INVENTING THE MOVIES

Hollywood's Epic Battle Between Innovation and the Status Quo, from Thomas Edison to Steve Jobs

BY SCOTT KIRSNER

★★★★★

From Edison to the iPod, from the Warner Brothers to George Lucas, the story of how the movies became America's favorite form of escapist entertainment – and retained their hold on our imaginations for more than a century – is a story of innovators prevailing again and again over skeptics who'd rather preserve the status quo.

Inventing the Movies unspools the never-before-told story of the innovators who shaped Hollywood: how a chance meeting at the Saratoga Race Track led to the end of black-and-white movies … how Bing Crosby brought you the VCR … how Walt Disney tamed television … how a shotgun blast signaled the end of hand-made models and the beginning of digital special effects … and how even the almighty Morgan Freeman had trouble persuading theater-owners that the Internet wasn't their mortal enemy.

Based on interviews with dozens of directors, cinematographers, studio executives, and technology entrepreneurs (including Steven Spielberg, the founders of Pixar, and Mark Cuban), *Inventing the Movies* is an important read not just for fans of Hollywood's history, but for innovators trying to make change happen in any industry.

★★★★★

First Digital Edition - *Preview*

Cover design by Lisa Foulger. Images: Edison's Kinetoscope, upgraded with audio (courtesy of the U.S. Department of the Interior); *Gone with the Wind*, in triumphant Technicolor (used with permission from Corbis); Apple chief executive Steve Jobs brandishing a new video iPod (used with permission from Reuters).

10 9 8 7 6 5 4 3 2 1

Contents

Introduction

Whenever you buy a ticket to see a movie on a Saturday night, the secret technological history of Hollywood is included free with the purchase price.

When you walk the downward-sloping aisle to pick out a good seat, you're doing something that Thomas Edison was convinced would never happen; although Edison was among the first to capture motion on film, he was sure it'd be more profitable to charge individual viewers to watch movies at personal viewing stations, rather than projecting images on a screen for a large audience.

The movie has sound because the Warner brothers, despite several failed attempts to improve the silent film experience by adding a soundtrack, tried one more time, and happened to hire an ebullient vaudeville performer named Al Jolson to star in one of their first talkies. Unless you're a classic film buff, the movie you're seeing is likely in color, and that wouldn't be the case were it not for a chance meeting at the Saratoga Race Track between Herb Kalmus, the founder of Technicolor, and Jock Whitney, a wealthy playboy who wanted to make movies. That encounter kept Technicolor from running out of money, and led to the making of *Gone With the Wind*, the 1939 blockbuster that finally convinced Hollywood to switch over to color.

Even if you decide to stay in on Saturday night and watch a movie, that's a choice that's linked to Hollywood's hidden technological history, too. Walt Disney and William Boyd (who played Hopalong Cassidy, the righteous cowboy) were among the first people in Hollywood to understand that television might actually represent a new business opportunity, rather than just a threat to ticket sales. Recorded movies on tape and DVD exist thanks to the patronage of Bing Crosby, who paid a team of engineers in the 1950s to develop the first prototype video recorder.

The story of how new technologies enabled Hollywood to become America's dominant culture factory, and remain in that role for more than a century, hasn't been told before. It's a story that's relevant not only to avid movie-goers and industry insiders, but to businesspeople, artists, and inventors working in any field who are interested in the relationship between innovation and the status quo. How does innovation ever prevail when just about everyone working in a given field would prefer that things remain the same?

Innovators rarely win on the merits of their idea alone, or on personal charisma – despite the wonderful fables recounted endlessly in business magazines and books. New ideas always encounter stiff headwinds. Some succeed, while others flicker and fade.

Hollywood is one of the best examples of an established industry (and the movies an established art form) that, like every established industry, relies on innovation for its survival, but resists innovation at every turn. That makes it an ideal place to explore the obstacles that innovators face, and the persistence, luck, and cleverness required to vault past them. It also offers insight into the mindset of those who fervently defend the status quo.

[2] INVENTING THE MOVIES

How did I stumble down this particular rabbit hole? After writing a few magazine articles about cinema and technology, and briefly working as a newspaper movie critic, in 2005 I was lucky enough to be invited to a gathering that the director George Lucas was organizing at his secluded Skywalker Ranch, in the emerald hills of Marin County. It was a one-day conference to explore the latest wave of technologies that were changing the way movies are made and experienced.

As I drove through the gates to Lucas' 4,700-acre homestead on a brilliantly sunny Saturday in late April, I wasn't sure who else would be there, but I'd been told that for the first conference Lucas had organized, two years earlier, Steven Spielberg, Martin Scorcese, and Francis Ford Coppola had all made the trip. I was nervous, and I had no idea about the dress code ("Auteur casual"?)

This time around, the cast of characters sipping iced tea in the library of the ranch's Victorian-style main house included Ed Catmull and John Lasseter, two of the founders of the pioneering computer animation company Pixar; Robert Zemeckis, the director who'd overseen the "Back to the Future" trilogy and won an Oscar for *Forrest Gump*; Robert Rodriguez, the fiercely independent director, cameraman, composer, and editor from Texas who'd totally abandoned film cameras for digital cameras with movies like *Sin City* and *Once Upon a Time in Mexico*; and James Cameron, director of the top-earning movie of all time, *Titanic*.

Standing toward the back of the library, seemingly rooted in place, was Lucas himself, wearing jeans and one of his trademark plaid shirts, sleeves rolled up to the forearms.

Like everyone else in the room, Lucas was a die-hard innovator. In the three-and-a-half decades since his making first feature film, *THX 1138*, he'd poured his energy and resources into developing new technologies to solve the creative problems he encountered, and allow him to put images on the screen that hadn't been seen before. Lucas had guided (and personally bankrolled) research-and-development projects to advance special effects, sound and picture editing, and cinematography; at almost every speech he gave, or every lunch meeting with a studio head, he harangued the rest of Hollywood to follow along.

Some of Lucas' efforts had been successful – Industrial Light & Magic, his special effects firm, had grown into Hollywood's leader in computer-generated visuals, with more than 1000 employees, a shelf-full of Oscars, and over $1 billion in estimated annual revenues – but others had left him feeling frustrated with the pace of change, like his push to persuade theaters to switch over to digital projection. He was a pioneer who'd learned through hard experience what it takes to make new ideas truly permeate an industry. And most of the other people at the conference came with similar war stories.

After lunch, the filmmakers and technologists walked over to a nearby building, and filed into the Stag Theatre, a sleek, Art Deco-style screening room. Like students hoping to avoid being called on by the teacher, the attendees occupied the back eight rows of seats, and left the rows in front empty. Lucas ambled to the front of the auditorium, and kicked things off by observing that Hollywood was still cool to the concepts of digital movie-making and digital projection. "The last time we had this gathering, I said that the next time, this theatre will be full of people who've accepted digital," Lucas said. Gesturing to the empty rows, he continued dryly, "As you can see, digital has been accepted wildly."

The afternoon was filled with show-and-tell presentations. Lucas talked about replacing hand-drawn storyboards, used for planning an action sequence, with digitally-crafted animations called "pre-viz," which offered a better sense of space, speed, and movement. Zemeckis and Cameron made the case that digital 3-D projection could help cinemas compete with the latest wave of high-tech, high-definition entertainment equipment that consumers were installing in their homes. Lasseter, who'd once worked for Lucas, showed a stunningly-clear digital clip from *The Incredibles* on the big screen, and compared it with a scratched-up film print that had just come back from a suburban multiplex. Rodriguez talked about blending live-action footage with virtual sets, built by expert programmers rather than master carpenters,

in *Sin City*. "I don't think I'll ever shoot on a real set again," he said. With virtual sets, he continued, "You can get it to look the way it looks in your mind."

