

STRUCTURING
STRUCTURING

INFORMATION
INFORMATION

FOR
FOR

MULTIMEDIA
MULTIMEDIA

Structuring Information for Multimedia

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PROJECT BY

KAMLESH SAXENA

96625009vc

Special Project

Structuring Information for Multimedia

guide

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project by

kamlesh saxena

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Structuring
Information

for
Multimedia

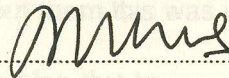
Approval

This Special project entitled

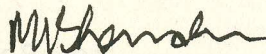
' Structuring Information for Multimedia'

is here by approved as partial fulfillment for the degree
of Master of Design.

Guide :



Internal Examiner -1 :



Internal Examiner -2 :

I am very grateful to my guide Ravi Poovaiah for his proper guidance and suggestions, and also for giving his research paper - "Construction of Interface For Interactive Multimedia".

I would like to thank Prof. N. Sadhu and Prof. M. Bhandari for their kind cooperation and help.

I would also like to thank my classmates, Ram, Manu, Bapu, Rina, Shilpi, Shailu, Raj and Prasad for helping me; without them this was impossible for me to do.

thanks are also due to -

Apple Computers Inc., Website on Human Computer;
Communication Arts;
I.D., Interactive Media Design Review;
Interactive CD-ROM, Academy of Art College;
Interactive Story Book;
www.yahoo.com;
www.commart.com;
www.academyart.edu;

Objective of the work

Exploring various levels and the surface of the information in multimedia, by linking information through pathways and organising it within a basic structure, it is possible to put it to better use and build a convenient, simple & easy-to-interact **multimedia** :

Integrating various media together seamlessly facilitates effective use of Text, Graphics, Animation, Video, Audio through input and output devices makes for a better Multimedia.

**Distinctive features
multimedia**

Until now, the information contained in any media had a liner structure; i.e., it was not governed at the user's end but structured by the designer. What makes multimedia so different is that the entire information can be designed as per the user's need; i.e., On his request for a story, a message or an idea. The information is no longer linear as user has freedom of navigation, he can choose his own path. At the same time, the medium has excellent linking potential.

Construction of Interface

Presentation level

The Display on Comp

Interaction level

Humanisation of Product Environment

Transparency in Interaction

Multisensory Interaction

Quality of Interaction

Interaction Design

Interaction Activities

Interaction Devices

Linking level

Information linking through its content

Relating Information

Exploration of Information

Levels of Information

Path of information Linking

Organisation level

Environment for Information

Metaphoring the Information

Variety of Information

Sourcing level

Presentation level

The Display on Computer monitor

Mostly available information is in the form of text, image, or graphics. Which is influenced by the development in the technology. The use of information from other medias has to be seen in the context of the monitors, potentialities and limitations- its physical dimensions, resolution, viewing distance, etc. Presently, because of its hardware configuration interactive multimedia seems suitable as a individualised interactive system. The video monitor appear to be a common solution to all kind of situations. This means the presentation devices can be expected to be quite flexible in terms of its resolution, along with variable aspect ratios and may even be suited for each of the above mentioned spaces.

Interaction level

To interact with product, information processors being an integral part of multimedia. With basis for transformation being digitisation, it can now make for easier conversion, inputting transmission, receipt and manipulation of inputs from the different media.

The aim is to **make this interaction easy, simple, conveniently, familiar and friendly**- all these, of course being easier said than done.

Humanisation of Product Environment

* Interactive Products are capable of modifying their behaviour on the basis of some capable of modifying their behaviour on the basis of some external variable. The product can be designed to have the ability to understand and accept changes. All this can be thought of as a humanisation of the product environment that we make use of in our daily interaction.

Transparency in Interaction

Whenever people learn something sufficiently well, they cease to be aware of it and are able to focus beyond them onto new goals. Ex. reading and the art of writing or Driving.

We need to be concerned with the method and the quality of this interaction and ways to make this interaction as transparent as possible and not focus our attention on the devices that are required during such interactions.

Multisensory Interaction

It will also be possible to make use of many of our sensory preceptions very much in the manner in which we interact with the environment. Let us pause for a moment and try this out as an exercise : try to express yourself or introduce yourself in the following manner.

