Multimedia Technical Briefs - Set Three

by

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Chapter 1

Technical Briefs Set Three - Topic One:

Multimedia Production Considerations

DISS 780 Multimedia Presentation 2 - IPIX Virtual Reality "Bubbles" was comprised of a variety of multimedia file types (Wolak, 2000, May 26). Audio and video files included in the presentation were AVI, IPIX, JPEG, MIDI, and WAV. When combined with the textual content of the presentation, these files required 33 megabytes of data storage. Designed to run as a stand-alone multimedia production, the PowerPoint presentation required considerable hardware, software, and storage capabilities at the client. This was demonstrated by the need to reserve between 15 and 30 seconds to load the presentation before advancing to the introductory slide. In light of the resource requirements placed upon the stand-alone client to successfully run the presentation, it is reasonable to assume that design modifications would need to be made to effectively deploy a networked version.

In the following sections, this brief discusses the design considerations that would need to be incorporated in a networked version of *IPIX Virtual Reality "Bubbles"*. These considerations include network bandwidth and QoS requirements and the copyright and licensing implications of transmitting multiple simultaneous copies of the sound and image files that make up the presentation.

Bandwidth and QoS Considerations

To successfully distribute a networked version, new issues need to be addressed. Two of these are the need for large aggregate I/O bandwidth and the guarantee of real-

time performance to ensure reliable and synchronized playback at the client (Vernick, Venkatramani, & Chiueh, 1996). Currently the bandwidth and QoS requirements to deploy the presentation "as is" are not available over the Internet. These limitations can be addressed by either stripping the presentation of most of its multimedia content or by delivering the presentation in a manner that compensates for the limitations of the Internet. The latter is the most acceptable.

The stand-alone version of the presentation is delivered using the standard PowerPoint viewer. PowerPoint was not designed for networked multimedia distribution. An authoring and presentation application such as INTELLECT would be more appropriate for the networked version (Liew, Lau, Lau, & Fung, 1999, June 15). Unlike PowerPoint, INTELLECT provides synchronized multimedia presentation, scalable reliability, and automatic adaptation.

INTELLECT's synchronized multimedia presentation functionality supplements HTML with synchronization information that coordinates the simultaneous presentation of text, audio, video, and images over the Internet. In addition, INTELLECT uses a scalable retransmission scheme that makes the best tradeoff between "real-timeliness" (small delay) and reliability. Another benefit of INTELLECT is its streaming protocol that automatically senses system throughput and adapts to achieve the best quality. This automatic adaptation dynamically adjusts the quality of the presentation in accordance to the supportable data rate of the network.

Although programs such as INTELLECT are able to compensate for network shortcomings, consideration should be given to minimize the use of large media files (where appropriate) to reduce the effect poor network transfer rates.

Licensing and Copyright Implications

The licensing and copyright implications of transmitting multiple simultaneous copies of the presentation over the Internet must also be considered. For example, many of the image files (JPEG) used in the presentation were purchased online from Corbis.com (Corbis, 2000). The Corbis licensing agreement allows for the "personal use" of the images (i.e. private, non-commercial). Widespread transmission of copies of these images over the Internet is forbidden. Corbis does offer two other licensing options: traditional and royalty-free. Royalty-free licensing allows the user to use an image an unlimited number of times for a one-time flat fee. This licensing option is the only one appropriate for the distribution of the Corbis images in Presentation 2 over the Internet. As a result, additional fees would need to be paid to upgrade the existing personal use licenses.

In addition to the image files incorporated in the presentation, many of the sound files (WAV) were purchased from the SFX Gallery (SFX-Gallery, 2000). Similar licensing upgrades would also need to be purchased before widespread distribution of the files.

Summary

Presentation 2 was developed to be played back on a stand-alone client, and PowerPoint proved to be an effective application. However, if both stand-alone and networked versions of the presentation are a requirement, PowerPoint is a poor choice and an application such as INTELLECT would be more appropriate. In addition, broader licensing would be required to legally distribute many of the multimedia files over the Internet.

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Chapter 2

Technical Briefs Set Three - Topic Two: Multimedia Kiosk

The Great Lakes Crossing Mall recently opened in Auburn Hills, Michigan. Positioned strategically throughout the 39-acre complex are a number of multimedia information kiosks (Great Lakes Crossing, 2000). Each kiosk is a special purpose interactive multimedia computer system designed to enhance the shopping experience of the mall visitor. In the following pages, this brief begins with a description of the features of a typical kiosk. Next is a discussion of the objectives of the kiosk and whether or not those objectives are met. Finally, the paper evaluates if the kiosk just attracts attention or if it makes an essential contribution to the shopping experience at Great Lakes Crossing Mall.

Features

The kiosk, visited by the author, was a product called CENTERLINQ produced by Genesis Intermedia (Centerlinq, 2000). The kiosk consisted of an attractive circular enclosure that housed a multimedia computer system. System components included a full (rubberized) keyboard with touchpoint mouse, a 21-inch touch screen monitor, stereo speakers, laser bar code scanner, and a printer. The operating platform for the computer was Microsoft Windows NT along with a custom kiosk application.

Along the sides and top of the system's home page were navigation buttons that accessed a variety of topics: sports, free forum, news, travel, banner ad, American Express ad, fashion, homes, weather, and Internet. Along the bottom of the display were buttons that accessed information specific to the Great Lakes Crossing Mall (i.e. mall

info, events, food and drink, coupons, main, rewards, sales, movies, and community info).

The majority of the content accessed by the kiosk was Internet-based. For example, the "news" button linked to the USA Today Web site, the "homes" button went directly to the Century 21 home page, and the "fashion" button pulled up the CNN fashion site. Buttons specific to the mall accessed content that was locally stored on the system's hard disk.

