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Introduction to DVD

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DVD started out standing for Digital Video Disc, then Digital Versatile Disc, and now it's just plain old DVD. It is essentially a bigger and faster CD that is being promoted for entertainment purposes (movies) and some computer applications. It will eventually replace audio CDs, VHS and Beta tapes, laserdiscs, CD-ROMs, and video game cartridges as more hardware and software manufacturers support this new technology.

DVDs and CDs look alike. A CD is a single solid injected molded piece of carbonate plastic that has a layer of metal to reflect data to a laser reader and coat of clear laminate for protection.

DVD is the same size as a CD but consists of two solid injected molded pieces of plastic bonded together. Like CDs, DVDs have a metalized layer (requires special metalization process) and are coated with clear laminate. Unlike CD's, DVD's can have two layers per side and have 4 times as many "pits" and "lands" as a CD.

There are various types of DVD, including DVD-ROM, DVD-Video, DVD-Audio, DVD-R, and DVD-RAM. The specifications for these DVD's are as follows: for prerecorded DVD's; Book A - DVD-ROM, Book B - DVD-Video, and Book C- DVD-Audio. For recordable DVD's, there is Book D - DVD-R, Book E - DVD-RAM. The official DVD specification books are available from Toshiba after signing a nondisclosure agreement and paying a $5,000 fee.

The storage capacity of a DVD in relation to a CD is immense. For prerecorded DVD's, the storage capacity is as follows: DVD-5 (1 side, 1 layer) 4.7 Gb, DVD-9 (1 layer, 2 sides) 8.5 Gb, DVD-10 (2 sides, 1 layer) 9.4 Gb, and DVD-18 (2 sides, 2 layers) 17 Gb. For recordable DVD's, the capacity as of today is as follows: DVD-R, 3.8 Gb per side, and DVD-RAM, 2.6 Gb per side.

Now, let's take a look at each type of DVD, starting with DVD-Video. A DVD-Video can hold up to 17 Gb of video. However, no one to date has produced a DVD beyond a DVD-9, which holds up to 270 minutes of high quality video using MPEG2 compression. DVD-Video also supports up to 8 tracks of digital audio including Dolby Surround Sound. I will demonstrate the multi-language capabilities at the end of the presentation by having Mel Gibson speak

perfect French.

DVD-Video also supports up to 32 subtitles or karaoke tracks. This feature is a great benefit to those who want to be ADA-compliant. You can also have nine different camera angles. If you are watching a DVD-Video of a football game from the 50-yard line, you could switch the camera angle and watch from the end zone. Same concept the networks use, except you have control. Unfortunately, I won't be able to demo this feature as the only movies currently available with multi-angle features are from the pornography industry. DVD-Videos offer menus and simple interactive features as well as parental locks. If you have an R-rated movie, you can easily make it G-rated by locking out all R and PG frames. Other features such as fast forward or still frames plus more are available. DVD-Video supports widescreen and movies reconfigured for television viewing.

DVD-Videos came into the market in 1997 after the DVD manufacturers convinced the movie industry that copying movies would require very expensive equipment and would be extremely hard to accomplish (unlike VHS and Beta movies!). Eventually, DVD-Video will replace the VHS and Beta formats as more movies become available and more players are sold. Blockbusters is now stocking DVD movies in some of its stores as they also foresee the future. Movies are available for rent or can be bought for prices from $12.00 to $30.00. These prices will drop when the demand increases.

There is another product similar to a DVD called DIVX. These can be bought at Circuit City for about $5.00, which entitles you to view the movie once. With the DIVX player you can dial a phone number and request another viewing of the movie for another charge. I personally think that DIVX is the Beta version of DVD and will probably not survive as the prices of DVDs continue to drop.

Of greater interest to those in the library community is the DVD-ROM which will affect the publishing industry. A DVD-ROM can hold 4.7 to 17 Gb of data and has a transfer rate of 1.3 Mb per second. DVD-ROM supports both the micro universal disc format and the CD ISO9660 format. You can view CD's in a DVD drive but not the reverse. Naturally, high quality video, audio, and interactive features can be added to a publication making it very dynamic.

Video on CD-ROM was very limited considering the limited space. At this point there are not many DVD-ROM's available. One of the first DVD-ROM's was the United States white pages containing all the phone numbers in the U.S. These were originally sold on 5 CD-ROM's but now are available on one DVD.

DVD-ROM publishing in the Government is in its infant stage and very few have been published. One agency that is going to benefit greatly from the DVD technology is the U.S. Patent and Trademark Office (PTO), represented today by Mr. Cox, who will talk about the PTO and DVD following this presentation.

Some uses for DVD-ROM include training, large databases, and of course the games for kids and some adults like me. The Navy came out with a DVD in 1998 for medical training in the event of chemical warfare. It runs a trainee through a series of video scenarios, and the trainee must look at each video for clues to help determine if a chemical attack has occurred,

the severity of the injuries, and the proper way to respond. The Air Force also came out with a DVD in 1998 on the subject of ethics.

Basically there are seven steps for making multimedia DVD-ROM. One has to create or collect the data, video, and audio. A menu and navigational tree has to be developed. The media elements, such as compressing the video, must be prepared. All the data must be formatted for DVD and then a test disc is created. Copy protection can be added if required and then the discs are replicated and packaged.

The cost for authoring a DVD-ROM can run from $2,000 to over $50,000 depending on the features to be included on the disc. The replication costs, which are dropping, run about $2,000 for mastering the disc and $1.80 to $4.50 per disc (depending on the number of layers used).

There were some initial problems with DVD-ROM. In the summer of 1997 there was a "plug fest" organized by the International Multimedia Association where 40 DVD titles in development or in distribution were tested on DVD-ROM playback systems. Two thirds of the DVD-ROM titles that used MPEG2 video did not work, while 95% of DVD-ROM titles without video worked properly. Today's generation of DVD-ROM playback systems should have no problems running DVD-ROM with video. I have the first generation laptop with DVD and, unfortunately, I am unable to play any of the Government-produced DVD-ROMs.

The next type of DVD is the DVD-R or DVD-Recordable. The recorders are very expensive ($17,000); however, a $5,000 unit will be out shortly. The DVD-R discs cost approximately $50 per disc and currently hold 3.95 Gb per side (this will increase to 4.7 Gb by this summer). I suspect the cost of the media will also drop in time.

DVD-RAM, which is a rewriteable disc (in a cartridge), costs $25 to $40. The drives are less than $800 and can hold up to 2.6 Gb per side. At this time, many people have opted for the DVD-RAM as the costs are lower than the DVD-R. There are other rewritable formats such as DVD-RW and DVD-RW+ but it appears that DVD-RAM will lead the pack.

DVD-Audio, which will provide high fidelity, surround sound, and obviously longer playing features, will be coming out soon. The specification version 1.0 was just recently released.

Why bother with CDs when DVD is now available? In 1998 the projected sales of DVD-Video players was 1.2 million and 6.5 million for DVD-ROM players. According to the industry, CDs and DVDs will coexist until the year 2001, at which point the DVD player will become a standard for desktop and laptop units and more DVDs will be sold than CDs.

If you want more information on DVD, I suggest the following sources:

DVD Forum <**www.dvdforum.org**>, Optical Video Disc Association <www.ovda.org>,

SIGCAT <www.sigcat.org>, and for industry and market information <www.dvd.net>. GPO’s Institute for Federal Printing and Electronic Publishing is also offering a one-day class given by Ralph LaBarge, who is an expert in this area.

At this point, let me demonstrate some of the DVD-Video features and answer any of your questions.