"Evaluation of Multimedia Authoring Platform Attributes"

Mr. Prakash Kumar U[1] Dr. Vijay Prakash Agrawal[2]

[1]Research Scholar, Singhania University, Jhunjhunu, Rajasthan

Abstract – Multimedia authoring plays a major role in developing multimedia applications. Recent trends, innovation in software compelled the multimedia developer to re-look into the development phenomenon. Technology innovations triggered multimedia to spread its horizons beyond the boundaries. Once limited for presentations only, today multimedia is a part of technology in each and every information transformation process. Multimedia authoring framework is in use, ever since the time various multimedia components are integrated and used as a part of the contents of the computer system whether it is designed for learning or for designed for games. Compare to multimedia application software, multimedia authoring systems have better capability to build the content, develop and integration of multimedia components and systems. This paper identifies and evaluates various attributes of multimedia authoring platform with comparison to other application development environment.

----------♦----------

I. INTRODUCTION

Multimedia authoring system helped multimedia developers to explore wide varieties of multimedia application development for various platforms [1]. Rapid changes in the multimedia hardware and software enabled multimedia authoring framework as the most preferred developing environment for the multimedia content developers.

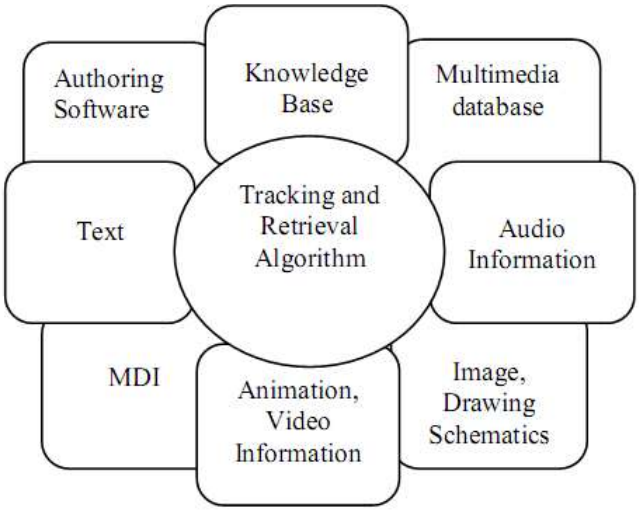

Fig. 1 Basic Multimedia Authoring System

Multimedia authoring system facilitates the developer to go beyond multimedia application software development capability for designing any integrated multimedia system by facilitating authoring features using programming concepts as shown in Fig. 1 Using multimedia authoring framework, multimedia developer can design an effective multimedia learning system with powerful interactivity features [2].

Multimedia authoring usually takes place in an interactive development environment. The authoring framework facilitates simple programming language, interactive tools and techniques for handling large volume of multimedia data without requiring specialized skills or knowledge [3]. Earlier high level languages (BASIC, C, C++, PASCAL) were used to develop multimedia applications. These high level languages were not simple due to complex coding structures and that is the greatest disadvantage which was overcome later by using authoring framework.

OVERVIEW OF MULTIMEDIA AUTHORING SYSTEM

Authoring framework consists of simple scripts or authoring languages along with tools for multimedia component creation. These are specifically derived as a command and used used especially to handle most of the multimedia components in user friendly platform for multimedia application development.

Development of multimedia applications whether it is for learning or for fun needs to structured integration and various multimedia components like image, audio, video, animation, three-dimensional graphics and text. These components contain huge data sets and large files. Further representation of these multimedia data needs additional information like spatial data representation matrix, color information, resolution information etc. Apart from having different file specifications these multimedia components have the compatibility issues, loading time delays as well as some time needs add-ons like device driver configurations? Hence programming for these multimedia components consists of additional complex coding.

Multimedia authoring facilitates the developer to create a multimedia system for teaching and learning using programming as per the requirement[4]. Here the designed system will not have the feature to customize as per user choice during the time of visual representation. User interface authoring is facilitated as an additional features in the multimedia authoring level[5]. Using User Interface Authoring mode, user can customize the Multimedia Content, Multimedia Content Management System, Multimedia Information Retrieval and Multimedia Authored contents as per requirement as shown in Fig 2.[6].

Fig. 2 Multimedia Authoring Framework

MULTIMEDIA AUTHORING DATA REPRESENTATION

Multimedia content can be classified based on their characteristics, representation and utilizations [7]. Multimedia uses multiple form of media. Further design and development of multimedia application can be done by using different methods, technologies and approaches. From the point of implementation, usage and utilization multimedia can also be classified as separate entity. Similarly based on dynamic or static nature of content leads to another way of classification.

