

Technical Briefs #3

by

Chaelynn M. Wolak
wolakcha@scsi.nova.edu

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School of Computer and Information Sciences
Nova Southeastern University

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Multimedia Production

The Stator Hub Torque Converter Red Oak System is a stand-alone multimedia production used to train employees on the Stator Hub process. Essentially, the Stator Hub process consists of machining a steel hub, inserting small metal fins, and welding a top hub to it. An enclosed computer sits next to the equipment where an employee can review the process and learn how to set-up the process equipment. The following sections of this paper briefly describe the design implications of the Stator Hub Torque Converter Red Oak multimedia production in a stand-alone application versus a networked application.

Stand-alone Application

The Stator Hub Torque Converter Red Oak System is designed for stand-alone use for a very good reason. Due to the large amount of graphics, video, and animation content, it would make it almost impossible to stream across a network without major equipment and backbone changes which come at a very high cost.

One of the benefits of having this as a stand-alone application is there are literally no constraints on the amount of graphics, video, and animation content. The only constraint is the hardware where the multimedia production resides. Other than that, the design of the multimedia production can have long video clips, multiple animation scenes, and many graphics. This is because one does not have to worry about bandwidth constraints that result in latency and jitter in a networked application since all information resides right on the hard drive where it is located. In essence, synchronization of the multimedia content is perfect.

Nevertheless, being only a stand-alone application has one main disadvantage. It is just that – stand-alone. It can only be placed on one computer, which has to be

strategically located. In the case of the Stator Hub Torque Converter Red Oak system, many questions arose about the location of this multimedia production. For instance, is it best placed next to the process equipment or in an office? If placed next to the equipment, would an employee be able to even concentrate or much less hear it due to the large amount of other factory noise? If placed in an office, would an employee not learn and retain process information if he/she could not see the process equipment first hand to compare it to the multimedia training application? These types of questions are not easy to answer since it depends on each individual employee's learning capabilities.

Networked Application

Even though a stand-alone application seems to be the best approach, there are benefits for having this Stator Hub Torque Converter multimedia production networked. One of the primary goals of networking is resource sharing (Tannenbaum, 1998). Therefore, users at various locations can have access to the training program such as in the break-room or in an office. However, significant design changes would be needed for this Stator Hub Torque Converter production to be networked.

The video content would have to be shortened due to bandwidth constraints. The same holds true for animation content. "Maximizing bandwidth efficiency in distributed continuous media streaming systems is the key in delivering cost-effective multimedia services to distributed and heterogeneous receivers" (Zhao & Tripathi, 1999, April 29 - May 6). If it is not shortened, then there is a high probability of latency and jitter (i.e. synchronization problems).

There are two design solutions to this problem. One is to incorporate a special compression scheme such as time compression. The second is to keep the video short

focusing only on key elements that require it to be in video format. However, the negatives to both solutions are the following. In a special compression scheme, it could be computationally more expensive for the client, as the CPU has to decode more information in a short amount of time (Omoigui, He, Gupta, Grudin, & Sanocki, 1999, May 15 - 20). Lastly, when video is kept short, it has to serve as a supplement to text and images more often than being the main content of the multimedia production (Nielsen, 1995, December). In the Stator Hub Torque Converter application, video needs to be the main content due to the complexity of the process. It follows the saying that “a picture is worth a 1,000 words.”

Lastly, one must be careful about copyright rules. Copyright rules affect a multimedia production no matter if it is stand-alone or networked. However, if copyright permission was given for the stand-alone application, one must not assume it is given for distribution in a networked application (Kordsmeier, Gatlin-Watts, & Arn, 2000). In a networked application where multimedia content is distributed among many users, copyright rules do change. One must verify permission is granted for either approach.

Conclusion

It can be hard to determine the best approach for a multimedia application. In the Stator Hub Torque Converter Red Oak system, overall it is better for a stand-alone application due to the complexity of the process. The training program needed to be comprehensive. However, to alleviate the main disadvantage to the stand-alone application, a slightly different version of the training program should be produced and networked. Due to the amount of employee turnover, it would probably be beneficial to have an overview-training program networked with a more detailed stand-alone version

next to the equipment. This way, the best of both worlds (stand-alone versus networked) are used to compliment one another.

References:

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Interactive Kiosks

By 2003, the number of interactive kiosks is expected to grow to \$2.94 billion (McCann, 1999, June 14). The reason for this large dollar amount is interactive kiosks have the ability to offer information and products anytime, anywhere while simultaneously reducing labor costs (Lawson, 1999, April 20). It is expected that kiosks will soon be commonplace in public places. This paper briefly describes an interactive kiosk application used by the Stars Theatre called OrderPoint.

Program Description

The Stars' Theatre OrderPoint interactive kiosk system is located in the Great Lakes Crossing Mall in Auburn Hills, Michigan. There are four kiosks placed in front of the theatre entrance inside the mall. The manufacturer of the kiosk system was Radiant Systems.

The kiosk is approximately six feet tall with a 15-inch touch-screen color monitor. It has sound, a credit card reader, and a ticket printer. It does not have a keyboard. The display screen of the kiosk is to insert a credit card. Upon inserting a credit card, a main menu appears to order movie tickets. After each action, a male voice describes the next instruction. This instruction is complimented with text on the screen.

Next, the user must select the movie he/she would like to see. The selection is colored block rectangles. Upon selection of the movie title, another menu appears in rectangle format of times the movie is playing. After selecting a time, a final menu appears to select the type of ticket (i.e. adult, child, or senior). Lastly, the order is placed and the tickets are printed.