1. by means of actions without using any words.
2. by means of your ability to draw without using any text.
3. by means of sounds that you can produce without actually using any words.

Difficult as the task may seem in the beginning, one would be surprised by the amount of success that can be achieved in the above tasks. This means that we have the ability to abstract messages and to translate these into one or other modes of representations that are used by the different senses. In our daily interaction with others we communicate by using many of our senses, such as words, gestures, or even our sense of touch. Since there lies the possibility of one being able to interact with multimedia by a choice of touching, gesticulating, speaking, pointing, writing typing etc, designers involved with interactive multimedia have, therefore, to enhance the quality of interaction with the product. It will be necessary to develop the language that is best suited to communicate with each of these different sensory modes.

Quality of Interaction

Interactive multimedia seems to offer the means for the user to control the information transfer process, according to his pace and choice so as to dynamically interact with the knowledge base. User can interrupt, interrogate, repeat or pause, adjust the pace, scan, review, locate and modify the material according to their individual needs.

The same media is able to provide flexible access to information can also encourage interaction. The process of interacting with a multimedia application can be made into an exciting, memorable and beautiful experience. Even the process of learning can be conceived of being an enriching one. It is possible to make the interaction process interesting, curious, stimulative and pleasurable by incorporating devices of puzzles, surprises, challenges, queries, evaluation and reward. Excitement and entertainment seem to be some of the sustaining factors for these kind of interaction.

Interaction Design

User interact with the product in an interactive environment, which in its own turn communicates with the user in some way or the other. This interaction should lead to an understanding of the product.

The aim is to make the interactive multimedia environment respond in ways that are easier to grasp and understand. Interaction design would concern itself with the design of devices for operating a given multimedia environment.

Interaction Activities

If we look at the kind of functions that are essential for interaction, they seem to be those of being able to select information, of being able to modify the information and be able to respond in some of language. (such as voice to text input).

Interaction Devices

The means of interacting with information was at first through the use of text commands. These commands had to be recalled from memory when required for use. Later on text was being presented as buttons so that these would graphically denote their role as selectable items. Further developments included replacement of text commands with graphical images -popularly called icons.

To make the interaction interesting, the icons could be animated or coupled along with sound so that it became active and responded appropriately when a command is executed.

Linking level

The uniqueness of this new media viz its interactive access of information in terms of blocks of text, images or audio is made possible by means of electronic links. So the information that gets displayed one after another will depend entirely upon the choice of the link relationship. This makes possible for the user to interactively browse, explore and navigate through the knowledge bases. Since each frame may be connected to a number of other frames, the user can follow a great variety of paths through the given material.

Organisation level

The distinctiveness of this new media offers new possibilities. It is easy to imitate the old ones before the extent of the potentialities of interactive multimedia are fully realised. 'New media extends our sense of reality and it looks to its predecessor for language and conventions, referring and adopting its characteristics until its unique characteristics can be explored and codified. This means that interactive multimedia should be understood as a unique, separate medium in order to realise its potentials; this should be done by understanding the inherent codes and conventions and not by treating it as an extension of or replacement for other medias.

METAPHORING THE INFORMATION

One of the possible devices a designer could resort to is the use of metaphor, whose 'basic premise is the juxtaposition of familiar elements in unfamiliar ways, the connecting of ideas and things are not previously connected, to serve as the mechanism in order to constitute a new meaning and in turn to gain in expressiveness. The process and result of designing with the metaphor is that elements undergo a change in losing their familiar meaning and contexts and recombine to produce an entirely new knowledge' Below are mentioned a few models that could serve to organise information in a virtual environment.

- * as a layer - the display surface is treated as a two dimensional surface without any depth. Information can be organised in this as separate windows. The windows need not necessarily have a regular border and can be in the form of objects that are displayed. This has a similarity with that of a page from a book.
- * as active layers - information is displayed in many layers one above the other. It is possible to activate any one of the layers. There is no definite border for these layers and it takes the shape of the object that is being displayed.
- * as an extended surface - the physical surface of the display is extended virtually in planar dimensions. It is

as if one is looking at a part of a larger scenario. It would be possible to move along the surface and access the information.