Based on the types of media multimedia content can be mentioned as

- Text (vector, paragraphs, text arts, book, characters)
- Image (digital or scanned, schematics)
- 3D (graphics, models, drawings)
- Audio (digital, MIDI, speech, music)
- Video (movie clip, video clip)
- Animation (2D and 3D)

Text as a multimedia content plays a major role in multimedia application development. It is a formation of fixed size character from a character set called as ASCII table. Texts as a multimedia component are normally of two-dimensional in nature. Visual representation of this character is determined by the usage of vector formats named as font. The reason why vector specification mentioned here is because, whenever different types and sizes of character formation occur, there should not be loss of characteristics, attributes or physical appearance. That is only possible if the characteristics of fonts are of vector in nature. Further appearance and positioning of group of text or paragraph needs to be defined as formatted or unformatted. To fill theses text in the specified area, justification characteristics needs to be assigned. Hence handling text as a multimedia contents along with other media components needs re-orientation of various attributes and characteristics of text [8]. Text can be further classified as

- Unformatted Text
- Formatted Text
- Rich Text Format
- Raster Text
- Embedded Font Text
- Font map Text
- Media Text

An image in digital format is the most important part of the multimedia content. An image is nothing but formation of pixels in the grids. Each grid formation is in a rectangular shape. Formation of pixels in two dimensional arrays visualized as an image. Visual representation of these

images further influenced by various attributes like resolution, size, position and colors. Definition of this image can be further classified based on color depth. Color depth or bit depth. It specifies the number of colors used in a pixel. While using these images within the context of multimedia authoring framework, designers and developers needs to give special attention, because bit depth also influences the large volume of multimedia data within the applications. Different kind of image color mode like grayscale, bitmap, index colored, RGB colored and CMYK colored also contributes to the data sets of images. Other image attributes like brightness / contrast, exposures, hue / saturation, channels, threshold, color palettes and gradient maps values also contributes during digital image formation. Digital Image can be further classified as

- Raster Image
- Vector Images

Based on pixel values images can be further classified as

- Black and white
- Gray Scale
- Color

Three-dimensional graphics or models consists of complex as well as huge data structures and as a multimedia content can be classified separately due to distinguished attributes. Utilizing three-dimensional graphics as a multimedia content with in the multimedia application content design framework or multimedia authoring framework require advanced spatial and control parameters because of three-dimensional data representation matrix are involved[9]. Visual representation of these three-dimensional graphics or model further needs details about viewports, geometric data representation, and location, height and position information. Further visual three-dimensional effects on two-dimensional viewport contains color, shades, light and special effects parameters. Three-dimensional graphic creation also consists of multiple way approaches. Designer can use polygon modeling technique, mesh modeling or spline modeling techniques to achieve basic modeling creation. Various modifiers can be applied on to the basic models to acquire special effects onto the existing three-dimensional models and then can be rendered and converted into three-dimensional graphics. Establishing interactivity to three-dimensional graphics using multimedia authoring framework is a challenging tasks and only few researchers achieved the breakthrough in this directions.

Audio contents are normally embedded either internally or externally to the multimedia application during playback. Digital audio content stored externally and separately for the any designed authoring applications. On demand these audio files called and are synchronized with the events with respect to time or frames. Speech, Music or any other sound can be digitized and integrated with the multimedia applications.

Digital video as a part of multimedia component requires large data handling, and programming for controlling the playback. Separate player can be configured with in the application framework or programmed controls can be established. Large file size of digital video information makes the developer to opt for embedding the digital video externally to the applications or call on demand and play as per requirements. Digitization of video information also needs to be taken care about standards and formats.

EVALUATION OF MULTIMEDIA AUTHORING PARADIGM

Multimedia authoring paradigm evaluation based on authoring framework characteristic shows that multimedia integration features are superior when compared to other multimedia application development environment [10]. The capability comparisons are showcased in Fig. 3.

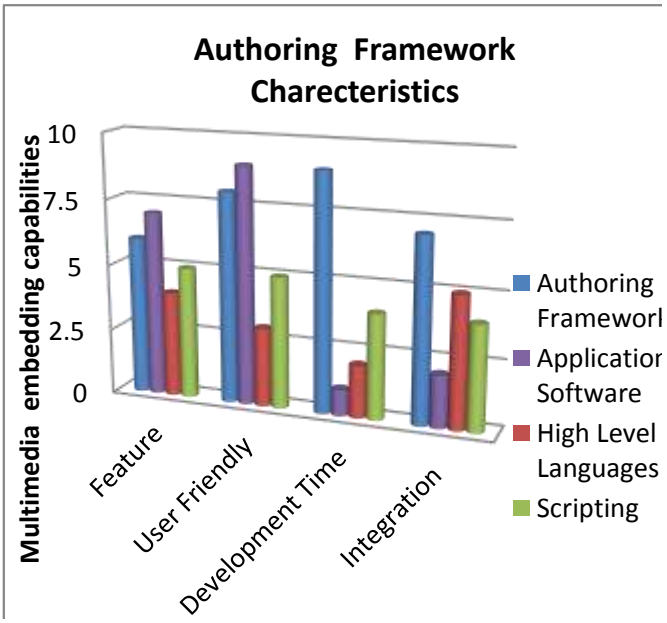

Fig. 3. Authoring Framework Characteristic Comparison

Further Multimedia Authoring framework supports excellent media integration compared to any other development platform as shown in Fig. 4.

