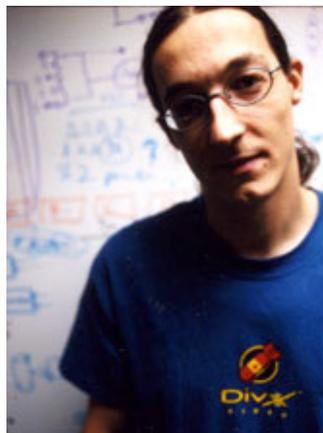


Digital Entertainment Post-Napster: Movies

By Thomas Bass November 2002



Movie maverick: Jérôme Rota, alias Gej, and his new company, DivXNetworks, hope to make movie downloading as routine as channel surfing. (Photograph by Chris McPherson)

DivX makes downloading movies easy. Should Hollywood be nervous?

Last summer's first two blockbuster films, *Spider-Man* and *Star Wars: Episode II—Attack of the Clones*, played on more than 3,000 movie screens and grossed more than \$100 million in their opening weeks. Impressive numbers. But not as impressive as the numbers generated by these movies' actual opening nights.

A bootlegged copy of *Spider-Man* appeared on the Internet the day before the movie premiered in theaters. A copy of *Attack of the Clones*—as if to mock its title—was widely available a week before that movie's scheduled release. From that virtual opening, which was accessible to half a billion people on their home computers, its Hollywood producers grossed exactly \$0.

Many bootlegged movies are "cammers," shot by digital cameras that had been sneaked into movie-screening rooms. The better copies are shot illicitly with cameras placed on tripods in the projection booth. The best ones are produced directly from studio prints or DVDs. Hopelessly dingy or surprisingly good, most of the copies have one feature in common. They are released in a format called DivX, a digital video-compression technology that shrinks movies into packages small enough to be sent over the Internet or stored on standard compact discs.

These Internet premieres mark a milestone in the long-anticipated "Napsterization" of the movie industry. Just as music file-sharing software allowed Internet users to send millions of bootlegged music files freely over the Web, DivX threatens to do the same for full-length films. "Hollywood's worst nightmare has come true," says Robert Batchelder, a research director in new media at Gartner, a consulting firm based in Stamford, CT. "You used to need a factory to make quality copies of movies. Now you just buy a computer with a CD burner."

Indeed, the analogy to Napster is apt. A computer makes no distinction between music and movie downloads, which differ only in size. A CD can hold about 650 million bytes of recorded music. A movie, which is far bigger, requires a DVD holding about 4.7 billion bytes, roughly seven times the capacity of a CD. Files that large can be sent over the Internet only if they are compressed. Compression involves chopping out redundant data and using mathematical and visual tricks that shrink an elephant to the size of a mouse.

Of the dozens of data formats for playing video on the Internet, DivX, which debuted in late 1999, was among the first and it is still considered the best for handling feature length movies. Companies such as Apple Computer, RealNetworks, and Microsoft may have pioneered commercial video formats, but for a long time they thought movies were too big and their Internet audience too small to be of interest. So, while Apple, Real, and Microsoft were concentrating on serving up small video files and streaming media, DivX, specifically tailored to films, quickly became the format of choice for compressing movies.

DivX got another jump on its competitors, which are now scrambling to catch up, with its successful launch this spring of DivX 5.0. The update gives movie aficionados a wide variety of choices for compressing their films and delivers images with near DVD quality. Sixty-five million people searched out and downloaded the new DivX software in the six months after its release. "There's no way to put the genie back in the bottle," says Batchelder.

Jérôme Rota invented—if that's not too grand a word for improving other people's technology—DivX in 1999. Rota, known at the time only by his Internet tag *Gej* (a Occitan word that means "crazy"), was a 27-year-old freelance video technician living in the southern French city of Montpellier. Over the summer of 1999, he had been using a beta-test version of Windows Media Player to compress and play his videos. When the official version of Media Player was released that October, however, Rota found it inferior to the earlier version. What had been a flexible tool, capable of adapting a variety of video formats, now worked only with Microsoft's proprietary software, and the files it produced were so big, he couldn't fit a movie onto a standard CD.

"I decided to set the information free," says Rota. He changed the installation instructions—a minor bit of programming—so that the new and old versions could work together. Then, by mixing and matching tools already on his desktop and by adding a few tweaks of his own, Rota created a codec—software for compressing and

decompressing digital media—that married MP3 audio compression to MPEG-4 video compression. Named DivX;- (that's DivX followed by a "wink," ironic homage to a failed video system developed by Circuit City), Rota's codec was engineered to fit movies into packages small enough to be sent over the Internet, downloaded, and played on a personal computer. He set up a Web site for distributing DivX in late 1999, and in the first week alone, the program was downloaded by 50,000 people.

After he released DivX, Rota, who was still known to the world only by his nickname, began receiving messages from people who wanted to form a business with him. The most intriguing proposal came from Jordan Greenhall, a Harvard-trained lawyer who had worked for MP3.com, an Internet music site, and InterVU, a company that specialized in streaming media over the Web. After corresponding by e-mail and instant messaging, Rota, Greenhall, and a third partner, Joe Bezdek, an engineer who had been Greenhall's college roommate, incorporated themselves in March 2000 as Project Mayo. "It's not easy to make nice mayonnaise," Rota explains. "It's like video coding. It may look easy, but it's not."

Project Mayo was a virtual company. The two Americans had never met their French colleague. The idea was to stay small and secret while they perfected DivX and figured out how to commercialize it. Rota had just landed a full-time job, and he had no intention of leaving France—until a reporter from the Wall Street Journal tracked him down. Afraid that Rota was about to be "outed," the three partners agreed in April 2000 to meet in San Diego and go public.