All of the A-list directors who had converged at the ranch shared the same restless energy: like cinematic innovators stretching back to Thomas Edison and the Lumière brothers, they were eager to experiment with new tools and technologies that could stretch the bounds of what was possible on the screen, and deepen the immersive experience of entering a movie theater. But they needed others to buy into their vision and support them. One theme that kept surfacing was how difficult it could be to persuade others in their industry – whether equipment suppliers, studios, financiers, or cinema-owners – that a given innovation was worth the risk and investment it inevitably required.

"We all have bloody foreheads from beating our heads against the wall," Lucas said. "You've got to be patient. Keep beating your head against the wall, and eventually it will fall over."

Lucas was expressing the frustration that innovators feel in any industry when they try to introduce a new idea. Instead of being thrown a ticker-tape parade, they're often met with hostility or indifference. Sometimes, the status quo defeats the innovative concept, or at least delays its introduction.

In the course of my later conversations with Lucas, Cameron, Rodriguez, Catmull, and other Hollywood innovators (and in my interviews with people trying to make change in other industries), it became increasingly clear that successful innovators spend a lot of their time honing their ideas and products – but they spend even more time chiseling away at resistance. Yet most coverage of Hollywood and the wider business world succumbs to the "better mousetrap" mythology: if you invent something that makes someone's job easier, or creates new opportunities, they'll welcome it.

But the savviest innovators acknowledge that not everyone loves change. In their minds, the world can be divided into three groups:

- Innovators
- Preservationists, and
- Sideline-sitters.

Innovators and preservationists couldn't see the world more differently.

Innovators view change and new technologies as an opportunity. Preservationists view change as a threat. Innovators are willing to take risks that could lead them in new directions, creating new artistic possibilities, new businesses, or new revenue streams. Preservationists want to protect the way they do things today, the traditions they've grown up with, the skills they've learned, and the businesses they've already built. (For more on innovators and preservationists, see Appendices A and B.)

Between the innovators and the preservationists are the sideline-sitters: they aren't interested in having to learn something new or change the way they work right now (even though they know they may have to eventually), and they don't have the time to experiment with a new technology. They aren't active nay-sayers; they're simply content to wait to see how things pan out.

(In the movie industry, of course, the term "preservationist" also can refer to someone who works to make sure that important films are preserved for future generations; I'm using it here in a different way, to refer to individuals who seek to preserve the status quo.)

These three groups – innovators, preservationists, and sideline-sitters – exist in every business, and every art form. All change is the story of how innovators combine new ideas and new tools to create something spectacular and compelling, overcoming the resistance (whether active or passive) of the other two groups. In the end, the preservationists and sideline-sitters are often forced to acknowledge that those annoying, persistent innovators haven't destroyed the art form or damaged the business, but rather taken it someplace new, strengthened the bond with the audience (or the customers), and expanded the opportunities for turning a profit.

The weekend gathering at Skywalker Ranch – Lucas dubbed it simply the "Digital Conference" – was an invitation-only conclave of innovators. But in Hollywood, as in all other industries, the innovators are outnumbered. I encountered plenty of preservationists and sideline-sitters while researching this book, and writing articles for two of Hollywood's venerable trade papers, *Variety* and *The Hollywood Reporter*. Even in 2006 and 2007, they still weren't sold on the merits of shooting movies with digital cameras, distributing them to theaters via satellite instead of in battered metal canisters, or selling them directly to consumers over the Internet.

If I'd been working a hundred years earlier, I might've spoken to Edison about his opposition to the idea of projecting movies on screens; written about how Louis B. Mayer, the imperious head of MGM, stubbornly refused to attend a talkie; or interviewed Bette Davis about her reluctance to star in a Technicolor movie.

Although it may have a slightly higher glam factor than, say, the insurance business, Hollywood is a perfect case study for the way that any big, successful, well-established industry responds to new ideas. Over more than a hundred years of technological progress, as cinema has changed as an art form and matured as a business, there have been constant battles between the forces of innovation and the forces of preservation.

This book is a chronicle of those battles, and how innovations ultimately helped the industry survive and maintain its powerful connection with audiences. But it's also a parable for innovators, whether they are free agents, employees of small start-ups, or part of a big organization.

By traveling from the days when silent films were accompanied by the noisy whirr of a projector and the plink-plink-plink of a live pianist, to the era of the $100 million computer-generated spectacle made by Lucas, Cameron, or Pixar, projected digitally and accompanied by booming surround sound, we'll develop a better understanding of the brilliance, tenacity, and luck required of innovators – and the unpredictable obstacles they must overcome.

So, as the red velvet curtains part to reveal a blank silver screen, this is the story of Hollywood's battles between innovation and the status quo.

1: Inventing the Movies

The first people who ever paid money to watch a movie were Manhattanites who just happened to be strolling down Broadway on a Saturday afternoon.

The entertainment industry in 1894 was dominated by live performances. That year, the 1,100-seat Herald Square Theatre opened to the public with a production of "Arms and the Man" by George Bernard Shaw, which turned into the playwright's first major hit. The author Mark Twain spent several months in New York, giving lectures and readings. Ethel Barrymore made her first stage appearance, in a play called "The Rivals."

If anyone had tried to estimate the market potential for a new form of entertainment – visually-recorded performances which, unlike the live shows they competed with, were shown in black-and-white and had no sound – it would have been a zero-billion-dollar industry for the foreseeable future.

But two entrepreneurial siblings, George and Andrew Holland, were convinced that New Yorkers simply didn't know yet that it was their destiny to be cinephiles. The Holland brothers had rented a former shoe store at 1155 Broadway, just a few blocks south of where the Empire State Building now stands, and turned it into the world's first Kinetoscope Parlor. On the weekend of April 14, 1894, pedestrians lingered in front of the storefront in curious clots; no one had the slightest idea what a Kinetoscope was. The Holland brothers hadn't planned to open for business until Monday, but the early interest convinced them to unlock the doors two days early.

Greeting patrons at the entrance was a plaster bust of Thomas Edison, the Kinetoscope's inventor, painted to look like it had been cast out of bronze, and perched atop a Greek column to give the place an air of class. Edison was already famous as the inventor of the incandescent light bulb and the phonograph, and for the past six years, he and his team of engineers in Menlo Park, New Jersey had been working on technology to capture reality on film and then play it back.

Inside, customers encountered two rows of chest-high wooden cabinets: Kinetoscopes. Leaning against a brass rail that ran in front of the Kinetoscopes, a customer would look through a peephole at the top of the cabinet. Inside was a continuous loop of 35-millimeter film, threaded around a series of spools like a cat's cradle. The viewer looked into the Kinetoscope through a magnifying glass, literally examining individual frames of the film, lit from behind by one of Edison's miraculous light bulbs. A revolving shutter allowed each frame to be illuminated only briefly, the staccato flashes of light ensuring that one frame would seem to be replaced by the next, creating the illusion of motion. After each twenty-second long movie had finished, the machine stopped automatically, and the customer proceeded to the next Kinetoscope. Customers paid 25 cents to gain entry, which entitled them to watch all ten movies.

The novelty of life and motion stored inside a box and triggered on command – the startling realism of those flickery, black-and-white scenes – was what drew in customers, not the films being exhibited.

