia. In fact, the effects would probably grab their attention, but not because they violate expectations of the medium. Viewers are not used to these extra ordinary audio effects on video and would find them out of place.

If these same special visual or audio effects were produced in another medium, like television documentaries, they might be questioned or thought to be odd. One example is the invert dissolve sequence used in the space disposal option.

To simulate lift off into space, and to make the section more fun, an inverted dissolve sequence was used. The card sequence went from an image to the inverse of that image to the next card, to the inverse and so forth. This was a way to use an unusual special effect in an appropriate manner. Here, there was purpose to this unusual effect. The limits of acceptability of wild special effects are stretched to their limits and beyond in hypermedia. The main point is to be consistent.

RESEARCH QUESTION:

DO USERS CONSIDER STRANGE SOUND AND VISUAL EFFECTS NORMAL FOR HYPERMEDIA? DO USERS FIND WEIRD SPECIAL EFFECTS OUT OF PLACE FOR TV?

Links and Transitions in Television and Hypermedia

When we look at transitions and links we find that in television they usually are invisible and go unnoticed. Hypermedia takes a different approach. Sometimes the transition purposely draws attention to it self like when a button or field "pops up" and is accompanied by a sound.

Moreover, in hypermedia, the user usually has to do something for a transition to occur. For instance, the sounds used with the buttons when the user goes from card to card in a disposal option stack. Some of the buttons say "more" and start the sentence immediately after the user clicks them. Other buttons play a sound effect that is scripted with a visual effect, like a dissolve, that takes you to the next card.

CHAPTER IX

THE CREATION PROCESS

Though the format of the final program is very different in the two media, hypermedia and video share similar methods in the pre-production stage of creating their programs. For instance, producers in both mediums need to know who the viewers or users are, the subject matter, and the most appropriate method or style of presentation.

One shared technique is to create storyboards for video and hyperboards, such as "StoryCard" for hypermedia. Storyboards outline the visual story of a video, while hyperboards lay out the visual sequences as well as tie in button commands that when clicked on, navigate the client throughout the stacks (Cudlitz, 1989). Differences in the creation process exist mainly in the "production" and "post-production" stages. Differences also crop up in the program management area. For example, where copies are stored, the ease of making copies, and the quality of copies compared to the original. These seemingly trivial factors affect design process and outcomes quite dramatically. In the following sections the process of putting together a hypermedia program is compared to editing a video program.

The Rough Edit

When editing a television documentary, a rough edit is created. At this time the opening segment, or introduction is at least roughly timed out. This involves either laying down a rough of the actual audio and video information or just allotting the time slot. Then the next section is laid down. The video editor can not begin in the middle and jump around. In most cases, the video editor starts very close to the beginning and works to the end of the program.

Timing and Program Length Restrictions

If the video producer is unclear about the opening segment, they need to have a pretty good idea about the total time length of this section so they can forward the master tape to the time they want the next section to begin. If there are any major timing changes in the program they give themselves enough slack in the front end of the tape to back time the program.

In television, the total program, if it is to be broadcast, must be timed out exactly. Requirements regarding program length are preset based on FCC regulations. Television programs can not be changed in length. Editors can only revise and change existing audio and video segments with insert edits. Insert editing does not add more time but does allow changes to be made.

Creating Havoc

In TV, if a name change was needed, or a shot needed to be changed, after the show has been edited, the editor has to deal with rigid timing constraints to make the change or fill the hole. If a shot needed to be changed then other shots would be needed to fill the time gap and would need to be the right length of time. Thus, lengthening of a section in the middle of a TV program creates havoc. A change in video shot might also require a change in audio.

No More CHANGES!

In video, after the rough edit is done and pretty much during the rough edit, major changes usually occur sequentially in the order which they appear in the final program. Rarely does an editor back track to make major changes. In video editing it is very difficult to change one thing and not have that change affect other elements, and create a snowball effect. Modifying a finished TV show is

generally far more complex and interrelated than modifying a hypermedia program.

Hypermedia: No Particular Length

Hypermedia programs are not developed in a linear start-to- finish-fashion like videos. There are no standard timing or length requirements for hypermedia programs, in part because there is no distribution medium or fixed known audience. Unlike video, it is difficult to preplan the precise length of a hypermedia program. The producer does not know the length of a hypermedia segment or composite package until it is tried out. The more interactivity, the greater the variability in actual length with different users.

Where do I Begin? The Start of a Hypermedia Project

The development of a hypermedia program takes a very different route then editing a TV documentary program. Because hypermedia programs are not constructed in a linear fashion, there is no preset starting point. It does not matter whether one starts construction of a hypermedia program at the middle, the end, or the beginning. Generally, a hypermedia designer begins somewhere in the middle, with a prototype (Apple Computer, Inc., 1989).