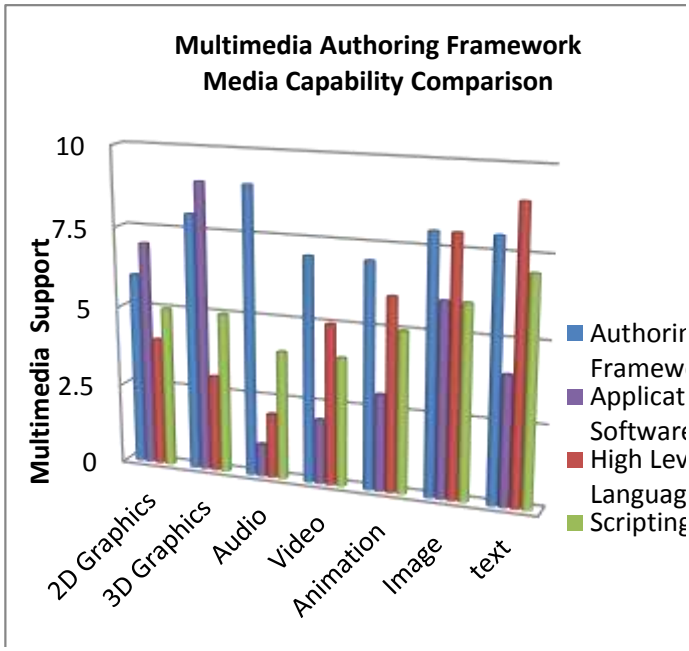

Fig. 4 Media Compatibility Comparison

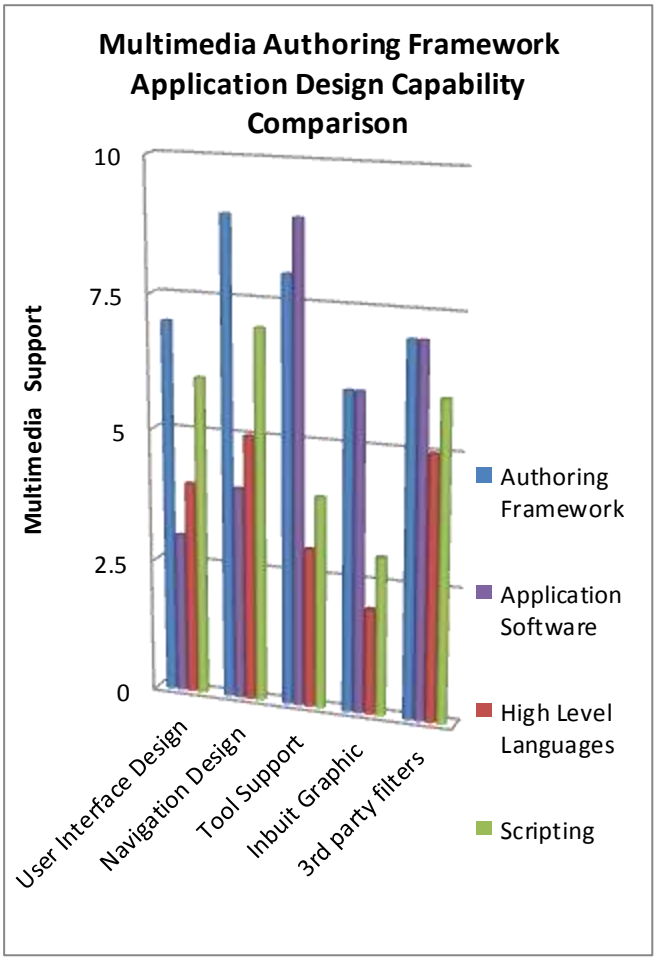

Fig. 5 Multimedia Application Design Capability Comparison

Observe in Fig 5. That application design features like capability of user interface design, navigation and control design, inbuilt graphic supports and tools availability was better in Multimedia Authoring Framework.