Among the movies shown at the Holland brothers' Kinetoscope Parlor were the aptly-titled "Roosters," "Trapeze," "Wrestling," and "Barber Shop." A few of the films on display featured celebrities of the day: the strongman Eugene Sandow, a German who was touted by Florenz Ziegfeld as "the modern Hercules," and a contortionist known as Madame Bertholdi.

By the close of the first day of business, nearly five hundred people had watched Edison's movies, and the Holland brothers had raked in $120. By May 1894, a second Kinetoscope parlor opened on State Street in Chicago, and in June, a third popped up in San Francisco. "Kinetoscope parlors were now the rage, and opened up across the country as fast as the Edison Manufacturing Company…could supply machines," wrote film historian David Robinson. Before the year was out, London had its first Kinetoscope parlor, too.

Edison's Kinetoscope films were shot in a large wooden shed in West Orange, New Jersey. Vaudeville performers and dancers made the journey across the Hudson River, as did Buffalo Bill Cody and the sharpshooter Annie Oakley. The camera filmed cockfights, and a dentist named Dr. Colton extracting a tooth.

Another set of siblings who'd visited the Holland brothers' Kinetoscope parlor, Otway and Grey Latham, were inspired by the technology. They imagined that they could attract an even bigger audience if, instead of capturing barbers and dentists at work, they used the Kinetoscope to show boxing matches. (At the time, boxing was illegal in most states, including New York.) So the Lathams founded the Kinetoscope Exhibition Company with a friend of theirs from the University of West Virginia. The trio persuaded the Edison Company to make some small changes to the original Kinetoscope, building a new model that could hold films as long as 150 feet, and slowing down the speed at which the film ran, so that the machines could show longer films. Their plan was to stage a boxing match between two prizefighters, with six rounds lasting a minute each.

When the Lathams' Kinetoscope films were put on display in August 1894, in a new Kinetoscope parlor in lower Manhattan, customers paid 10 cents to watch each round. (Some customers, short on cash or just impatient, skipped straight to the final round, and that film wore out most often.) Boxing on film was an instant phenomenon; the crowds spilled out onto the sidewalk. A later fight, between "Gentleman Jim" Corbett, the world heavyweight champion, and Peter Courtney, earned Gentleman Jim a royalty totaling more than $20,000.

After their success with the boxing movies, the Lathams became convinced that the next logical step for their business was to be able to show motion pictures to a group of viewers simultaneously. The Lathams set up a new company, called Lambda, to develop the technology they'd need.

But Edison wasn't interested. Incremental changes to the thing he'd already invented weren't a problem, but designing a projector would require a bigger financial commitment. It would upend his burgeoning business of selling Kinetoscopes to penny arcades. And Edison didn't think that the market for projectors would be anywhere near as large as the market for his high-tech wooden Kinetoscopes.

"We are making these peep show machines and selling a lot of them at a good profit," Edison said. "If we put out a screen machine there will be a use for maybe about ten of them in the whole United States. With that many screen machines, you could show the pictures to everyone in the country – and then it would be done. Let's not kill the goose that lays the golden egg."

At the time, Edison was not just an inventor, but also a manufacturer, selling Kinetoscopes, and a studio head, producing movies for them. Like the studio chiefs who'd succeed him decades later, Edison seemed to be hoping that technological progress would hold off, so it didn't pinch his profits. And he was

assuming that no new technology could ever vault past the existing technology's revenue-generating abilities. (Sometimes, innovators can behave like preservationists.)

Unfortunately for Edison, progress didn't pause. One of his former employees went to work for the Lathams, and on the side, one of Edison's chief technical lieutenants, who'd received some stock in Lambda, offered them important advice. (The cranky and self-aggrandizing Edison wasn't very good at sharing credit for "his" inventions with the rest of the Menlo Park team, which didn't help employee retention or loyalty.) There was no way to be certain that people would prefer a communal movie experience, with a bigger screen, to the Kinetoscope's private viewing experience – or to be sure that the goal was even feasible. The Lathams simply believed that it was, and started slogging toward it.

On April 21, 1895, almost exactly a year after the first Kinetoscope Parlor had opened, the Lathams demonstrated their new projector for the first time to the press. By May, they'd opened a storefront theater on Lower Broadway to show an eight-minute boxing film. (They'd also petitioned the governor of New York to film an execution at Sing Sing, but were turned down.) The image on the screen was dim and fuzzy. *Photographic Times* wrote, "There is considerable room for improvement and many drawbacks have yet to be overcome," before adding, "Quite a crowd of people visit the store ... making their exit wondering how it's done." A headline that summer in a Chicago newspaper tweaked the Wizard of Menlo Park: "Edison Not In It! Kenetoscope (sic) Outclassed by Prof. Latham's Newest."

In France, August and Louis Lumière had seen Edison's Kinetoscope, and they also decided to develop a way to project images on a screen. Before the year was out, they'd held their first public demonstration, in the basement of Le Grand Café in Paris, charging one franc for admission. The movies shown included slice-of-life snippets like *Men and Women Employees Leaving the Lumière Factory* and *The Sprinkler Sprinkled*. Within a week, police were called in to control the crowds forming outside the café.

Edison eventually realized that preserving the dominance of the Kinetoscope wasn't viable, and as the sales of Kinetoscopes began to slow, his company licensed a technology for film projection that had been developed by two inventors, Thomas Armat and C. Francis Jenkins, who'd met while studying at the cutting-edge Bliss School of Electricity in Washington, D.C.

In April 1896, their projector, now re-branded as "Edison's Vitascope," was demonstrated at Koster and Bial's Music Hall in Herald Square, and trumpeted as "Edison's Latest Marvel." (Koster and Bial's was eventually replaced by a retail establishment founded by R.H. Macy.) Armat personally ran the projectors for that first show. There were clips of dance routines that had been hand-tinted with color, and a film called *Rough Sea at Dover*. The New York *Times* wrote, "The waves tumbled in furiously and the foam of the breakers flew high in the air. So enthusiastic was the appreciation of the crowd long before this extraordinary exhibition was finished that vociferous cheering was heard." Through a smart licensing deal with Armat and Jenkins, Edison had managed to play technological catch-up.

The brothers Lumière brought their projector to New York in June 1896, and other projectors followed. Before long, vaudeville shows, circuses, amusement parks and magic lantern shows all began featuring moving pictures as a novelty. The Lumières provided a "complete package" to touring vaudeville outfits, including films, a projector, and a technician to oversee everything. At the Paris Exhibition of 1900, they set up a screen 80 feet high and 100 feet wide – larger than the biggest IMAX screen that would be in use a century later.

In Pittsburgh, the first nickelodeon – a small room in the back of a penny arcade – opened in 1905, showing movies continuously for a five-cent admission fee. Patrons could stay as long as they liked. Within two years, the proprietor had opened up fifteen others. By 1914, the number of nickelodeons exploded, to about 14,000. Singers entertained the audience while the reels were being changed. In the projection

booth, an employee cranked the projector by hand; it was a dangerous job, since the nitrate film stock was highly flammable, and if it was exposed to too much heat from the projector bulb, it would ignite.

"In cosmopolitan city districts the foreigners attend in larger proportion than the English-speakers," observed Joseph Medill Patterson, a writer for the *Saturday Evening Post*. "This is doubtless because the foreigners, shut out as they are by their alien tongues from much of the life about them, can yet perfectly understand the pantomime of the moving pictures."