*as enclosed space with virtual depth - it is possible to construct three dimensional spaces inside the display area. The information is accessible along these virtual spaces. This can be in the form of a path, walkway, building etc.

*as extended space with virtual depth - The information itself can be present in three dimensional virtual space but without any boundaries. One would be able to access this while moving around in this space.

Variety of Information

Interactive multimedia facilitates mixing up of information from a variety of sources- Video images, animation illustration, diagrams, still and moving text, spoken words, music and recorded sound. For example, the display of text on the screen can be followed by an animated diagram which dissolves into a realistic moving image, accompanied by audio sounds. The ability of the interactive multimedia to select information from a variety of the medias should be recognised as an important factor in the process of communication.

Constructing the Interface

The design process in the design of an interface, needs to be conceived as a physical activity in terms of a development across our sensory capabilities; as a relational process in terms of a linking between and across of information; as an organisation of its various elements in terms of an arrangement across space; and appropriate amalgamation of the various medias.

The synthesis of the characteristics of these variables define the syntax of an interface.

The Information

The Hypermedia Information Systems (HyIS) research concerning the effective development and deployment of hypertext and multimedia concepts, techniques, technologies and applications. Integrating hypertext or multimedia in an application alters and has the potential greatly to augment the way users comprehend the application domain and manipulate information. Instead of concentrating primarily on technological improvements, this report takes an information systems focus, promoting the effective use of concepts and technologies to support people, **processes and activities**. The studies the capacity of hypertext and multimedia to support both individuals and groups in scientific, engineering, business, educational and personal productivity domains.

Hypertext

Hypertext is the study of relationship management. Hypertext concerns both representing a corpus of information in a **non-linear network** and giving users access to relationships within a corpus of information. Hypertext functionality includes sophisticated navigation, annotation and information presentation. The term "hypermedia" concerns hypertext within multimedia environments.

Multimedia

Multimedia concerns the development, use, management and integration of various media forms, including **text, graphics, audio, video and animation**. Incorporating multiple media offers the opportunity to convey information more effectively than a single medium may provide.

Scope of the project

Integrating hypertext functionality and multimedia support into various types of information systems, such as document management, mathematical modeling, decision support systems, executive information systems, geographic information systems, **design** and **development** environments, **education** and **training**, database and multimedia database management systems, and knowledge-based and all systems developing hypertext functionality and multimedia support for cooperative work and group support environments dynamically determining relationships within an information corpus; automating **linking** and **navigation** support based on metaknowledge (e.g., application structure) and content analysis exploiting domain **structure** to support authoring hypertext and multimedia applications integrating multimedia into hypertext applications; integrating hypertext concepts into multiple media environments (e.g., applications incorporating video, virtual reality and augmented reality) developing systematic requirements analysis and design methodologies for hypertext and multimedia applications

The goal is to integrate various computational applications the processes controlling and interrelating them into a single overarching framework. A **hypertext engine** can be used as master scheme connecting individual scheme for each application. This bi-level scheme design enables the engine to track objects through computational transformations across applications and reports, allowing the reader to apply hypertext functionality (navigation, annotation and view-oriented operations) to any object or process in the entire system.

Extending the HTML language in a very principled and robust manner to add any new **data type** or **document-based** function (graphics, charting, versioning, etc.) to the HTML markup language can be of great help. Anyone will be able to define their own HTML extension using the outline. Researchers are developing a World Wide Web browser/editor that will be able to display any document written in this extended HTML format automatically.

Integrating Hypertext

into Information Systems through Dynamic Linking

The goal is to add hypertext features to computation (vs. display-oriented) information systems to improve their effectiveness and give users direct access to the interrelationships within applications. Developing a general hypertext data model specifically for this domain, GHMI. GHMI specifies and extends the well-known Dexter hypertext reference model to support computational systems, is needed. Applying this to relational database management systems, a data model will include a variety of structures for modeling information at various levels of detail.