The system hardware was fully functional (although the touch screen monitor was slightly out of calibration). The printer proved handy for printing store directions and the discount coupons available only at the kiosk. In addition, the laser scanner was available to scan "reward cards" and thus enable frequent mall visitors to accumulate product discounts and other special incentives. Examples of coupons offered were $25 off prescription glasses at DOC and a free desert at the Alcatraz Brewing Company restaurant. Another interesting feature of the kiosk was its ability to access real-time traffic and road conditions in both the immediate vicinity and the greater metropolitan area.

The kiosk's user interface was intuitive and capable of supporting users of varying computer familiarity. However, the interface fell short in the area of user feedback. Feedback in response to a user's actions is key to any usable interface (Jordan, 1998). Specifically, the kiosk failed to notify users when large multimedia files were being accessed. As a result, the author had a tendency to push buttons multiple times and achieve undesirable results.

Objectives

The objective of the kiosk, which is operated by the mall developer, is to provide mall visitors with information to make their shopping and dining experiences more productive and enjoyable. The indirect result of which should be repeat business and increased profit for both the mall developer and the mall's tenants. Does the kiosk accomplish these objectives? Yes, shoppers observed by the author appeared to be pleasantly surprised and informed by the experience.

However, a recent article by Bachman commented on the mixed feeling of mall tenants toward the latest generation of Internet-enabled multimedia kiosks (Bachman, 1999). Many are worried about potential losses as more consumers shift their business to the Internet (a practice that is encouraged by the Internet banner ads common on this type of kiosk).

Essential Contribution or Attention Grabber

The kiosk was definitely an attention grabber. Curious mall visitors consistently stopped to see what the kiosk offered and why others were so interested in it. Does it make and essential contribution? If you are a coupon clipping, cost conscious shopper or someone who always seems to get lost, the answer is yes. However, after their initial curiosity wore off, most mall visitors paid little attention and continued to shop and people watch.

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(Note: This optional topic is substituted for one of the nine assigned topics.)

Chapter 3

Technical Brief Set Three - Topic 3: Internet 2 - Multimedia Enabler

As multimedia distribution moves away from CD and DVD discs to Internet-based delivery, the need for large aggregate I/O bandwidth and QoS become significant (Vernick et al., 1996). In many cases Internet applications and bandwidth are too slow to support advanced Web-based multimedia activities. The Internet2 project's goal is to solve these problems and provide the infrastructure required now and in the immediate future (Gaston, 1998). In the following pages, this brief discusses the primary goals of the Internet2 project and the advanced applications it will develop.

Internet 2

Internet2 has three primary goals. First is to provide leading edge network capability for the national research community. Currently the research community relies upon the network services of the National Science Foundation's NFSNET. The NFSNET backbone was created in 1985 to carry research and education traffic (Gillespie, 1997, February). However, privatization of the network and the inability of its commercial replacement to handle network congestion are depriving faculty of the network capability required to do innovative research.

The second goal is to focus on network development research that will allow next generation applications to take advantage of media integration, interactivity, real time collaboration, and tele-immersion (Stevens, Woodward, DeFanti, & Catlett, 1997). This work is essential to meeting educational goals set forth in distance education and national

research. The third goal is to transfer the technology developed and lessons learned quickly over to the Internet for educational use at all levels worldwide.

Advanced Internet2 Applications

In addition, Internet2 will create application development tools that take advantage of Internet2 high-speed network services and distributed storage infrastructure (Dempsey, Beck, & Moore, 1999, August 11-14). These tools will be developed in the process of creating certain advanced applications. Examples of Internet2 applications are Learningware and the Instructional Management System, Digital Libraries, Tele-immersion, and Virtual Laboratory.

Learningware

Most instructional software employed today is designed for stand-alone use. Internet2 provides the infrastructure to work on applications that employ the use of distributed learningware. Component technologies are the key building blocks that will allow networked learning materials to be more easily developed. These technologies include Distributed System Object Model (DSOM), Java, Active-X, and OpenDoc. Internet2 will provide an environment for these technologies to fully develop.

Internet2 will also help design a network-based, instructional management system called IMS. IMS is a hybrid between the highly structured classroom and a total lack of structure normally associated with web surfing. IMS is made up of both standards and services. The standards will allow distributed modules to interoperate with one another.

Digital Libraries

The existing Internet provides an environment for developing digital library systems. Examples include the ARPA/NASA/NSF sponsored Digital Library Programs.

These programs allow online access to catalogs, indexing databases, and full text journals. However, they also suffer from the reliability and performance problems of the Internet. Internet2 plans to move the Digital Libraries program into new areas.

The very high bandwidth and bandwidth reservation environment of Internet2 will allow continuous digital video and audio to become broadly used. Images, audio, and video will move into territory currently occupied by text. Internet2 will also provide sufficient performance at the desktop to evaluate information visualization technologies.

Tele-immersion

Another Internet2 application is tele-immersion. Tele-immersion is the combination of cave-style immersion technology, advanced high-speed telecommunications systems supporting collaborative applications, and extensions of current cave technology to recognize the presence and movement of other individuals in the cave. Tele-immersion allows individuals at different locations to share the same virtual environment. However, such an advance application requires infrastructure with high bandwidth, low latency, and time-dependent synchronous communications characteristics. Internet2 will provide this infrastructure.

Virtual Laboratory

Internet2 will support the development of virtual laboratories. Work within a virtual laboratory requires massive simulations that are supported by multiple supercomputers working in concert. One example would be the use of a virtual lab to perform multi-disciplinary design of a large and complex product, such as an automobile. The design and simulation process would require simultaneous access to hundreds of subcomputations.

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