That fact didn't escape a group of scrappy entrepreneurs, many of whom were recent immigrants themselves. William Fox, born in Hungary, began his career in the movies at age 25, buying a Brooklyn nickelodeon that was on the verge of closing. His business would eventually grow into 20th Century Fox. Among the others who got their start in the nickelodeon era were Carl Laemmle (founder of the Independent Motion Picture Company, which evolved into Universal Pictures), Marcus Loew (founder of Metro-Goldwyn-Mayer), Louis B. Mayer (MGM), Adolph Zukor (Famous Players, which later became Paramount Pictures), and the Warner brothers.

1902: The 200-seat Electric Theater, considered the first venue in the U.S. specifically built for the purpose of showing films, opens in Los Angeles. Admission is a dime.

But the novelty wears off quickly, and after just six months the proprietor converts the space into a vaudeville theater.

But almost from the very start, this cadre of entrepreneurs ran into roadblocks – especially if they wanted to be more creative in selecting the movies shown at their theaters, or even make their own product. By 1909, Edison and Armat, along with Biograph and Vitagraph, two other pioneers of the industry, formed the Motion Picture Patents Company to pool their patents on cameras and projectors, collect royalty payments, and "standardize" the industry. Producers would make a fixed number of movies, and release them on certain days of the week. The Trust, as the MPPC became known, made a deal with the Eastman Kodak Company so that Kodak wouldn't supply raw film to any producer not in league with the Trust. The Trust also bought up most of the companies that rented movies to theater owners in the U.S., which enabled the Trust to set prices and force theaters to take a specified package of films each week, whether the movies were any good or not.

The Trust didn't totally squelch outside activity; theater owners like Fox, Laemmle, and Zukor ignored the Trust's demands, making their own movies using cameras and film obtained on the black market, and creating underground distribution operations to supply their movies to theaters. They began making longer movies, adopted more sophisticated editing techniques, and built up the reputations of sexy stars like Theda Bara. ("The Vamp," as Bara was known, was especially popular for her skimpy costumes.)

While the Trust fixed the salary that could be paid to a talented director, the independents, as they came to be known, could dangle better pay. One of the most prolific directors churning out movies for Biograph (a member of the Trust) was a stage actor from Kentucky named D.W. Griffith. Over a four-year period, he made more than 400 short films for Biograph, before setting off on his own and taking his entire troupe of actors with him, in part because his employer didn't think that longer, feature-length movies were financially viable. (The actress Lillian Gish, who starred in many of Griffith's movies, added that Biograph executives "thought that a movie that long would hurt [the audience's] eyes.")

Trust members were serious businesspeople, focused on wringing the most revenue possible from the fast-growing movie industry, using technologies and filmmaking processes they'd already developed. Like all successful companies, they hoped for stability and steady growth, and that led them to presume that conditions in the market would stay the same, or change incrementally and predictably. They were skeptical that audiences would ever want to watch movies longer than about a dozen minutes; in contrast, the independents were willing to experiment, making movies that lasted twice as long, stretching over two reels of film instead of just one. Pretty quickly, they found that theaters showing them could raise their

admission price from a dime to fifteen cents by marketing the longer movies as "first-class" pictures, which returned more money to the independents.

Carl Laemmle was the independent who seemed to most enjoy tweaking the Trust. He hired an unknown-but-popular actress from one of the Trust's studios, who'd been known to audiences only as "Little Mary," and promoted her as Mary Pickford, one of the first movie stars. The possibility of fan worship hadn't occurred to the established powers; they dismissed the audience's affection for individual performers as a fad that would run its course.

"The real rulers of the [Trust] were not in touch with the consumers of their product. They never had been exhibitors, nor did they make any effort to discover what the public might happen to want," wrote historian Benjamin Hampton. (In the movie industry, theater owners have long been referred to as exhibitors.)

Edison had distributed the first true blockbuster movie, *The Great Train Robbery*, a 12-minute long Western. (It ended with a scene of a bandit firing a gun straight into the camera, a shot to which Martin Scorcese would later pay homage in *Goodfellas* and *The Departed.*) But the industry's second blockbuster, *Birth of a Nation*, came from an independent, Epoch, and was directed by D.W. Griffith, the ex-Biograph employee. With a budget of $110,000, and a running time of more than three hours, it earned more than $10 million at the box office. (And there were no complaints of eye fatigue from audience members.)

Now that they were making serious money, the independents could afford attorneys to battle the Trust. William Fox led the charge, launching a lawsuit alleging that the MPPC was in violation of the Sherman Anti-Trust Act; the suit (and the Trust members' reluctance to innovate) eventually eviscerated the Trust, and it was the independents, now ensconced in Hollywood, who achieved dominance in the motion picture industry. (Hollywood, they'd discovered, had better weather, cheaper land, and lower labor costs than the Northeast.)

But just as Edison and the other Trust members had grown resistant to new ideas once their business of making movies and selling equipment and film stock was established, some of the independents would eventually follow that same pattern when cinema shook off its silence.

• • •

As the movies gained in popularity in the first decade of the 20th century, inventors tried many different approaches to add sound, usually by forging a Rube Goldberg link between the projector and a record player. Inadequate amplification was one problem; skipping needles were another. The Cameraphone, Photophone, Synchroscope, and Chronophone all came and went quickly.

Edison, the proud inventor of the phonograph, had been interested in talking pictures from the moment he began work on the Kinetoscope; at his Menlo Park labs, there had even been some rudimentary experiments in the late 1880s. But synchronizing the image with a soundtrack was vexing, and an upgraded version of the Kinetoscope that included a record player in its wooden cabinet didn't even attempt it; the music was merely an accompaniment, heard through tubes that a customer inserted in his ears. (This can be thought of as the great-great-grandfather of Apple's video iPod.)

In 1913, abetted by his Barnum-esque promotional skills, Edison introduced the Kinetophone. "Talking Pictures. A Fact! A Reality!" the advertisements blared. "Thos. A. Edison startles the civilized world and revolutionizes the picture business with his latest and greatest invention…" The Kinetophone relied on wax cylinders for its soundtrack, and a taut pulley that connected the phonograph to the projector. While it worked fine in carefully-controlled demonstrations, in theaters it was booed by audiences when the sound diverged from the action on screen. Film historian Scott Eyman has compared the audio quality of

Kinetophone recordings to "a static-filled radio broadcast." Only 45 Kinetophones were ever sold, and *Variety* dubbed it "the sensation that failed."

Inventor Lee De Forest took a leap forward when he developed a method to record sound onto the same strip of film that held a movie's images, ensuring that the sound and picture wouldn't drift out of sync. De Forest's Phonofilm process used a device he called a "light valve" to convert the sounds captured by a microphone into varying densities of black and gray, which were printed onto the film alongside the picture. (His approach was called sound-on-film, or optical sound.) When played back on a projector, a light cell would interpret the shades of gray that were encoded on the film, and convert them back into sound.

Thirty-four theaters were converted to sound in the early 1920s using the Phonofilm system, and Calvin "Silent Cal" Coolidge became the first American president to speak in front of a movie camera. But no studio was willing to make movies using the system; the only movies ever made in Phonofilm were the shorts that De Forest and his partners produced. Their films lacked stars, and they lacked the studios' promotional abilities. The public still wasn't swayed, despite De Forest's technical advances.