The Hypermedia

Engine for Integrating Hypermedia into Computational Applications

This project investigates into the application of the concept of hypertext through a hypermedia engine into independent information systems. The engine should run concurrently with other applications and automatically gives them this hypermedia functionality. A major contribution of this work is automatically detecting the location of interrelationships in messages and documents based on a knowledge of the application's internal structure, and upon the current user and task. This may involve arbitrarily complex inference. The engine should dynamically infer which message and document contents have interrelationships, and automatically makes these into hypermedia "buttons". When the user selects one of these buttons, the engine then dynamically determines the available "links" to related application objects, appropriate application commands and any user-specified annotations, making all these accessible to the user. Our goal is for applications to utilize the hypermedia engine with minimal or no changes.

Hypertext as Secondary Support

Functionality

In analytic (computation-oriented) applications, display and other interface functionality is second in importance to the application's analytic capabilities. Many of these systems do not take advantage of hypertext techniques that give users direct access to application interrelationships. Hypertext features can provide supplemental support functionality, which augments both the application's user interface and computational components. In analytic applications designers often must integrate hypertext "into" the design of the system's computation and interface modules, instead of designing these modules "around" hypertext functionality. In this research the aim is to develop design guidelines and methodologies for providing hypertext as secondary support functionality.

Effect of Hypermedia

and Multimedia on Communication

This project analytically studies the logical foundations for representing and reasoning about people's actions and their effects upon others. A logical framework to model actions that affect the epistemic states of agents, as well as automated reasoning methods for applying the framework and drawing conclusions is to be studied. Communications play an important role in human actions. It is examined how different methods of computer-mediated communication, such as well as **hypertext structuring**, **multimedia** richness and natural language function as part of social activity performs. To apply this researchers are developing automated reasoning tools supporting collaborative decision making, and the process of software specification and development.

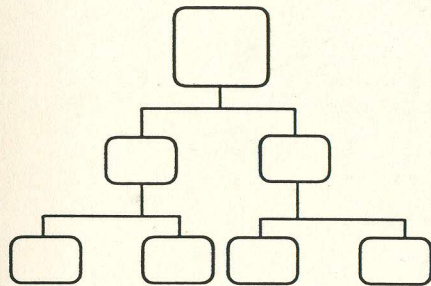
Virtual Reality, Hypertext and Multimedia

Virtual reality inherently includes multimedia. This project looks at applying multiple types of media and especially text to virtual reality environments. To date, very little research has been conducted on how people "read" information in virtual reality environments. Yet, even in virtual environments users will need to read annotations and other linked materials.

Therefore, in this project we also study how to represent interrelationships as links in a virtual reality environment, how users should select and follow them, and how users will process the information they find.

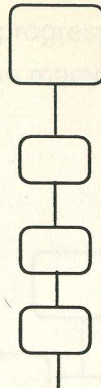
Multimedia Databases

This project studies the application of multimedia databases to information systems containing dynamically changing information. Exploring the special aspects of software engineering that best exploit multimedia databases also requires exploration of the use of multimedia databases to support non-textual hypermedia relationships.



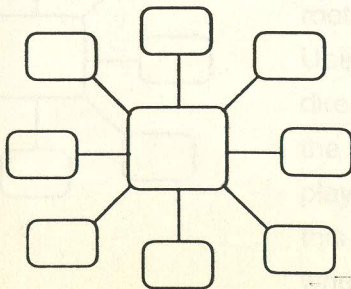
Linear Structure

Linked to another information
it can go at different levels.



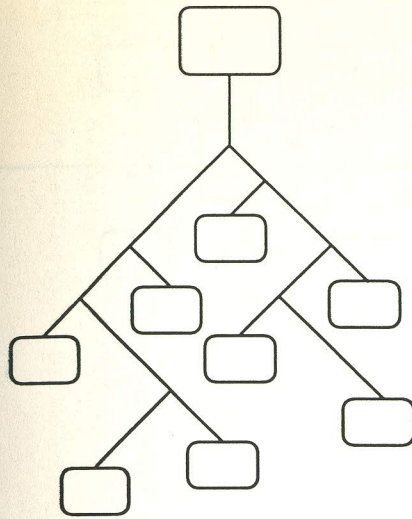
Branching Structure

Here information is linked
to more than one choice.
Brouser can access more than
one information at different levels.



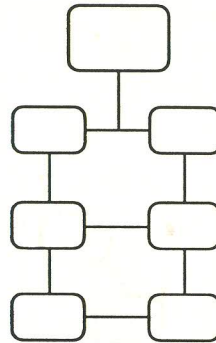
Uniting Structure

In this case information is linked
more than one combinations
to form another. It is suitable
for games, where any selection
will lead to one solution.