Accomplishment of Objectives

The use of multimedia in this application was very limited. Basic graphics and sound were the main multimedia components. However, the kiosk does provide a specific function. It allows customers to immediately purchase movie tickets without having to stand in line.

Even though the kiosk was great at purchasing movie tickets, there are improvements so it can be more effective and functional for the customer as well as Stars Theatre. First, information about the movies would have been helpful. A quick summary of the movie could help a customer who is not sure of the type of movie he/she would like to see. Along with that, the kiosk should have shown the rating (i.e. G, NR, R) of each movie.

After selection of the movie, it would be helpful if the kiosk could display how many seats are left for that movie time. This information lets the customer know how busy the theatre will be. This way he/she can gauge how far in advance to go reserve his/her seat.

In addition, Stars Theatre can utilize the kiosk more to their benefit. From the main menu, they should have information about the theatre, information on all the munchies they have to offer, coupons/discounts, and party rate information. Currently, it is not being used as an advertising medium for them. This is one way to inexpensively add advertising. Lastly, the Stars' Theatre OrderPoint kiosk should offer some type of feedback information such as time and date or how long until the next movie showing.

Conclusion

Interactive kiosks are part of the newest persuasive technologies called captology (Fogg, 1999, May). It can function in three basic ways – as a tool, as media, or as a social actor. In the case of the Stars' Theatre OrderPoint kiosk, it strictly functions as a tool.

The Stars' Theatre OrderPoint kiosk makes an essential contribution by allowing individuals to purchase movie tickets without standing in long lines. The main purpose is to give individuals the sense of having immediate customer service when purchasing movie tickets. In this case, the interactive kiosks are a perfect application.

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Evaluation of Three VR Productions

Virtual reality systems allow users to perceive products in very realistic terms (Kremer, 1998, October 18 -23). The objective of a VR production is it is written so well that the user ignores outside stimuli and only focuses on what he/she sees and hears from the computer (Tannenbaum, 1998). This brief paper evaluates three virtual reality productions using the 12 bipolar scale from the Tannenbaum textbook.

IPIX

The rating below describes the author's experience using IPIX, <http://www.ipix.com>, technology viewing the Chelsea Flower Show via the Internet.

	Rating Scale					
	(least)				(most)	
	1	2	3	4	5	
Non-interactive				X		Highly Interactive
Slow Image Update					X	Fast Image Update
Simple Image				X		Highly Complex Image
Non-engaging Content				X		Highly Engaging Content
No sound	X					Three Dimensional Sound
Basic Screen Display		X				Head Mounted Display
Low Resolution Image				X		High Resolution Image
Monoscopic Image	X					Stereoscopic Image
Small Field of View	X					Full Field of View
No Head Tracking	X					Full Head Tracking
No Body Motion Sensing	X					Full Body Motion Sensing
No Tactile Feedback	X					Full Tactile Feedback

The author really likes the IPIX “bubble” technology. The picture is superb since it was of the real environment (i.e. flower show setting). A real scene remains crucial to the success of most virtual reality applications (Tatham, 1999). However, due to the small view window, the author did not “feel” that immersed. She wished it could have been full screen with good display quality and sound.

Xippix

Xippix, <http://www.xippix.com>, is one of the competitors to IPIX. The author viewed all product examples. Below is the rating scale based on the author’s experience viewed via the Internet.

	Rating Scale					
	(least)				(most)	
	1	2	3	4	5	
Non-interactive		X				Highly Interactive
Slow Image Update		X				Fast Image Update
Simple Image			X			Highly Complex Image
Non-engaging Content		X				Highly Engaging Content
No sound	X					Three Dimensional Sound
Basic Screen Display	X					Head Mounted Display
Low Resolution Image			X			High Resolution Image
Monoscopic Image		X				Stereoscopic Image
Small Field of View	X					Full Field of View
No Head Tracking	X					Full Head Tracking
No Body Motion Sensing	X					Full Body Motion Sensing
No Tactile Feedback	X					Full Tactile Feedback

According to the magazine advertisement, Xippix is a complete robust imaging solution using its ImagePump technology. Here again the pictures were of the real environment. However, to navigate it was “choppy”. By panning, the author did not get the sense of being “immersed”. Registration problems can occur due to latency between updates (Tatham, 1999). The author would prefer a smoother transition when panning and a larger viewing window. In addition, sounds would make this virtual reality solution more “real”.

Worlds Inc.

The rating below describes the author’s experience using Worlds’,

<http://www.worlds.com>, 3D viewing portal.

	Rating Scale					
	(least)				(most)	
	1	2	3	4	5	
Non-interactive					X	Highly Interactive
Slow Image Update					X	Fast Image Update
Simple Image			X			Highly Complex Image
Non-engaging Content				X		Highly Engaging Content
No sound					X	Three Dimensional Sound
Basic Screen Display			X			Head Mounted Display
Low Resolution Image			X			High Resolution Image
Monoscopic Image				X		Stereoscopic Image
Small Field of View					X	Full Field of View
No Head Tracking			X			Full Head Tracking
No Body Motion Sensing	X					Full Body Motion Sensing
No Tactile Feedback	X					Full Tactile Feedback

The author had to download the WorldsPlayer. The author found this to be the best virtual reality production of the three she evaluated. Computer graphics are used to simulate an environment. She was a penguin where the numeric arrows were her navigation. If she turned to the left, the penguin's head would turn to the left. There was even music. The author could make the environment full screen, however, the display quality of the environment was not that great. One of the things that would make this better is more depth perception in the graphical background. It still appeared very "cartoon-like". "It is of fundamental importance in conveying a convincing depth perception that, where appropriate, real objects appear in front of the virtual, occluding parts that cannot be seen, and virtual objects that are suitably interposed before the real background" (Tatham, 1999).

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