Throughout the 1920s, movies were accompanied by pianists and the sound of audience members reading the words on the title cards to one another. Rival chains poached one another's best organists. In the nicer theaters, there were complete orchestras. While inventors were still striving to solve the problem of synchronization, many people had grown convinced that films were meant to stay silent. "We talk of the worth, the service, the entertaining power, the community value, the recreative force, the educational influence, the civilizing and commercial possibilities of the motion picture," wrote James Quirk, editor of the magazine *Photoplay*, in 1921. "And everyone has, singularly enough, neglected to mention its rarest and subtlest beauty: 'Silence.'"

Market research wouldn't have supported any effort to change the status quo. Exhibitors told MGM that if the studio made pictures with sound, they wouldn't book them. No one saw the audience as dissatisfied with the current product. Edison, after the failure of the Kinetophone, concluded that "Americans require a restful quiet in the motion picture theater, and for them talking from the lips of the figures on the screen destroys the illusion…"

"I wouldn't give a dime for all the possibilities of [motion pictures with sound]," declared Kodak founder George Eastman. "The public will never accept it."

10: Coming to Terms with the Net

In a suburb south of Los Angeles, it looked as though a band of cell-phone-obsessed nomads had set up camp in the parking lot surrounding an office complex: a small village of tents had sprung up overnight, and white trailers were parked in neat rows.

A yellow AMC Gremlin was being towed slowly around the neighborhood by a truck; inside the car were the actors Morgan Freeman and Paz Vega, and a movie camera was mounted on the bed of the truck to capture their conversation.

The movie they were making, *10 Items or Less*, tells the story of a famous actor (Freeman) who enters and then alters the life of a convenience store cashier (Vega). It was fairly typical for a low-budget movie made without studio support: costs were being kept under $10 million, the shoot would be completed in just fifteen days, and the script didn't call for any flashy visual effects or elaborate sets. (In 2006, when *10 Items* was made, the average cost of producing a studio movie was $65 million.) It was also being shot on 35-millimeter film, like most movies of its vintage.

What made this particular production unique was that it would be the first movie with recognizable stars, and made by an established director, Brad Silberling, to be offered as a legal Internet download only a few days after it debuted in movie theaters. (Silberling's last movie, *Lemony Snicket's A Series of Unfortunate Events*, starred Jim Carrey and had earned more than $200 million at the box office.)

Relaxing in his trailer, Freeman was sprawled out on a leather couch. Freeman and his producing partner, Lori McCreary, had created a partnership with the microchip company Intel to set up a Web site called ClickStar, which would offer the downloadable version of the movie, along with a selection of others. Freeman was convinced that new approaches to distributing movies – especially making them available in whatever form the viewer wanted, at whatever time – were "going to change the whole nature of filmmaking." The big unknown, he continued, was how soon it'd happen.

• • •

10 Items wasn't the first movie to devise a strategy to make the most of consumers' intense interest in newly-released movies.

Just one month before the*10 Items* shoot began, an even lower-budget movie, *Bubble*, had surfaced briefly in theaters. Like *10 Items*, it was made by a well-known director – Steven Soderbergh, who'd begun his career with *Sex, Lies and Videotape,* and had most recently made the sequel *Ocean's Twelve*, starring George Clooney, Julia Roberts, and Brad Pitt. But unlike *10 Items*, *Bubble*'s cast was made up of people who'd never acted before, and Soderbergh shot it with a digital camera. (It relied on a rig similar to what had been used for Lucas' *Attack of the Clones*, with a CineAlta camera from Sony and lenses from Panavision.)

The movie, about the tense relationship among workers in a doll factory in the aftermath of a murder, was financed by 2929 Entertainment, a production company founded by the technology entrepreneurs Mark Cuban and Todd Wagner. With Soderbergh's OK, their plan was to put *Bubble* in theaters on the same day that they aired it on a cable channel they owned, HDNet Movies. The DVD would show up in stores the following week, distributed by a new company that Cuban and Wagner had started.

Their experiment in releasing the movie through several avenues simultaneously – rather than sequentially, as was the standard practice – was motivated by three things.

One was a desire to promote their inter-connected businesses (Cuban and Wagner also owned the largest chain of independent theaters in the U.S., Landmark Theatres, which would show *Bubble*.) The second motivation was advertising-related: they felt it was illogical to spend money on two separate ad campaigns for a new movie, first to get people to see it in theaters, and then again several months later to get them to buy or rent it on DVD. The third reason was the tendency for Internet users, especially young men, to hunt down movies they wanted to see online, and download an illicit copy from file-sharing networks. More profit-driven rings of movie pirates produced DVDs and peddled them on the sidewalks of Manhattan and Beijing.

"Name any big-title movie that's come out in the last four years," Soderbergh said. "It has been available in all formats on the day of release. It's called piracy. Peter Jackson's *Lord of the Rings*, *Ocean's Eleven*, and *Oceans's Twelve* – I saw them on Canal Street on opening day. Simultaneous release is already here. We're just trying to gain control over it." Soderbergh predicted that within five years, all movies would be available on the day of their release in any format.

In 1955, NBC bought the rights to broadcast *Richard III* on the same day it premiered in theaters, paying $500,000. The movie was directed by Laurence Olivier, who also played the lead. While the television audience may have been as large as 40 million, *Richard III* tanked at the box office. And Olivier was disappointed by the broadcast: most of the blood and gore had been snipped by censors, and he was bothered by the commercial interruptions.

But while a few innovators such as Soderbergh and Cuban, or Silberling and Freeman, were trying to prepare for that eventuality and exploring the implications for their bottom lines, the major studios were sticking to their traditional releasing practices. Movies played in theaters first; four months later, on average, they were offered as DVDs, and after that, on cable; years later, they'd be shown on free television.

Studios continued sailing that course, despite evidence that hundreds of thousands of consumers were ignoring the law and using high-speed Internet connections to download movies before they were released on DVD. In the fall of 2005, a research firm called BigChampagne released an unusual Top Ten list: the most popular movies that were being downloaded illegally from the Internet. In position #1 was *The Wedding Crashers*, with an estimated 821,390 downloads in a single week; occupying the #10 slot was *Star Wars: Episode III – Revenge of the Sith*, with an estimated 687,477 downloads. Neither was yet available on DVD.

It wasn't only pirated movies that Internet users were watching, however. They'd begun to develop a taste for short, homemade videos posted on the Internet. Hollywood directors tended to dismiss these videos as "dogs on skateboards," since most were mildly amusing clips that lacked any sort of narrative. The camerawork was shaky, and the editing non-existent. (Many of the videos resembled the short films that had been made a century earlier by Edison's engineers: a single, unedited take of someone dancing for the camera, or doing a trick.) A Web site called YouTube launched in 2005, allowing Internet users to upload and store their videos for free, or watch videos that the site's editors spotlighted. It became a magnet for clips of the "dogs on skateboards" variety (as well as clips from TV shows posted without permission), and before long YouTube was the fastest-growing site on the Web.

The Internet wasn't a new technology; its roots dated back to 1969, as a project of the Department of Defense. In the mid-1990s, when companies like Apple and Progressive Networks began making it possible to deliver video files over the Internet, movie studios started to employ it as a promotional mechanism, offering trailers and clips from upcoming releases – just as they'd done with television 40 years earlier. But they were slower to explore the opportunity to deliver full-length features to Internet users, since that had the potential to disrupt the studios' existing businesses. How would it affect sales of videotapes and DVDs, they wondered, or change the value of their licensing deals with cable and broadcast networks?

