

Technical Briefs #1

by

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Multimedia Risk Management Techniques

When managing a multimedia project, three fundamental risks must be taken into account. They are technical, cost-related, and schedule-related risks. Technical risks relate to the performance of the software product, how well it functions, how reliable it is, and how user-friendly it is. Cost-related risks mainly include all budget costs, fixed and variable, and how these affect the profit margin. Lastly, schedule-related risks specifically deal with how well the milestones are being met and how flexible and realistic the milestones are (Tannenbaum, 1998).

Generally, when undertaking a multimedia project, one would use the spiral approach. This is where each phase of the project is evaluated to identify risks, resolving them, or proposing alternatives. However, the first item that should be done is clearly stating what is being provided in a scope of work. The scope of work is similar to a proposal. It is a document that defines what the client needs and wants with an outline of the proposed structure along with proposed human resources that are needed, and the cost/payment structure as well as any limitations (England & Finney, 1999).

This scope of work not only lets the customer know what is and is not included in the contract, but can also be used to control costs as well as any changes to the scope. It is the main foundation of the multimedia project. Having a clearly defined scope of work is the first step in reducing the three fundamental risks in any multimedia project.

Another approach that can be taken to reduce risks is to have a concurrent engineering session with the client (i.e. customer). Before any work is even started, a couple of weeks are taken where everyone gets together to discuss what is expected from the multimedia project. During this planning stage, the client can express his/her ideas

and the developer can suggest approaches to those ideas. By involving everyone, it creates a sense of "ownership" of the project. Each member is key to making it successful. After this concurrent engineering session is completed, the developer should review the scope of work again and highlight any differences in costs, timing, and quality of product.

The project manager can utilize a work breakdown list to also minimize risks. This is a list where every step of the project is detailed as to what is required, what resources are required, what the costs are, etc. This work breakdown list is one of the most effective ways to avoid failing to meet the initial specification within the planned budget (Tannenbaum, 1998).

Other precautions that a project manager can use to reduce risks are the following: controlling the customer expectations, controlling the human resources, and making sure that the lead project manager is the only one making agreements with the customer. Controlling the customer expectations is not easy. That is why it is imperative to have the scope of work and concurrent engineering session to make sure the developer can meet the customer expectations. In addition, by reviewing each stage of the project with customer and making sure it meets his/her expectations can significantly reduce the technical, cost-related, and schedule-related risks.

One of the principal influencing factors to all those risks is human resources. The project manager must have control over peoples' time. Control of time is one of the biggest responsibilities (England & Finney, 1999). Without it, managing a multimedia project is almost impossible.

Lastly, the project manager should be the one making agreements with the customer. All too often, it is easy for other team members to agree to anything the customer wants especially during the concurrent engineering session. However, by other team members agreeing to do such things without taking into account the resources, cost, timing, etc., it can easily turn the multimedia project into failure. Ground rules should be set with other team members to how they communicate with the customer. In addition, all requests for changes should come through the project manager. Nevertheless, no changes should be made or agreed upon by any other person than the project manager. The project manager is and can be the only one who has final say.

In conclusion, in order to reduce risks the initial step is preparing a scope of work. Next, the project manager should hold a concurrent engineering session with the client. Upon finishing this session, a review of outcomes compared to the original scope of work should be detailed. Thirdly, the project manager should utilize a work breakdown list. Lastly, other precautions include controlling the customer expectations, controlling human resources, and making sure the lead project manager is the only one agreeing to changes.

References:

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Synchronization

Synchronization is the control of the temporal component in a multimedia production (Tannenbaum, 1998). The temporal sequence in which materials are presented is key to a multimedia presentation. There are at least two or more materials required for a multimedia presentation (i.e. video and sound). It is this sequence in which certain materials are presented at certain times in production, for a certain duration, and for a certain rate.

There are two main reasons why synchronization is important to multimedia. First, the temporal, content, and spatial components of the materials play an increasing role in determining the effect the production has on an user. Second, to achieve the desired synchronization effect in multimedia, the requirements for hardware and software resources grow significantly (Tannenbaum, 1998).

To deliver multimedia correctly to the user, synchronization is essential. To achieve synchronization in a multimedia production is difficult. There are processes as well as software products to help enable it.

Synchronization Processes

Several authors have developed models in handling synchronization. There are two distinct types of models. They are continuous versus point synchronization, and intramedia (serial) versus intermedia (parallel). Continuous is defined as the on-going temporal alignment of two data streams, whereas, point is the synchronization of the starting points of two data streams. Intramedia is the control of the rate of display of a sequence of images within a single data stream. Intermedia is the coordination of two or more separate media streams (Tannenbaum, 1998).