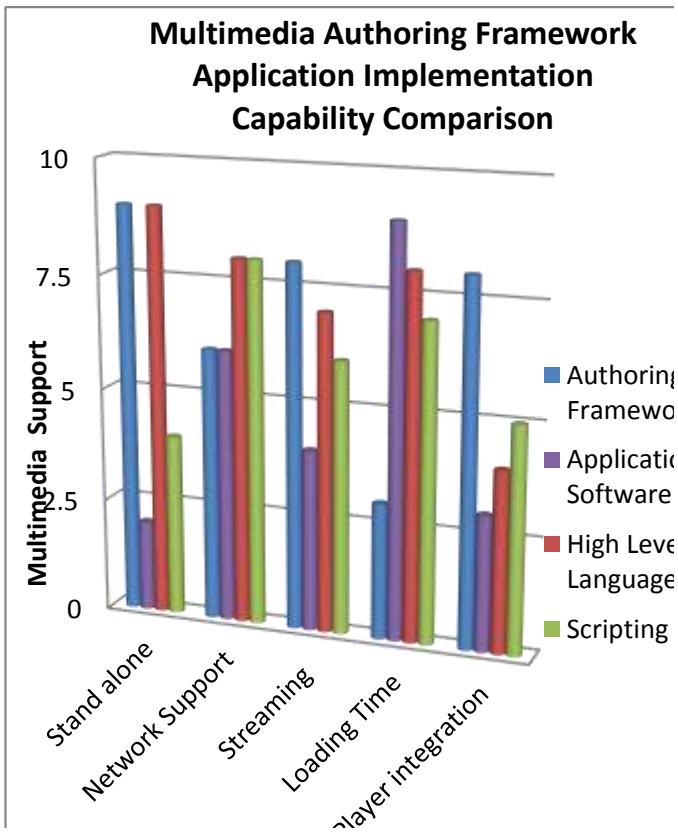

Fig. 6. Multimedia Application Implementation Comparison capability

As shown in Fig 6., multimedia authoring framework also supports application implementation in stand-alone and network mode. This enables the developer to use multimedia authoring platform as an alternate option whenever fast application development and integrations are needed.

CONCLUSION

This paper presents a detailed attribute evaluation of multimedia authoring framework in comparison to application software, high level languages and scripting.

The evaluation result clearly shows that despite having greater options for application development, multimedia authoring framework still better choice for fast application development with limited features.

REFERENCES

[1] M. Shaker, N. Shaker, J. Togelius," Ropossum: An Authoring Tool for Designing, Optimizing and Solving Cut the Rope Levels", published in Association for the Advancement of Artificial Intelligence, 2013

[2] T. Said, and M. Djoudi, " Developing Adaptive E-learning: An Authoring Tool Design", International Journal of Computer Science (JCSI), Vol. 8, Issue 5, No 3, September 2011.

[3] T. Vaughan," Multimedia Making it Work", Tata McGraw Prentice Hall, 6th edition,2006

[4] C.A. Dick, H. Lynda, J. W. Tukey "Structured Multimedia Authoring", ACM Transactions on Multimedia Computing, vol. 1, pp. 89-109,2005

[5] M. E. Cook, "Principles of Interactive Multimedia". McGraw, 1st edition.

[6] S. Debbie, J. Caroline, J. Mark, W. Shiley," User Interface Design and Evaluation", Morgan Kaufmann Publisher, 1 st edition.

[7] I. F. Cruz and W. T. Lucas, "A Visual Approach to Multimedia Querying and Presentation", ACM Multimedia, Seattle, USA, 8-14 Nov, 1997.

[8] S. Jeong, S. Nam, H. Young Park," Ontology based Biomedical Research Paper Authoring Support Tool", Journal Article Tag Suite Conference (JATS-Con), 2013

[9] E. Meyen, R. Aust," The development and validation of a modular e-book authoring system", Ninth lasted international conference and advanced technology in education October 4-6,2006

[10] P. K. Agrawal, Dr. G.R. Bramnote, "Reviews on Authoring tools",International Journal of Advanced Research in Computer Science and Software Engineering, 2014.

Prakash Kumar U was born in Udupi, India. He pursued Master of Technology (M. Tech.) In Information Technology from Sam Higginbottom Institute of Agriculture, Technology and Sciences (Formerly Allahabad Agricultural Institute).

At present he is pursuing his Ph.D. from Singhania

University, Rajasthan, India. His area of research is Multimedia, Vision Computing, Computer Graphics, Multimedia Data mining, Knowledge Discovery, Digital Media design and Image Processing. He has vast experience in industry, academics and research. He involved in teaching, training, academic publications in various Universities, Premier Government Institutes, Defence Training Establishments and Public Sector Undertaking Training Institutes in India. He is currently an Associate Member of Institution of Engineers (INDIA) and also a Member of Quality Circle Forum of India.

Dr. Vijay Prakash Agrawal pursued his Masters during the year 1967 and Ph.D. from Agra University in the year 1998. He was a former Associate Professor in post-graduation department from Babu Shivnath Agrawal College; Mathura affiliated to Dr B R Ambedkar University, Agra.

During the span of 43 years of his teaching profession, Dr Vijay Prakash Agrawal contributed his services to various academic and educational endeavors.