Using the Internet to check e-mail and visit Web sites was becoming a daily habit, and a growing number of people had access to high-speed connections, which provided a better experience for viewing video (even if it still didn't equal TV's quality). Still, studios and the operators of theater chains didn't want to tinker with the established "theatrical release window" – the exclusive exhibition period guaranteed to theaters, before movies were available elsewhere. Even some directors spoke out against making movies available online, on television, or on DVD while they played in theaters. (The verb "preserve" popped up an awful lot in their comments.)

One of the first movies to be offered online in its entirety was Lance Weiler and Stefan Avalos' *The Last Broadcast*. Shortly after the movie was distributed to make-shift digital cinemas via satellite, the Independent Film Channel made a streaming video version available on its Web site, on November 15th, 1998.

Universal vice chairman Marc Shmuger told *Variety*, "We would like to preserve the windows where they're at now. We're not eager to push them forward any closer. We want to preserve the uniqueness of the theatrical experience." Dan Fellman, the president of domestic distribution at Warner Bros., drew an even sharper line in the sand: simultaneous release of a film in theaters and on DVD was simply "not going to happen at Warner Bros.," he told the *Hollywood Reporter*.

Major theater chains snubbed the notion of simultaneous releasing, too. AMC Theatres, Loews Cineplex, Cinemark USA, National Amusements, Regal Entertainment Group, and Pacific Theatres all declared that they wouldn't show movies that were available in the home market. "I just think it's a wrong-headed approach," said Tony Karasotes, chairman and CEO of Karasotes Showplace Theatres in Chicago, in the *Hollywood Reporter*. The release strategy for *Bubble*, he continued, "is ass-backwards, and I don't want to encourage that kind of approach, because I own motion picture theaters."

Among directors, M. Night Shyamalan, was the first to speak out against altering the windows. In the fall of 2005, Shyamalan gave a speech to theater owners at the ShowEast trade show in Orlando. (He was at the event to promote *The Lady in the Water*, his seventh film as a director.) He told the audience that he believed there was a "collective soul" that existed among the people in a theater. "The ideal form is the movie theatrical experience," he said. "If they try to convince us otherwise, they are lying."

"I don't believe this is inevitable," Shyamalan told the ShowEast attendees. "If this goes through, you know theaters are closing down. It's going to crush you guys." He'd earlier told the *Reporter*, "If there's a last film that's released only theatrically, it'll have my name on it. This is life or death to me."

Another speaker at ShowEast that year was John Fithian. He openly referred to the idea of eliminating release windows as a "death threat" against the exhibition industry. The traditional theatrical release, Fithian said, served as a promotional platform for new films, building awareness and helping studios sell DVDs.

Fithian acknowledged that if consumers were asked whether they wanted a new movie to be available in all kinds of formats on the day of its release, "their answer is 'yes.' But what if some of your local theaters go out of business, and you don't have the choice to see movies that way? Their answer changes."

But Cuban and Wagner felt simultaneous releasing could benefit theater owners. One idea they proposed: sharing one percent of a movie's eventual DVD revenues with theater owners who showed movies like *Bubble*, since by showing the movie they were helping market it (as Fithian rightly observed.) But when asked if he thought a simultaneous release could help exhibitors in any way, Fithian didn't need much time to consider the question. "No, I don't," he said curtly.

Cuban had five defiant words for the skeptics: "I don't give a shit." At every moment of transition, innovators have encountered doubters, he said. "You can't find a great business where somebody didn't say the exact same things at the beginning," Cuban said.

After all of the rhetoric had been thrown down, only 32 theaters agreed to show *Bubble* when it was released in January 2006 – and 19 of those were part of the Landmark Theatres chain that Cuban and Wagner controlled. With a budget of $1.6 million, the movie earned just $145,000 at the box office during its U.S. release, prompting snarky headlines like "*Bubble* Bursts." But Wagner later declared victory, claiming that DVD revenues and sales of foreign rights had helped the movie turn a respectable profit.

• • •

Around the time that the studios were laying the groundwork for Digital Cinema Initiatives, they were starting another joint venture to determine the best way to make full-length movies available online.

Disney chairman Bob Iger was the only studio chief to publicly express interest in tinkering with movie release timing in the Internet era. "I think windows in general need to change," Iger told Wall Street analysts in mid-2005. "They need to compress. I don't think it's out of the question that a DVD can be released, in effect, in the same window as a theatrical release, although I'm sure we will get a fair amount of pushback on this from the industry." Within days, John Fithian, president of the National Association of Theater Owners, labeled Iger's comments a "death threat" against his members.

The venture, which was named Movielink, was in development for almost two years before it launched a Web site in November 2002. The studios, with Sony as the prime mover, selected as Movielink's CEO Jim Ramo, a careful and conservative executive who'd been part of the founding team at DIRECTV, the satellite television service. (Another site for legally-downloaded movies, CinemaNow, began offering full-length features in 2000 – mostly in the martial arts and horror genres. It had been funded by the independent film company Lions Gate Entertainment and Microsoft.)

While Movielink was in the works, the studios decided to start battling underground file-sharing networks where users could search for and download digital copies of movies for free. The Motion Picture Association of America, the lobbying group backed by the six major studios, joined forces with the music industry's lobbying group to try to shut down several file-sharing services that both viewed as major copyright-infringers. They targeted services like Grokster, based in the West Indies, KaZaA, based in Amsterdam, and Morpheus, based in Tennessee. One suit called the services a "21st century piratical bazaar where the unlawful exchange of protected materials takes place across the vast expanses of the Internet."

A month before the Movielink service was launched, the MPAA also sent letters to more than 2,000 colleges, alerting them that their students had been using school networks to swap illegal copies of movies; while the letters didn't threaten a lawsuit, they asked school administrators to do their best to stop the illegal activity.

At the outset, Movielink was more notable for what users couldn't do than what they could. The site offered "more than 170" titles, including *Harry Potter and the Sorcerer's Stone, Psycho*, and *A Beautiful Mind*. (There were no titles from Disney or Fox, which were exploring whether to create a download service of

their own. That never happened, and Disney and Fox titles showed up on Movielink in 2003 and 2005, respectively.) Only users in the United States could access the site, and then only if they had a computer running Microsoft's Windows operating system. Once a user began playing a movie, she had to finish watching it within 24 hours, or else the movie would expire. There was no way to download a movie in digital form and keep it in a collection for repeated viewing.

The number of movies in the inventory grew slowly, too, since the studios couldn't just hand movies to Movielink; making a movie available required the attention of attorneys who needed to make sure the studio had the rights to deliver the movie online. Getting those clearances, Ramo complained, was expensive and time-consuming.

The studios "almost certainly know that Movielink won't make them any money," Hollywood journalist Ben Fritz wrote in 2002. The site, he said, was "pure PR." "Movielink's primary purpose…is to demonstrate that the studios are providing a legal alternative for Internet movie pirates."

Meanwhile, in Silicon Valley, a start-up company had just raised $82 million by going public, and its plan definitely did involve making money.

The company had chosen the name Netflix because its founder, Reed Hastings, knew that movie delivery would eventually take place over the Internet. But for the time being, Hastings believed that delivering DVDs through the mail was less expensive, and would give him access to a vast audience: the 110 million homes served by employees of the U.S. Postal Service. For a monthly subscription fee of about $20, Netflix members could rent and return as many DVDs as they wanted each month – and hold onto a disc until they got around to watching it, without incurring any late fees.

Netflix also offered more than 11,000 different movies – far more than Movielink, CinemaNow, or other movie download services. Netflix didn't have to secure special rights or guarantee the studios a minimum amount of revenue from each title, as the download services did – all it needed to do was purchase copies of the DVDs it wanted. (With most studios, though, Netflix signed revenue-sharing agreements that gave the company access to large numbers of discs when a popular movie was released, and gave the studios a percentage of the rental revenues in return – a very symbiotic relationship.)