Tree Structure

In this kind of structuring the information is further branched out as it progresses down the levels, this can be used for story which has many ends.



Parallel Structure

In this case user can follow only one path across the levels or he can go across the information at every level. example multilingual access to information, or a very good example can be Cricket ball from different points of views

Players

Manufacturers

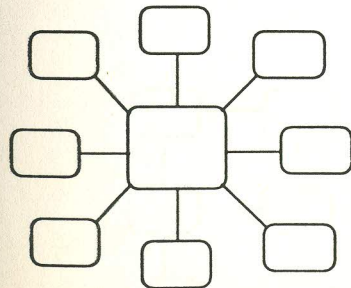
Spectators

and this can group into different levels--

Shape wise

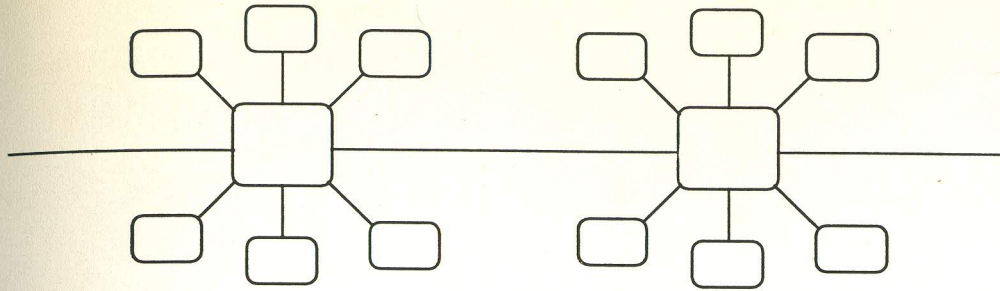
Material wise

Function wise



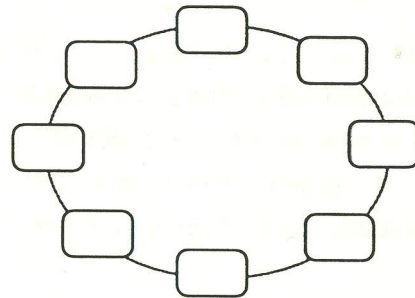
Single frame Structure

In this case the entire information is linked to the root, it also leads to well- categorised linking. User can access to any part of information directly; but every time he has to come back to the root. example- Fair-its a centre for all shops, playful things, giant wheel, merry-go-round etc. this is also fit for super market or mini print house where all print facility is available.



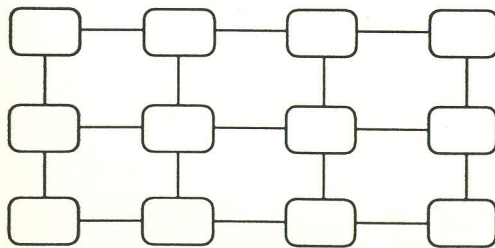
Node Structure

This is a combination of leaner and single frame node structure. This can be suit for bombay local railways.



Cyclic Structure

This type of structuring is connected in loops which leads further back to earlier stage. example - It is good for the ending of deep sub levels of multimedia, or at the end of any other structure.



Grid Structure

Here information is linked like a grid structure. User can also navigate across the categories of information at every level and vice versa.

Example- An information spread across the campus.
or path of a dog roaming around in the colony.

This CD-ROM show cases the result of the largest annual design competition for interactive media. To make this CD-ROM a valuable educational tool, many of the winning entries are reproduced as truly interactive experiences. Meant for viewing these award winning projects

1

This CD-ROM is organised into two areas:

The CA section contains the Introduction. The help, system and CA on-line, where you can access Communication Arts on-line at commarts.com.

The Annual section contains the winners, the jurors and the Index.

Short cuts-

Purpose to providing this for easy navigation through the Interactive design annual.

While playing CD how to control-

- Volume
- Animation +Intro.
- Direct play animation
- Skip
- Quit
- Return to main window.

Viewing pieces-

Strategic to do this is to navigate through the pieces with the help system. While navigating this allows to-

- Return to Winners
- About the piece
- see credits of piece
- Web piece inactive
- Help system is on.