The Journal article appeared under a headline that announced that Hollywood was facing "The 'Napsterization' of Movies." (At its peak, Napster's estimated 80 million users were downloading 100 million songs a day.) Greenhall started fielding phone calls from venture capitalists, and by summer's end he had raised \$5.4 million in seed money to start a company called DivXNetworks. A second round of financing has since pushed investment close to \$12 million. Because it is inadvisable to found a company using technology borrowed from Microsoft, the first thing Rota had to do was throw out his software and start all over. The company released DivX Deux, or Open DivX, in January 2001. The software was free, and this time Rota included the source code.

But Rota and his partners had ambitions beyond being another outlet for open-source software. So while continuing to give away the basic DivX codec for free, DivXNetworks began building other products it could license or sell. In March 2002, DivX 5.0 debuted at a splashy party in a Los Angeles hotel. Even the basic free version of DivX 5.0 promised to shrink movies into ever smaller packages, transmit them at faster speeds, and play them back at higher quality. Over the next two days, Rota watched in amazement—and Hollywood watched in horror—as the new software was downloaded more than a million times.

Hollywood's panic is well justified. Apart from small distributors and a few other exceptions, none of the major studios has yet to release its films online. Last year, the Motion Picture Association of America mailed 54,000 cease-and-desist letters to Internet service providers that were found to be hosting pirated movies. This year the association expects to mail more than 100,000 letters.

But, the overall trend seems inevitable. "You can't file enough law suits to shut down all these sites," says Gartner's Batchelder. "There is a huge shadow economy, a parallel universe devoted to swapping DivX movies."

Divxnetworks is perched above the scrubby arroyos north of San Diego in one of the sprawling industrial haciendas that house the area's technology companies and surviving dot coms. I enter one of these low-slung buildings, which also happens to be where MP3.com got its start, and walk through a kitchen into a windowless cave the size of a basketball court. Large enough to hold most of the company's 34 employees, the room is filled with three rows of computer-laden tables. Along both sides of the tables is a phalanx of high tech Herman Miller Aeron chairs.

Rota is a tall, loose-limbed man who glides through space, peering quizzically at the world through black-framed glasses. His dark hair, pulled into a ponytail, frames his long face, and the hint of a smile tugs at the corners of his mouth. He is witty and irreverent, and he knows how strange it is for a former hacker from the media backwater of southern France to be living in California, snapping at Hollywood's heels.

In a conference room that holds two big television screens, *Bridget Jones's Diary* runs side by side in two versions. One is a store-bought DVD. The other is a compressed DivX video. At first glance, the two are nearly indistinguishable. When I open the cabinets under the televisions, I learn that the movies are playing not on video recorders but on computers. Industry wisdom says that video-on-demand will not become a mass phenomenon until someone supplies the electronic devices necessary for wiring televisions, personal digital assistants, and other consumer electronics directly to the Internet. And this is where DivXNetworks hopes to make its money. The company wants to see DivX technology built into every consumer product with a screen, allowing DivXNetworks to collect licensing fees and other payments.

This ambition pits the small startup squarely against some of the industry's giants. "I think it's going to be pretty tough," says Andrew Frank, technology officer at Viant, a media consultancy. "They're going head-to-head against Microsoft, and the best technology doesn't necessarily win."

The plan raises another question. Has Rota gone over to the "other side"?

"DivX wasn't designed as a tool for pirates," Rota says. "We saw what Napster was doing to the music world and didn't want to make the same mistake. I support free speech, but I don't support the pirate's idea of 'free speech,' which is nothing more than an ideological cover for stealing other people's stuff. You can't please only the copyright holders or only the end users who want everything for free," he says. "There has to be a third way, some middle ground allowing people to get movies on their personal computers."

Later, I sit at Rota's elbow as he plays the famous beach scene from *Apocalypse Now* over and over again, each time coding and decoding the scene by a different method. He is testing improvements for the next release of his software, evaluating the pixels in every scene frame-by-frame to see how good they look, using a kitbag of psychovisual tools to get the edges crisp. "There are many tweaks involved in increasing compression. We can make you think in your mind that one image is the same as another, even when it holds a lot less information," he says.

"A DVD is a 100-to-1 compression of the original film. A DivX video is a 10-to-1 compression of a DVD. By the end, you are dealing with an image that might have a thousand times less information than the original," Rota explains. The key is to pick the information that is most important for the viewer and allocate resources accordingly. Rota's tricks include pulling bits out of the background or reducing 50 shades of black to one, using the saved memory for better results such as highlighting people's faces. "Only recently have we had the kind of computer power that allows us to put psychovisual tools into our video compressions," he says. "Video compression used to be a mathematical problem. Then it turned into a medical problem. Now I read a lot of papers by scientists on the human visual system."

It is seven o'clock in the evening, and the room is filled with the screams of players being killed in an online video game called Unreal Tournament. Outfitted with headphones and pounding furiously on their keyboards, the company's employees, their Herman Miller chairs turned into personal military-command centers, are trying not to get wasted by the fearsome firepower of their enemies. Rota is good, really good, at weaving and ducking his way out of one tight scrape after another. Armed with a sniper rifle, he shoots madly, rushing to capture the flag that is out there somewhere.

Thomas Bass is the author of numerous books including *The Predictors* (Holt/Viking-Penguin, 1999) and *Reinventing the Future* (Addison-Wesley, 1994, 1995). His

articles have appeared in Wired, The New York Times, The New Yorker, Smithsonian and Discover.