"We see our future as the downloadable DVD," Hastings said in 2001. "Our ten-year plan is to be the world's leader in that. But the way to win is not to focus on the technology. It's to get the customers – a couple million subscribers, who are addicted to the Internet for choosing their movies. Those are exactly the people who will do downloading. It's the customer relationship that will be valuable."

Hastings said he was happy to see the other downloading sites getting started, but that Netflix wasn't in a rush to deliver movies that way. "They're going to spend the bucks necessary to create a market in downloading," he said. "But we have no fear. Video rental is a $10 billion market today. We may wait for downloading to be a $1 billion market, and someone has to go and create that market. Those are expensive investments." He didn't plan to be the technological innovator, but instead intended to poach customers from traditional video rental stores. Netflix started 2002 with half a million subscribers, and had hit the one million mark by 2003.

• • •

To the studios, Internet services like Grokster, KaZaA and Morpheus were starting to resemble a threat from 20 years ago: the VCR. And Jack Valenti, on the verge of retiring as the CEO of the MPAA, was once again mounting a vigorous defense.

"There are more than nine and a half million broadband subscribers now," Valenti said in 2002. "Once those large pipes and high-speed access subscribers begin to increase, we can be terrorized by what's going on."

"In a digital world, who on earth is going to invest large sums of venture capital in a movie if they believe it is going to be ambushed early? The value of that movie is going to be diminished. You don't have to be a Nobel Prize winner to figure that out."

Valenti frequently quoted a statistic about how much money the U.S. movie industry lost to piracy. In 2004, the number was $3.5 billion a year, and that, he noted, didn't include Internet piracy – only illicit sales of bootleg DVDs and tapes. When the numbers were revised to include digital trafficking, they rose to an estimated $6.1 billion in annual losses.

Sid Sheinberg, Valenti's old ally from the Betamax battles, was now a producer, real estate developer, and philantropist. But he couldn't help noticing what was happening. "Somebody told me that Universal's remake of *King Kong* was lousy," Sheinberg said. "I said, 'Did you go to the premiere, a sneak preview?' They said they'd downloaded it. So you not only have the prospect of people seeing a movie before it's released, but they can also bad-mouth it before it comes out."

By some estimates, on file-sharing networks like Grokster, as much as 90 percent of the material being sent from one computer to another was protected by copyright. (The networks could also be used, of course, to send a home movie or a batch of high-resolution vacation photos – which would've been perfectly legal.) Some of the movies had been "ripped" from already-released DVDs and converted into digital files, but others came from videotapes made by someone operating a camcorder in the back of a theater. Valenti and the MPAA were on a mission to shut down the file-sharing networks. But several courts, referring back to the 1984 Supreme Court decision that allowed Sony to continue selling the Betamax recorder, ruled that the networks couldn't be held responsible for what users did with their software.

The MPAA didn't give up, and eventually, the case against Grokster and Morpheus, two of the most popular file-sharing networks, wound up in front of the U.S. Supreme Court. This time around, Sony (which now controlled a movie studio of its own, having purchased Columbia Pictures in 1989) had allied with studios like Disney, Fox, Universal, and Warner Bros. in branding a new technology as a threat to the business. And helping to finance the defense of Grokster and Morpheus was Mark Cuban, who worried that a victory for the studios would squelch innovation. As the majority of people's photos, music, documents, and video were stored in digital form, new networks would be needed to get them from place to place, Cuban thought.

"What innovations will be condemned by law before they have a chance to come to market because they could have an impact on Hollywood and the music industry?" Cuban asked on his blog. "We have no idea, and that is a very scary prospect."

On the steps of the Supreme Court during the Grokster case, a Grokster supporter with a sense of historical precedent handed Jack Valenti an old Sony Betamax tape, asking him to autograph the label. Valenti agreed, and within hours, photos of the signed tape were posted all over the Internet. (The tape contained a recording of Woody Allen's *Sleeper*, taped from a television broadcast.)

In June 2005, the Supreme Court issued a unanimous decision that diverged from its ruling on the Betamax case two decades earlier. A company that created a new technology "with the object of promoting its use to infringe copyright…is liable for the resulting acts of infringment," Justice David Souter wrote. The court didn't provide any sort of litmus test that would indicate whether the developer

of a new technology was actively encouraging its users to infringe copyright, however. The Grokster decision didn't undermine the Sony ruling from 1984, but it made the waters much murkier.

Dan Glickman, who had taken over Valenti's post in 2004, rejoiced, calling the ruling "a historic victory for intellectual property in the digital age. The Supreme Court sent a strong and clear message that businesses based on theft should not and will not be allowed to flourish," he said.

Morpheus vowed to keep pressing its case in the courts, but Grokster shut down its file-sharing service in November 2005, and paid $50 million to the movie and record industries in a settlement. The company posted a message on its home page that read, "There are legal services for downloading music and movies. This service is not one of them."

• • •

Around that time, Apple Computer mailed out a cryptic invitation to journalists. On the front were red curtains, and the words "One more thing…" Apple's CEO, Steve Jobs, habitually used that phrase to introduce a surprising new product at the end of his speeches.

With the media assembled in a San Jose theater, Jobs unveiled a new Macintosh computer, before discussing the company's portable music player, the iPod. Jobs said Apple had shipped almost 30 million of the pristine white devices. "It has been a huge success for us," he said, a wry smile on his lips. "And therefore, we're going to replace it." A new version of the iPod would store up to 150 hours of video, which could be played back on a screen the size of a Saltine cracker. (The solitary viewing experience harkened back to the days of Edison's Kinetoscope.) The price was $399 for the most capacious model. Apple also added television shows and music videos to its online marketplace, the iTunes Store, along with six short films from Pixar Animation Studios. (Jobs still served as CEO of that company.) The videos cost $1.99 – but unlike the rental movies on CinemaNow or Movielink, they belonged to the customer once the purchase was complete. Within 30 days, Apple announced that it had sold more than a million videos.

iTunes, Movielink, and CinemaNow began vying with one another to be the first to introduce various features. In 2006, Movielink and CinemaNow began offering full-length films for purchase, rather than rental; consumers griped that the downloads often cost more than buying a DVD at Amazon.com or Wal-Mart. CinemaNow was the first to allow its customers to burn a downloaded movie onto a DVD, so that it could be more easily viewed on the living room TV set. Amazon launched its own download service, called Unbox, in September 2006, and shortly after, Apple added full-length movies from just one studio, Disney, to its iTunes Store.

Other studios withheld their movies from Apple, both because they worried that the anti-copying "locks" integrated into iTunes' digital files weren't tough enough, and because they didn't want Apple to become the sort of dominant digital retailer with movies that it had become with music – a kind of Wal-Mart of the Internet. (In 2006, Apple sold about 67 percent of all digital music downloads.)

Quickly, that started to look like a mistake. After the first week of movie sales on iTunes, Bob Iger, Disney's CEO, announced that the studio had sold 125,000 downloads, generating $1 million in revenue. He said he expected iTunes to generate about $50 million for Disney over the coming year.

Andre Blay, the first videotape dealer, was semi-retired, but he saw most of the studios fretting once again that "their golden goose is going to be hurt, that the Internet is going to be disruptive rather than supportive. But my instincts tell me that sometime in the next ten years, the Internet will be a major source of revenue for the studios."