This will also allow to jump to CA on-line, Intro, Quit.

Winners-

This is the main section for a browser to access all information from deep far levels of the CD. This part contains different category in the navigation strip.

Provides roll over the icons to view the name of the piece and image of it. Speaker icon to turn narration off and on and clicking on piece will play the piece other then this large icon also starts the piece.

Opening screen
(option skip)

Auto Intero.

Help

General
Winners
Index
Jurors
Viewing pieces
Short cuts

Detail
Help
Information

CA
on-line

Launch
CA
on-line

Open Location

Change
brouser to
default

Explorer/
file manage.

Index

A, _____
B, _____
C.....X, Y, Z

1, 2,.....14,15

1, 2,.....20,21

Detail part of
first company

Intro
Go
Return

Members
Search
Graphics
E-mail
Web Site

Annual

Jurors

Shelley evenson
Cecil juanarena
Peter seidler
Nathan shedreff
Lynda weinman

Video clip
Intro
Back
Play

Detail part of 1
Hallmark

Intro
Go
Return

Locator
Search
E-mail
Site

Perpetual Switch

Winners

Advertising
Business
Entertainment
Information
Self-promotion

1 2 3 4 5 6

1! 2! 3! 4! 5! 6!

11 22 33 44 55 66

Detail of 1!

