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Template based Authoring for Cost Effective Multimedia Production

By

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Abstract:

National Multimedia Resource Center is sponsored by Ministry of Information Technology, Government of India and established in 1998 at C-DAC. The center is entrusted with the task to identify and propagate cost effective applications of multimedia among the masses. This paper is a documentation of research and experiments that went into the development of QuickMM Album Authoring Tool (Pre-authored Multimedia Template) designed to meet the above goal.

In India, multimedia technology is used largely by a monotypic class, which comprises of wealthy people and qualified IT professionals. The newly identified class of 'prospective' multimedia users comprises of people coming from diverse backgrounds and more precisely, the non-technical professionals. They do not use multimedia, as neither they afford the multimedia authoring software nor understand scripting lingo.

The project intends to seek solutions to the following:

1. Enabling the non-technical professionals to use multimedia
2. Identifying multimedia applications having mass appeal
3. Reducing the development time and production cost of multimedia applications

Looking at this scenario, the need for a simplified approach to multimedia authoring and content creation is strongly felt. Keeping this need in view, we have developed a software called QuickMM Album Author as a humble beginning in this direction. 'Album' is a metaphor used for conceiving the pre-authored template. The template offers a standard structure for content integration and navigation flow with some flexibility to allow customizing. It has predefined pockets for integrating various multimedia components. The tool is suitable for non-technical professionals and it enables them in delivering certain types of multimedia applications very efficiently. A collection of decorative designs of Indian culture called Shaili is developed which complements the features and applications of QuickMM Album Author. Both the tools are designed to form Low Cost Multimedia Enterprise Kit.

Introduction:

In India, Multimedia is not spreading beyond the affluent class of consumers and qualified developers due to lack of cost effectiveness, easy-to-use multimedia solutions and applications with mass appeal. The primary objective of this project is to propagate multimedia further down in the middle class society. Fifty years ago India's middle class was small and insignificant. Today, India's middle class is the largest in the world (Around 25% of India's total population), almost equal to the population of the United States (284 million). Proportion of trained multimedia professionals is meager to meet the multimedia needs of such a vast middle class population. Therefore, first action point is to identify applications with mass appeal and build solutions, which could be used by middle class users at affordable price. If properly supported by low cost multimedia templates, these users will be able to sustain small-scale multimedia enterprises.

Scope:

Figure 1.0 illustrated below aptly depicts the proportional relationship among the inter-dependent components, which influence the cost of a multimedia project, product and service.