Prototypes in Hypermedia

Putting together the first segment of a hypermedia program, a section of the program that includes the style of: graphics, borders, text, fields, buttons and sounds in the hypermedia project, winds up serving as a prototype upon which the design of all of the other segments will be based.

The prototype segment may eventually become the middle, the end or the beginning of the program. The order of the hypermedia program can change from the original plan as the design evolves.

How does it Work? Hypermedia Design and Testing

During hypermedia segment development, experimentation within a range of styles and functions occurs. The program is tested for how the styles work visually and technically, with users and other designs (Apple, Computer, Inc., 1989).

Making Structural Changes in Hypermedia

In hypermedia, major structural changes can happen any time and are relatively easy to make. Many adjustments to hypermedia elements like introducing or modifying sounds in hypermedia, can be easily done without affecting or changing other elements. For example, in the final stages of development of the LLRW program some text changes had to be made for the hypermedia program. It was very simple to change the text. No other production elements were affected.

You Added WHAT?

However, when other elements, such as the names and number of cards or buttons were changed in the LLRW program, this required more attention. All references to that object in the program element's script had to be adjusted. For example, when sequences were shortened, all references to buttons that were scripted to "pop-up" had to be deleted. If adjustments were not made, when the computer came to that part of the script, the computer would interrupt the

program and put up an error message. Video productions never interrupt viewers with error messages and refuse to continue.

As the program evolved, some of the state's went from being shaded to being unshaded. However, at the time, the "X" buttons were not deleted from those states. Because the "X" buttons were still scripted the computer thought they were still there. When the user tried to go to continue with the program the computer gave an audio feedback sound, along with a written message, asking where that "X" button was.

Where am I? What mode am I in?

There are very distinct modes of accessing hypermedia programs. One is the authoring mode, in which you can create actual programs. The other is the user mode, in which a user interacts with the program. These modes are distinct on the computer. One can, but should not author an entire program without ever experiencing it from the user perspective.

In television, even while "authoring", editors constantly and repeatedly experience the "user" or viewer mode. These modes are more of a subconscious state of mind which the video producer easily flows in and out of. In hypermedia, though, there are distinct differences between what it is like "to create" this program and what it is like to "experience" this program.

Program Management

Video and hypermedia provide very different ways of organizing and keeping track of program elements. Currently, visual elements for video are stored sequentially on video tape. This all will change with digital video. But for now, scenes are shot on tape and a log is made for each tape. The logs consist

of length of shot, and quality of shot: was it framed correctly, was it steady, was the exposure correct?

The audio, if recorded at the same time, is also described on that log. Audio can also be produced on audio tape, separate from video tape, or on a separate video tape that has a color and text indicator to cue the producer when the audio starts and what take it is. Hypermedia, on the other hand, does not store audio and video in the same section, nor use logs to keep track of video and audio.

In the LLRW hypermedia program, sounds were created, named and stored separately from the other program elements such as graphics and text. However, by programming their name in to the computer program, these sounds could be easily accessed. An informal system of writing the names of the sounds down was used to keep track of the names of the sounds and what cards they go to. as changes came up in the graphics or animated sequences, changes were also made in the narrations or sounds. In video, protocol seems to be that images follow words, in hypermedia words follow images.

In hypermedia, after the general idea and storyboard is laid out, you create as you go. Whereas, with video, you storyboard, shoot, log and then make decisions based on the log. Because it has been around longer, video has a more formal system set up of how to manage a project than hypermedia.

Backups, Backups and More Backups

A major difference between management of hypermedia and video documentary is during the creation process. In hypermedia, backups of the program are made every day and stored on separate disks. If something happens to one copy there is always a backup. Since every backup is the same quality as the original, there is no generation loss as is true with video.

HOW Many Copies Would You Like?

The ease of making copies of a hypermedia project and knowing they are the same quality make it convenient to give to others to review and make comments or changes right on the program. The portability and accessibility of this medium is very easy. In hypermedia many people can have many copies of the same version, same quality of a particular work in progress. In video, however, this is not the case.

Generation Loss

With video, every time a tape is copied you lose a generation. There is only one almost perfect copy, the original edited master, and even that is second generation. Conversely, copies of hypermedia programs are totally revisable and they never lose a generation. The quality of a hypermedia program stays the same copy after copy.

RESEARCH QUESTION:

DOES THIS MEAN THAT HYPERMEDIA PROGRAMS SHOULD BE "BETTER" BECAUSE THEY ARE TOTALLY REVISABLE AND DESIGNERS GET AS MANY CHANCES AS THEY NEED TO GET IT RIGHT?

CHAPTER X

CONSCIOUSNESS AND REALITY

This chapter posits that hypermedia consciously incorporates certain elements into the program, and gives them meaning, where video does not. In addition, it compares and contrasts hypermedia and video from a personal theoretical perspective regarding how both media make the author feel.