Intro
Back
Go to
Play
Forward

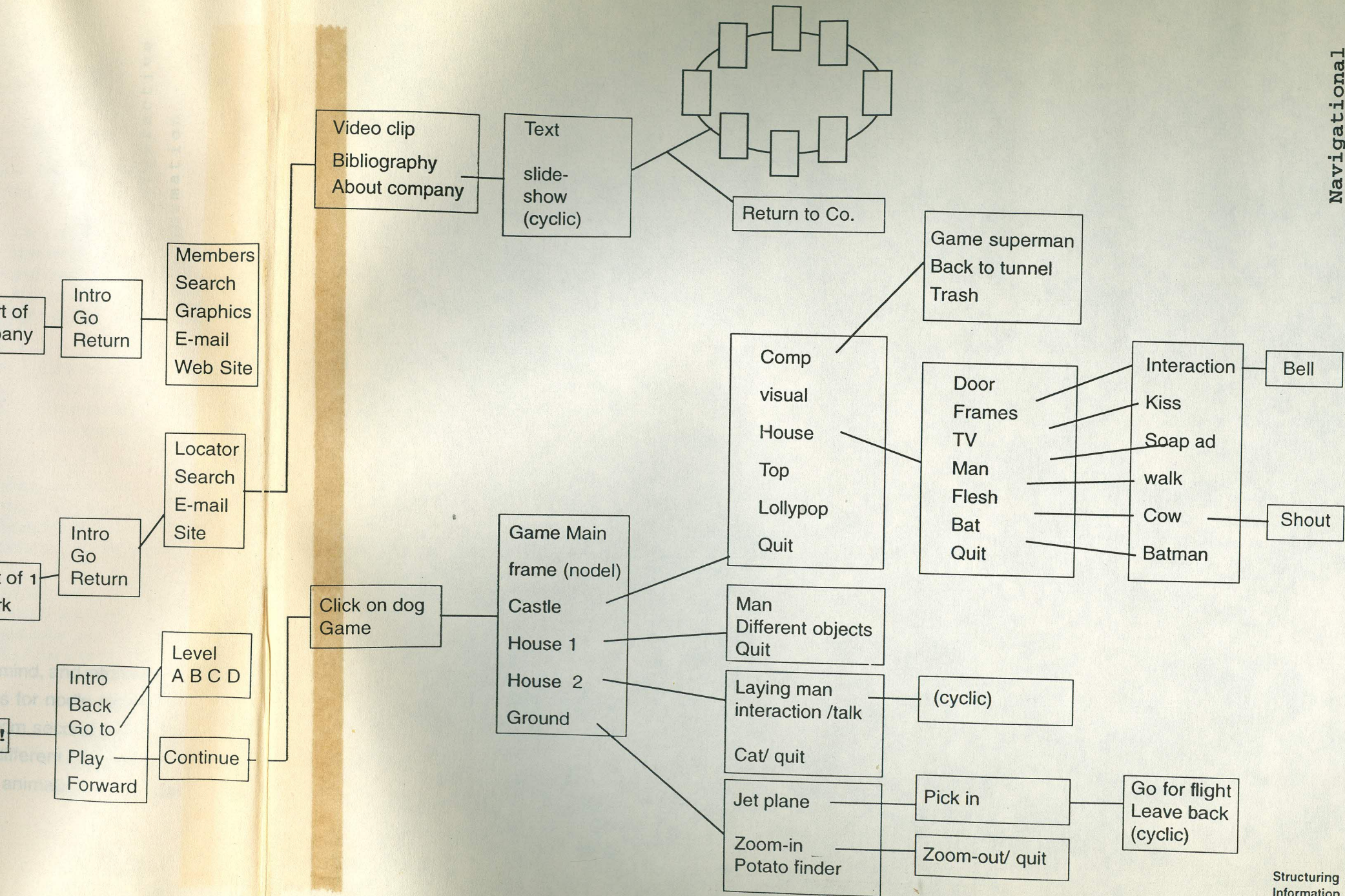
Level
A B C D

Continue

Back to winners

Cast members

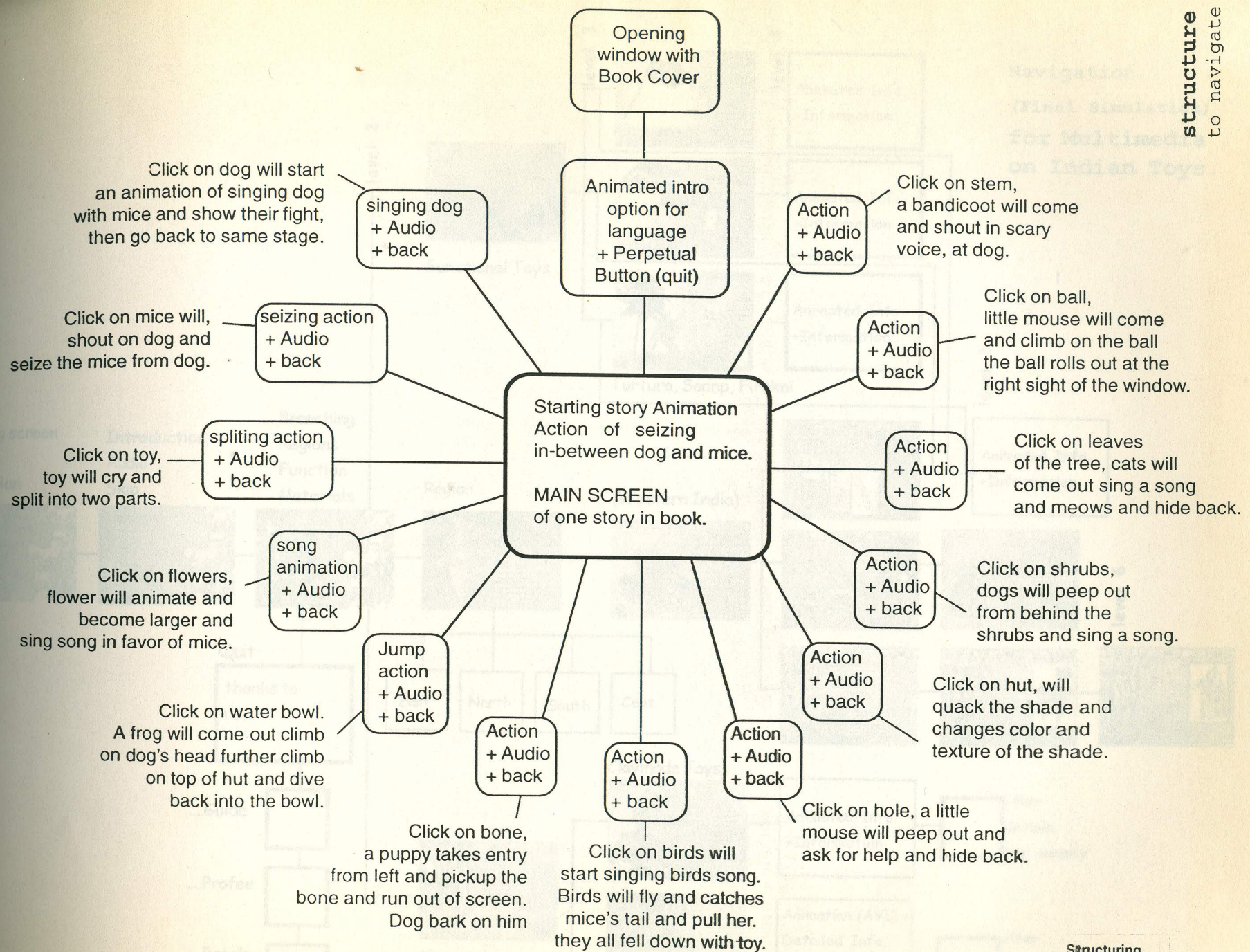
Quit



This CD contains interactive story book, based on interactive animation.

The idea goes like this-- First screen opens with a story book, an auto introduction will start with animation and shealla rey's voiceover and same time gives option to open the book. Inside each story is depicted through a visual which covers the complete visual of story. This screen gives so many options to navigate across through the story. Just by clicking on the characters and different parts of the picture will take to animation part and tells story.

This has done with keeping kids attitude in mind, and information is chunked into different parts so that suits for nodule structure. Here kids can access information direct from second level. On this level information is displayed through different characters to complete the story and this suits for the animation technique also.



level 1

opening screen
title
animation



Introduction
Audio
Skip



Branching
Regions
Function
Materials



Quit

thanks to
user &

....Guide

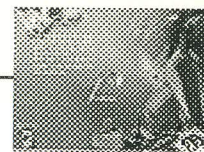
....Profee

....Batch
mate

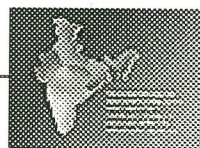


level 2

Functional Toys



Region

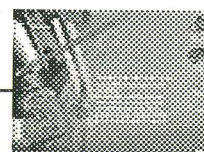


East

North

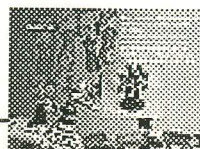
South

Cent.



Material

Claymade Toys



Wooden Toys

Animated Info
+Information

Animated Info
+Information

Animated Info
+Information

Turtura, Saanp, Firakni

level 5

Animated Info
+Information

level 6

Navigation
(Final Simulation)
for Multimedia
on Indian Toys.

Structuring
Information

for
Multimedia

Conclusion