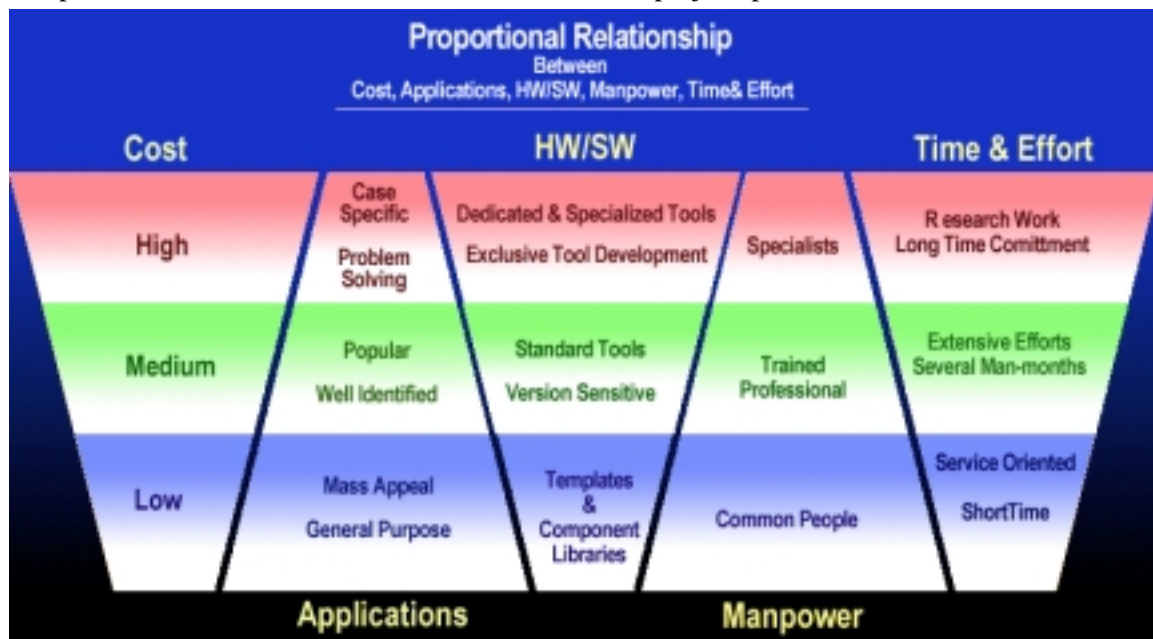


Figure 1.0 Identification of Scope for Low Cost Multimedia Solutions

The essence of the illustration is summarized as under-

1. Research & Development Applications: The case specific and problem solving type of multimedia applications can be implemented with the help of multimedia specialists. The process of development involves lot of explorations and research efforts. Dedicated HW and SW tools are required for effective performance. The development process is time consuming. The customers, however, are very rare for these applications. Resultantly, the R. & D. Projects become highly expensive. **Examples:** Multimedia applications for Defense such as War Gaming, Interactive VR Simulation of a War Ship, Restoration of Heritage Monuments, etc.

2. Multimedia Products: Applications designed for well-identified segment of customers receives attractive response in the market. Such applications are developed using standard software tools by multimedia professionals. This type of consumer-oriented projects are planned and implemented in a time bound manner. Products have to be sold in large quantities at an affordable price for recovering the development cost. **Examples:** Multimedia CD Titles on the topics like Encyclopedia, Children Stories and Computer Games, etc.

3. Service Oriented: There is tremendous potential for general-purpose applications of multimedia in India. This market has remained unexplored due to non-availability of cost effective and easy-to-use multimedia solutions. Multimedia experts are inadequate in number for fulfilling the needs of potential users. Further more, it is our experience, that the experts are reluctant to work on general-purpose applications. The non-technical professionals, therefore, must be enabled to develop the applications appealing to masses. They should be able to offer the services in a short time so as to reduce the production cost.

Prospective Users of Multimedia Templates and Possible Applications			
Sr. No.	Prospective Users	Applications	Customers
1.	Videographers	* Multimedia Albums of Family Events such as Marriages, Birthday Celebrations, Get-togethers etc. * Tour Albums * Photo, Picture Collections, * Portfolio Presentation * Multimedia Documentation of Corporate Events Foundation Day Celebrations, Product Launch Functions * Presentaion of Conference Proceedings * Multimedia Documentation of Exhibitions, Festivals etc.	* General Public * Institutions, Companies, Organizations * Exhibitors * Participants
2.	Photographers		
3.	Photo Lab Technicians		
4.	Secretarial Staff		
5.	Facilitators		
6.	Event Managers		

Figure 1.1 Prospective Users and Low Cost Multimedia Applications

Users Profile:

Scope for development of low cost multimedia solutions becomes visible at this point. Following characteristics are identified for profiling the prospective users:

Professionals who-

1. Create some of the multimedia contents such as photographs, videotapes etc.
2. Apply conventional methods for fulfilling the needs due to lack of exposure to multimedia.
3. Are aware of the multimedia technology but not choosing to use it because they may have to subcontract the job to experts.
4. Deal with multimedia contents but do not have an effective medium for presentation.
5. Are aware of multimedia technology but find it expensive and difficult to use.
6. Are not aware of multimedia technology but want to do some value addition to services.

In the light of above, some of the prospective users and applications are envisaged and short-listed as under.

While choosing the prospective users, the aim is not to make them compete with qualified multimedia professionals but to enable them in adding the value to their services with the help of multimedia.

Types of Multimedia Applications:

1. Topics mentioned below do not demand major content creation effort as most of the content is available in the form of Video Tapes, Photographs, Audio Recording, Information on Events etc.
2. It is presumed that above users will be able to digitize the contents on their own, as Video Capturing and Scanning are as easy as photocopying. Anybody is able to manage this work with minimum operational knowledge of hardware and software devices.
3. Utilizing multimedia technology can effectively render the identified subjects.
4. These creations will be valued as an archival preserved on CDs and as a cheaper option for producing multiple copies.
5. Presentation of these topics will enable the users in revisiting the memorable
6. Value addition to the information content and its innovative presentation will attract the users.
7. Users will prefer multimedia albums without any hesitation for it's attractive price.