Conscious Thought and Meaning in Hypermedia

In hypermedia, there is conscious meaning given to all the production elements created. The glove is used throughout the program as a familiar, recognizable guide for the user. When clicked on the glove carries out an action. Either a sound is heard or a visual effect occurs or a combination of the two. On the Icon Map screen when the users click on potential generators of low-level radioactive waste, their choice, if correct, is reinforced with a positive sound. If incorrect, they hear a negative sounding sound.

Another example of conscious meaning, is on the "Actual Generators" card. The point of this card is to collect the radiation from the actual generators and put it into a truck. When users click on different buttons of images representing actual low-level radioactive waste generators an eerie, ominous sound is heard. (See Figure 11).

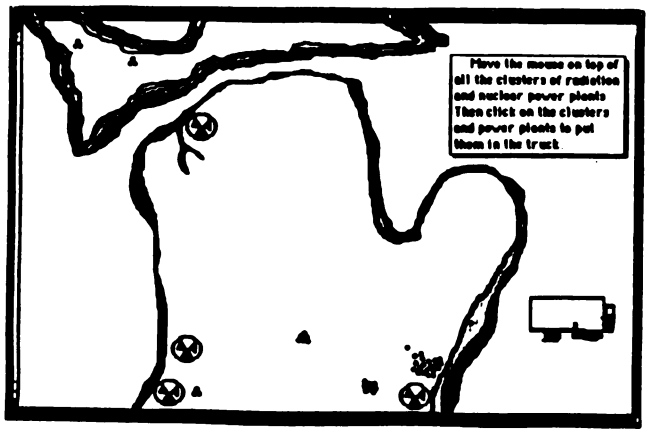

Figure 11 *Actual generators card from Intro stack*

Hypermedia's "Extra Sensory Perceptions"

There is much more opportunity for expression and enthusiasm to come out in a hypermedia program than in a television documentary. An effective use of the computer's uniqueness is to have the user's interactions with the computer be something that can not be replicated in the real world. For example, the pop up fields and buttons on the "pros and cons" card in Figure 2.

This use of the computer's unique ability for expression is very different from what we expect from television and presents a very vital "living" arena with sounds and special effects not heard and experienced in ordinary, everyday life. Yet, despite hypermedia's ability to share a wide range of sensory experiences, computers cannot express a feeling of warmth.

The "Reality" of It All

No matter how hard a hypermedia producer tries, and maybe they should not, there is no way to produce a "real" experience on computer, as achieved an television documentaries, and expect the same connection between the user and the hypermedia program.

One reason it is very difficult for a computer to relay human emotion is that there is always something on the screen, such as a "pop-up" field or button, that says "I'm different," "I'm a new technology." The computer is more of a tactical, sensory experiential medium than television.

Television programs on the other hand, in particular documentaries, try to present topics that reflect what we know in our natural world and touch on human emotion(s); making a connection with the viewer. Because viewers passively watch television, versus actively participating in a hypermedia program, there is more time to let the television program's message sink in and for an emotional connection to develop. However, in hypermedia programs, users are caught up in thinking about what they are to do rather than relating to what they just saw.

RESEARCH QUESTION:

DO VIEWERS AGREE THAT REGARDLESS OF HOW HARD A HYPERMEDIA PRODUCER TRIES, THERE IS NO WAY TO PRODUCE A "REAL" EXPERIENCE ON COMPUTER? DO USERS AGREE WITH THIS? IS THERE A DIFFERENCE BETWEEN HOW USERS AND VIEWERS RESPOND? IF SO, WHAT ARE THE MAJOR DIFFERENCES?

What Does It FEEL Like?

Comparing the "feel" of a video documentary to the "feel" of a hypermedia program is similar to the feeling of walking into a comfortable home–with lots of wood furniture, that is simple (Shaker style), and that of a new modern home filled with angular furniture, like high tech design museum quality furniture, which is interesting, but does not lend itself to being touched.

The irony is that hypermedia programs, especially touch screen programs, lend themselves to much more user interaction and actual tactile connection than video programs. Video does not offer this range of sensory experience. The viewer does not directly interact with the television program in a tactile way.

CHAPTER XI

RECOMMENDATIONS

This chapter offers the author's recommendations based on first hand producing experience in both media, and synthesizes conclusions drawn from other studies.

The Task at Hand

Whichever medium you choose, the object is to make the program, and the production elements that happen within, appear seamless. It is important for a person, whether a viewer or a user to have an experience and not be constantly reminded of the vehicle providing this opportunity.

For good quality integration of the two media there needs to be technical advancements in both media. Television's future for integrating and being fully compatible with computers involves a non-interlaced system, a digital encoded system versus analog, a component versus composite monitor, and to make synchronization accurate, a frame rate that is a whole number of 60 fps instead of 59.94 fps.

Technological changes for the computer industry are different. Though currently it is cost prohibitve to expect to see broadcast-quality video on computer, the hypermedia producer needs to continually demand higher quality hardware and software for "desktop video" productions.

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