This research concludes that, to achieve usability, functionality, information accessibility, in your product like interactive multimedia; have to have based on above written points. To maintain retention in the product the quality of imagery, the graphics, animated graphics, audio video input, and speech and music demands specific treatment, so that user can always able to retain the information. Text has same important role in delivering the information.

The navigation play the role to deliver appropriate information to the user, which is kept for use.

Now the Navigation Structure keep all information within structures, so that it should delivered when & where its required. Here combination of the different structures can be done to achieve the hi-quality of communication. All the combination of structures can solve the purpose of the kind of environment, information delivery, and the linking of information one after another, other then this the same structure will be helpfull to built games, quiz, a slide show, or a walkthrough, etc.

Nowadays there is a need of interactive multimedia to project the image of a company, or to project the importance of any product of a company, and so many other similler demands. Here in receiving the data and building a interactive multimedia as final product out of it, is a long journey which need all this research work which covers this report.

CD-ROM

Communication Arts,
410 Sierman Avenue, Palo Alto,
California 94306-1826
E-mail ca@commarts.com

I.D.
Interactive Media Design Review
Winners 1997
440, Park Avenue South, Floor 14,
New York, NY10016
E-mail IDMag@aol.com

Interactive Story Book
Animated stories for kids.

Interactive CD-ROM
ACADEMY OF ART COLLEGE
79 new montgomery street
san francisco, CA 94105
1.800.544.ARTS

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Vol 13, No. 6 Nov.-Dec. 1996, pp 317-322

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MPR- Apple Interface Principles/ Internet - 7April '97

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www.metacrawler.com/crawler?general=structuringmultimedia
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www.academyart.edu