Experiments with authoring tool based templates-

Initially, some sample applications like family albums, corporate event documentation were experimented by using Macromedia Director software. These applications were conceived and programmed by multimedia team at our center. A standard set of layouts, locations for audio, video and images were provided along with links for navigation. The targeted users were expected to replace the contents from the sample application by their own creations without spending any time on multimedia authoring. The targeted users started learning and practicing together the features of software, which were used in the pre-authored application. If the users would have succeeded in learning the use of templates then we had planned to create more such templates on different topics using authoring tools like Authorware, Icon Author etc. This approach would have given a wider choice to common people in terms of selecting the template and also the authoring tool depending on its availability.

The targeted class of users, however, faced several difficulties due to their non-computer background. They faced difficulty in-

1. Understanding the terminology used in the software.
2. Adopting the lingo scripting by copy and paste method.
3. Tuning or changing the script for specific requirement of application.
4. Independent experimenting with lingo scripts without the guidance of experts.
5. Struggling to solve the errors or other problems relating to functionality of application.
6. Managing various layers of sprites in the scoreboard.
7. Exploring by intuition.

They were able to use transitions, image movement along the path, integration of images and other components. Basically, these observations indicate that software like Macromedia Director is designed only for multimedia experts.

Cost versus Utilization:

As most of the multimedia authoring tools available in market are designed specially for multimedia professionals, the non-technical professionals find them very difficult to use. They are not using multimedia, as neither they afford the multimedia authoring software nor understand scripting lingo. The exercise of teaching these tools to them only highlights their limitations. They think that they are entering into a wrong profession. Even if these users determine to try the professional authoring tools, it will be very tough for them to keep pace with the changing authoring concepts, terminology and versions. There may be a few exceptions to above observations but we have changed our approach considering the feedback from majority of them. Looking at this scenario, the need for a simplified approach to multimedia authoring and content creation is strongly felt.

Existing Authoring Tools:

The developers of the popular multimedia authoring tools have tried to simplify and minimize the scripting but they are still not free from syntax errors. Graphically, the learning curve for these tools is very steep. The variety of features is a big overhead expense to the above mentioned users as they can use very few of them. These tools can deliver a wide range of applications with tremendous flexibility. Variable factors and options make the development process quite complex. The application development is explorative in nature and needs valuable contributions from the team of experts such as content creators and programmers. To make multimedia applications cost effective, it's development process must be mechanized so as to achieve faster delivery. One or two persons should be able to manage it's completion. I think, if someone is using only 25% features of a multimedia-authoring tool then why should he pay for the remaining unused 75% features? The proposed potential non-technical professionals will not emerge as users of multimedia due to lack of suitable authoring tools.

The existing multimedia authoring tools are priced in the range of Rs. 50,000 to 1,00,000 in Indian Rupee currency (Approximately 1200 USD to 2000 USD). We have proposed to price the pre-authored template at a cheaper rate as Rs. 10,000/- (220 USD) which is very cheap.

Authoring Tools and it's Effective Usage by Users			
Some of the Popular Authoring Tools			
* Authorware * Macromedia Director * Multimedia Toolbook * Icon Author Costing in the range of Rs. 50,000/- to 1 Lakh (1200 1500 USD)			
Power of Authoring	Applications	Users	Usage
* Flexibility of Integ./Inter. Models * Programing Capabilities * Extension to Web Authoring * Ever evolving features/ terms/ concepts * Scope for exploring in many ways * Totally customizable output	* Corporate Presentations * Product Presentations * Entertainment / Educational CD ROMs * Book Illustrations * Computer Based Training * Games * Culture and Heritage CD ROMs	Multimedia Professionals/Experts	100% usage of available features
* Only a few features required to serve the regular needs of presentation * Limited customization needs	Multimedia Albums, Documentation of Events, Product Catalogs, Archival etc.	Videographers, Photographers, SecreAuthoringarial Staff, Facilitators, Photo Lab Technicians, Event Managers, Qurators etc.	25% usage of features

Figure 1.2 Authoring Features and their Effective Use

Tool based Templates:

These templates are provided with software for helping and encouraging the beginners. The libraries of templates definitely help in educating the users, increasing the popularity and market as well. Such templates are very successful in the field of Desk-Top-Publishing, Web Publishing and Slide Presentations. Selected features of software are introduced in the templates depending upon the nature of application. (Example: Microsoft Power Point)

Authoring Template as a Tool:

Template as an independent authoring tool may offer very limited features but most users are likely to know and use them all. This tool is more like a device, which produces results by just clicking the buttons and options. In this, the user may not necessarily understand the process of authoring. Our task is to position the template similar to the cooking devices, which are used by housewives without much of training. They do not need to understand the mechanism in the food processor but are expected to know it's functioning and then concentrate on the recipe. The targeted multimedia users are not expected to spend energy in understanding the lingo scripting and the authoring concepts but are supposed to be interested in their applications. Tool based templates and template as a tool have their own set of applications and advantages. They need not be compared nor they are held against each other.

Dictionary meaning of Template: It means-

1. A pattern, mould, or the like, usually consisting of a thin plate of wood or metal, serving as a gauge or guide in mechanical work
2. Biochem. A molecule that acts as a pattern on which the molecular structure of another molecule is based.

The moulds and casts produce the same output every time. The authoring template can host and present new multimedia contents on varied subjects.

From the view point of multimedia authoring the meaning of template can be construed as under-

- * A standard navigational structure provided with Graphical User Interface for content integration
- * Predefined layouts for content presentation

- * Scalable while maintaining the pattern of template
- * Supported with component libraries for enriching the quality and personalizing the presentation
- * Application centric features

QuickMM Album Author:

Initially, a customizing template was explored with Authorware and presented in SAARC conference EMMIT '98. Later, however, we realized that it was difficult to create an independent Authoring Template using an Authoring Tool like Authorware and switched our development to Visual Basic 6.0.



Figure 1.3 Basic Structure of QuickMM Authoring Template

Start Page of Album Presentation:

The start page feature allows the user to set a background screen, title and animation or video clip to be played in the beginning of the presentation. The start page also has controls for manual browsing and automatic playing of entire album. Keyword search control helps the user in instant accessing of desired contents.

Photo Album, Video Album:

Album Author offers 3 types of albums such as Photo, Video and Visual Archival. Photo and Video albums are vertically extendable in terms of the number of categories and horizontally scalable in terms of the number of photos and video clips. The user can define the number of categories and contents. Each category is called as an Event as the template is designed mainly for event documentation. Layout of Event Title, Location of Photo and Caption can be set. It is possible to set a different theme of background and a cursor from the library. User can design icons for event links and connect an audio clip as background music to be played for the entire event. Transitions, designed with Indian Decorative patterns, can be applied.

There are several settings for the individual photos and video clips that are accessed through event links. It is possible to set a caption in any Indian script for every photo or video clip. One can connect a separate audio file for every photo. HTML files can also be attached to every photo or video clip. It is possible to create hot spots on the photos. Hot spots help you in indicating the names of persons or objects seen in the photo on mouse over. One can link multiple albums to an album.

Visual Archival:

Visual Archival can integrate images with varied resolutions. It is possible to assign keywords to images included in the archival so as to enable us in searching.

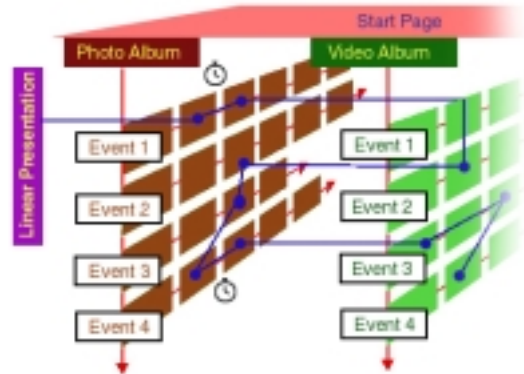


Figure 1.4 Linear Presentation

Linear Presentation:

It is possible to define a sequence of selected photographs and video clips for making a linear presentation. One can define the duration of pause for every photograph for synchronizing the presentation with audio.