Recently, a "synchronization reference model" by Steinmetz and Nahrstedt has four layers of synchronization. Each layer provides an abstraction and separation of the synchronization process. For example, the media layer operates on a single continuous media stream. The stream layer also operates on continuous media streams as well as group media streams. The object layer operates on all types of media. Finally, the specification layer is an open layer that contains the tools and applications to create synchronization specifications (i.e. tools and editors) (Tannenbaum, 1998).

Additional work has been done in image synchronization also. There are three main synchronization models. They are shot, frequency, and counterpoint. Shot synchronization is the most basic synchronization method and is based on shot length. A frame mixer merges two video clips with given frame rates. Frequency synchronization gives transformational information (i.e. to shift, to reverse) to multimedia materials to synchronize their frequencies based on the counterpoint method. Counterpoint synchronization is not all parts of the whole music melody are equally synchronized but only the key points (Suzuki, Iwadate, & Minoh, 1999, October).

Understanding these models is difficult. This is why many companies, such as Macromedia, offer software programs that incorporate synchronization as part of the multimedia package.

Synchronization Products

Most multimedia developers leave the synchronization to system programmers who create programs that deliver synchronized multimedia. Today there are a few software packages available such as Director 8, Flash 4, Authorware, Quicktime, and Powerpoint. Each of these software packages creates an acceptable synchronized

multimedia production. Fortunately, commercially available multimedia software is constantly being improved as the available hardware speed and processing increases (Tannenbaum, 1998). These type of products save a developer time and money from creating the complicated synchronization process in a multimedia production.

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DVD and CD-ROM

DVD is the next “wow” product! Originally, DVD was defined as digital video disc (Tannenbaum, 1998). However, since this new technology became important to the computer industry as well as to the video industry, DVD is now defined as digital versatile disc (Rabinowitz, 2000). It was first introduced in 1995 because of the ever-growing size of multimedia files (i.e. audio, graphics, and video). Essentially, the DVD has the same dimensions as a CD-ROM, but with a larger storage capacity.

CD-ROM is the abbreviation for compact disc read-only memory. It is a type of computer memory in the form a compact disc, which is read by optical means. It was first introduced in 1982 for digital audio reproduction. It is only recently that the CD disc has gained industry acceptance due to its new CD-Recordable (CD-R) format (Unknown, 1999).

Even though these disc formats seem quite similar, there are functionality differences. In the next section, detail is given to how each format is organized. In addition, the advantages and disadvantages are briefly discussed.

Format Organization

The DVD as well as the CD uses a constant linear velocity technique to maximize storage on the disc surface. However, the DVD is capable of storing 28 times more data than a CD (Unknown, 1999). The reason is two key components are altered during the writing phase. They are the wavelength of the recording laser and the numerical aperture (n.a.) of the lens that focuses on it (Online, 1997).

The DVD uses a red laser with a wavelength of 635 nanometers and lenses of 0.6 numerical aperture. A CD uses an infrared laser with a wavelength of 780 nanometers

and lenses of 0.5 numerical aperture. These two factors affect the record marks on the disc surface. The DVD has record marks as small as 0.44 microns while the CD has .83 microns. Therefore, the DVD can store more data than a CD-ROM. The maximum storage on a two-sided DVD is 17 gigabytes (GB) while the CD-ROM can only store 680 megabytes (MB) (Rabinowitz, 2000).

Advantages & Disadvantages

It is clear that the main advantage of a DVD is the capacity to store data. This means that many applications will benefit, thus allowing more raw data such as MPEG-2 video, AC-3 surround sound, and 3-D graphics to be stored.

In addition to the large data storage capacity, this allows newer technologies to be enabled. Technology such as MPEG-2 compressed video playback can present video at a display resolution of 720 x 480 pixels. This is four times the current compressed video playback of MPEG-1 (Andrews, 1998, January 1).

Another benefit that the DVD has versus the CD-ROM is the ability to store data on both sides of the disc. The CD-ROM is only able to store data on one side; hence, it can have a label or other visible information on the other side. Unfortunately, the DVD cannot have such information since both sides of the disc are utilized for data storage (Online, 1997).

There are still some nagging problems with the DVD. Some DVD-ROM drives cannot read the CD-Recordable or CD-Rewritable media. Thus, there is no compatibility with some of the newer CD-ROM technologies (Andrews, 1998, January 1).

Another problem with the DVD is cable clutter. The DVD is enabling new

technology such as AC-3 audio. However, to achieve great audio output, one must manage all the wires and setup headaches.

Lastly, DVD standards seem to be in a state of flux. Several DVD manufacturers have split from the DVD Forum to make their own DVD specifications. Currently, there are three different schemes. They are DVD-RAM, DVD-Rewritable, and Multimedia Video File. Unfortunately, this has created a state of confusion in the marketplace (Andrews, 1998, January 1).

Conclusion

The new DVD technology is clearly a step beyond the CD-ROM. Even though it still has some problems, it is the key enabler of bringing multimedia into the marketplace quicker.

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