Dynamic Index:

It is basically a tree structure having parent and children nodes which can be represented by thumbnail size icons. As you click on the parent node, it unfolds its children nodes. This feature does not reveal the full index at a glance but unfolds it in a step by step manner and thereby enable the user to understand the logical structure of information. One is also able to wind up the tree structure in reverse order. Each node of Dynamic Index can have unique properties. The user has access to these properties. You can have informative text as part of the properties and attach a HTML file or link an image and a video clip from album. This helps in speedily accessing the contents of a album. The need for family-tree-structure was perceived while working on a family album. We wanted to create an index starting with the ancestors to the current generation along with all the branches i.e. relatives and friends. This index is found useful in content structuring for all types of applications.

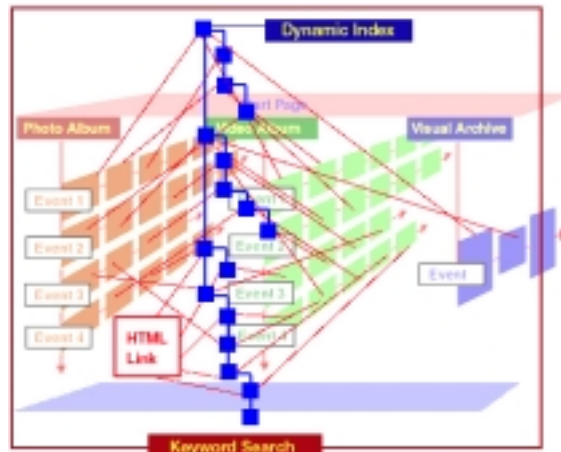


Figure 1.5 Search of Contents

Keyword Search:

This feature helps the users in searching with the help of keywords. The search is carried out over the captions and titles associated with the Photo and Video Albums. The search window shows a drop- down-list of photos along with thumbnail size previews related to the keyword. Preview is

not shown for the video clips. One can assign keyword for the contents, which are part of the visual archival.

Library of Backgrounds and Cursors:

A library of theme based Backgrounds and Cursors is provided with the software. The backgrounds are based on the themes pertaining to corporate, children, traditional, floral, abstract etc. Users can enrich these libraries by contributing new designs. It is possible to select a different design of cursor for every new category in the album.

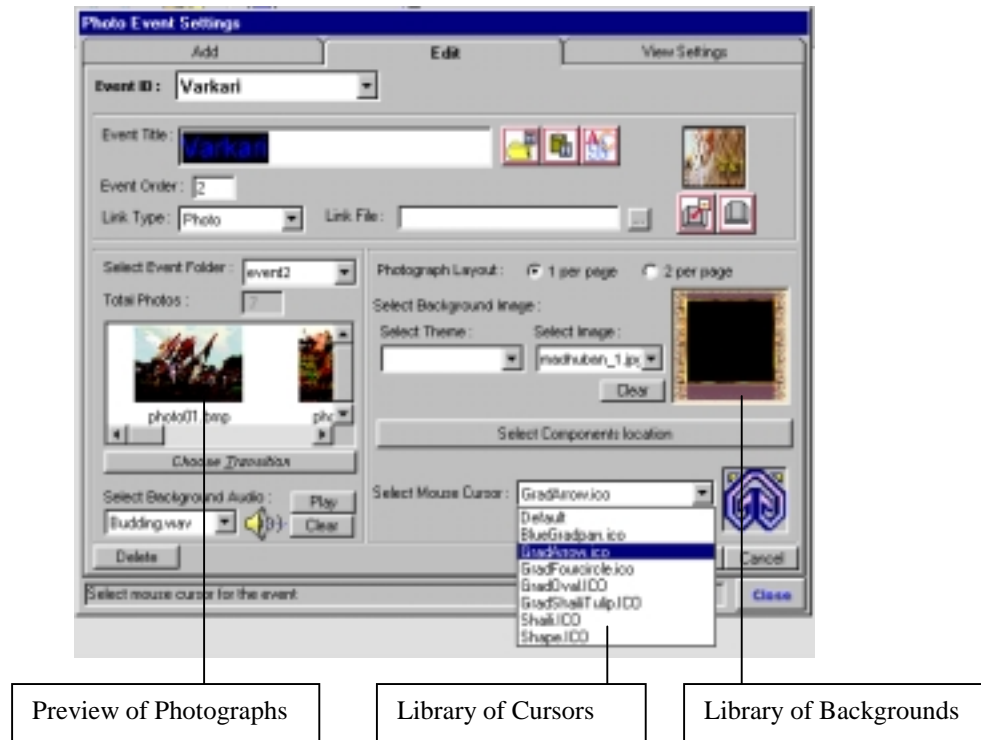


Figure 1.7 Photo Album Edit Controls

‘Shaili’ a collection of decorative designs:

A large collection of decorative designs has been created and packaged as a CD Title called ‘Shaili’. It contains various categories of designs such as Motifs, Tiles, Borders, Corners, Arches and Decorative Components using which new kaleidoscopic variations can be evolved. This huge collection of decorative designs is created with the inspiration from the designs, which have appeared on our ancient Indian temples, architectures, embroideries and miniature paintings.

These readymade designs are helpful to the multimedia users in giving traditional identity and appearance to their applications. The designs are made available in several application file formats such as *.cdr, *.ai, *.wmf, *.shp, *.3ds, *.jpg, *.bmp, *.gif along with varied resolutions. Three-dimensional decorative models have also been provided.

Application Testing & Case Studies:

Explorations by Students:

Album Author software is introduced through the multimedia training programs which are designed and conducted by National Multimedia Resource Center. Around 100 students have used this template for creating multimedia albums. We have incorporated the suggestions of students in improving the template. The students were able to learn, design and deliver the multimedia albums within one week.

Explorations by Prospective Users:

We had invited some Video/Photographers and offered them to use our infrastructure and software for delivering their first assignment of Multimedia Album. They developed a few family albums and some of them have now invested into a multimedia facility. Secretarial and Facilitation staff is able to quickly understand and use Album Author for the multimedia documentation of Corporate Events.

Explorations by Development Team:

It was essential to test album author by developing case studies and trying it with live applications. Therefore, several types of events were chosen such as Pilgrimage (Cultural Event) Marriage (Family Event), Conference (Corporate Event), Product Catalog (Marketing Application), Portfolio (Archival). We were able to discover the strengths and weaknesses of our software through these case studies. In the process, we were also able to test the scalability, flexibility of usage and reliability of the template.

Proceedings of conferences namely SAARC Conference EMMIT' 99 and Multimedia Technology for Culture 2000 are integrated and presented by using Album Author Software. We have woven the photographs and video clips of speakers along with their Power Point Slides and Research Papers in HTML format. Dynamic Index shows the conference program schedule and links the profiles of all the speakers. These applications have proved that the template can enable a semi skilled person in delivering such applications in the shortest possible time.

QuickMM Album Author 1.0 is complete and ready to be marketed as a product. It is proposed to extend the template further for developing museum archival system.

Conclusions:

Reduction in Production Time and Cost

1. It is possible to make application centric pre-authored templates.
2. Use of such pre-authored templates reduce the production time and cost.
3. The pre-authored multimedia template can allow some amount of flexibility for creative presentation of contents without changing the structure of template.

Easy to Learn and Use

4. Authoring Templates reduce the operational difficulties of the user and let him concentrate more on the final deliverable.
5. Template based authoring encourages and enables the non-technical professionals in creating multimedia applications without requiring to develop any scripting, lingo or programming skills.

Propagation among Masses

6. Multimedia Authoring Template like Album Author enables the user in offering service oriented multimedia applications due to its simplicity of usage. Knowledge of multimedia and authoring templates can provide a new vocation for people.
7. Application centric and pre-authored multimedia templates are useful for propagation of multimedia technology among masses.

References:

1. A. B. Saha, "Low Cost Multimedia Content Creation: An Indian Perspective", Proceedings of Virtual Systems and Multimedia '99 International Conference Proceedings, University of Abertay, Dundee, Scotland, UK. (Sept. 1999)
2. Dinesh S. Katre, "Multimedia Rendering of Spiritual Texts" Proceedings of Virtual Systems and Multimedia '99 International Conference Proceedings, pp. 500-507, University of Abertay, Dundee, Scotland, UK. (Sept. 1999)
3. U.S. Census Bureau, 2001 (<http://www.census.gov/cgi-bin/popclock>)
4. The Economic Times, June 26, 2001 issue, article entitled 'India's giant middle-class tantalizes goods-makers' (<http://www.economictimes.com/today/26econ11.htm>)