None of the other download services released information about how many movies they were selling or renting. Four months after it started offering full-length films, Apple said it had sold more than 1.3 million of them, knighting itself "the world's most popular online music, TV, and movie store" in a press release. Slowly, other studios began to put their wares on the shelves of the iTunes Store, starting with MGM and Paramount.

2006: Hollywood studios announce they will no longer release new movies on VHS tapes, slightly less than ten years after the DVD format was first introduced.

Jobs had a clear vision for making entertainment products, whether movies, songs, or TV shows, easier to buy in digital form than they were to obtain from one of the illegal file-sharing sites. He simplified pricing: TV shows cost $1.99, older movies were $9.99, and new releases were $14.99. All the content was fluid: it moved easily from a computer to an iPod. (There were even rumors that Apple was developing a new device that would sit atop a television, and allow consumers to watch iTunes content in the living room.) The studios didn't want to let Apple develop into a gatekeeper, but that seemed to be happening anyway, by virtue of the new approach to buying and consuming digital entertainment the company had pioneered. Jobs' influence in Hollywood seemed like it would only grow. In 2006, he joined Disney's board of directors, once Disney's acquisition of Pixar was finalized.

Movielink, meanwhile, was lagging behind, renting or selling only about 75,000 movies a month.

The studios hired an investment bank to try to sell the joint venture, but discussions with prospective buyers like Blockbuster, Comcast, and AT&T went nowhere. Ramo's allowance was running out: he had spent most of the $150 million in start-up funding that Movielink had been given by the studios. When Blockbuster sniffed around Movielink a second time, the price tag mentioned was $50 million. And when the video rental chain finally bought Movielink, to make digital movie rentals available to its customers, the *Wall Street Journal* reported that the deal was a fire-sale, valuing Movielink at just $20 million.
As the download services were trying to win over consumers, Hollywood was also introducing two new physical media products: high-definition DVDs called Blu-ray and HD DVD. By packing more digital data onto the surface of the disc, both offered crisper images than a standard DVD (and certainly better resolution than the Internet sites offered – legal or otherwise.) The studios' hope was that as consumers' purchasing of DVDs started to level off, the high-definition discs (priced as much as $10 higher than regular DVDs) would encourage them to keep buying – and perhaps even replace some of their existing DVD library.

But despite the fact that both formats relied on the same technological advance – a blue-violet laser that could read more information from the surface of the disc than the red lasers built into older DVD players – the Blu-ray discs wouldn't work in HD DVD players, and vice versa.

Sony Electronics led the group promoting Blu-ray, and Toshiba the HD DVD camp. HD DVD hit the market in the US first, in the spring of 2006, and the HD DVD players were about half as expensive as the Blu-ray players that arrived later in the year. Disney, Sony Pictures, Fox, and MGM decided to release their movies on Blu-ray discs, and Universal Pictures supported HD DVD. Paramount and Warner Bros. opted to release movies in both formats.

To help the Blu-ray format find its way into consumers' homes, Sony decided to integrate a Blu-ray player into its PlayStation 3 gaming console, which went on sale before the 2006 holiday season – even though the high-definition capability would bump up the price of the console.

Numerous attempts to combine the two formats failed. Warner Bros.' home video division developed a disc called Total HD that contained a single movie in both formats, one on each side; LG Electronics announced a player that could play both kinds of discs.

But as they'd done when they were offered a choice between the incompatible Betamax and VHS formats thirty years earlier, consumers largely decided to postpone their purchases of a high-definition DVD player. "One would hope that we'd learn from history, but sadly, sometimes we don't," said Pat Wyatt, a former president of Fox's home video division. Forcing retailers to decide which format to carry, and forcing consumers to guess which format would prevail – or risk being stuck with an obsolete high-def DVD player – quickly started to look like a losing proposition.

• • •

Consumers seemed to be falling out of the habit of going to see movies in actual movie theaters. The reasons were debated endlessly over lunches in studio commissaries. In 2005, 1.4 billion movie tickets were sold – the lowest total since 1997. One possibility was that Americans were spending more time on the Internet (perhaps surfing the Web, playing games, downloading free videos to watch, or tracking down pirated movies from the file-sharing sites.)

But another possibility was that people were setting up home theaters that were becoming their first-choice venue for movie-viewing, liberating them from sticky floors and fellow patrons who answered cell phones during climactic moments. They were popping in DVDs from Netflix, or ordering movies through their cable or satellite provider's pay-per-view service.

An Associated Press-AOL poll found that 73 percent of adults preferred watching movies at home. Newspaper stories profiled consumers who were investing more than $10,000 in their home theater systems – which inevitably led to fewer visits to the local multiplex.

Just as some actresses had expressed their reluctance to appear in a Technicolor production in the 1930s, as television switched to high-definition broadcasting in the early part of the 21st century, actresses were once again speaking out – and taking action. Blythe Danner said she was "appalled" by how she looked on a cable TV show broadcast in high-def. "I don't think I am terribly narcissistic, but you don't want to look your worst." Danner admitted to seeking "a little [cosmetic] help" after seeing the broadcast.

A Canadian company even introduced a line of make-up called "blu_ray," intended to help women look better in front of the all-seeing digital lenses.

In a front page story headlined "Why movie fans are staying home," the San Jose *Mercury News* profiled a California family that had purchased a $13,000 home theater system. They'd once gone to the movies almost every weekend, but now, they preferred to watch DVDs with their new surround-sound speakers turned up high.

One response to the increasing quality and plummeting costs of home theater technology was the second coming of 3-D. Dimensionality wasn't something that a home theater system could offer (yet), and the new digital projectors could offer a crisper 3-D image than what had been possible before.

For *Chicken Little*, a Disney cartoon released in late 2005, Dolby Laboratories and Real D, a California start-up company, outfitted 84 theaters in the U.S. to show the movie in digital 3-D.

They used a single digital projector showing 144 frames each second – half of them intended to be seen by an audience member's left eye, and half by the right. Dolby spent $7 million installing servers and projectors in the 84 theaters, and theater owners spent about $25,000, on average, for each auditorium that received the upgrade. That money paid for modifications to the projection booth, new silver screens, and special 3-D gear from Real D that polarized the images coming out of the projector. Audience members received a pair of green plastic 3-D glasses that resembled those worn in the movie by the lead character, and the glasses' polarized lenses ensured that each eye saw only the frames intended for it – which produced the illusion of depth.

Disney and Dolby branded the *Chicken Little* release a success, though the reality was a bit hazier. The movie earned $40 million in its opening weekend, and more importantly, the version shown in digital 3-D generated more revenue than the 2-D version. During the opening weekend, *Chicken Little* grossed about $11,000 per theater in 2-D, but $25,000 per theater where it was being shown in 3-D. (And the difference wasn't just due to the fact that some theater owners were charging $1 or $1.50 more for tickets to the 3-D screenings.) But the *Hollywood Reporter* said that it had cost Disney about $8 million to have the 3-D version of *Chicken Little* produced by Industrial Light & Magic.

"This chicken has legs," Disney distribution chief Chuck Viane boasted after the movie's opening. He had committed Disney to producing a string of movies in digital 3-D, just as the studio had promised several years earlier to provide a consistent supply of digital cinema releases.

One person who viewed the *Chicken Little* results as a half-empty glass was John Fithian. He observed that theatre owners would have to bear the cost of the Real D equipment necessary for 3-D screenings (not including the cost of the digital projector or servers). "As a technical proposition it is way cool," he told the Los Angeles *Times*. "As an economic proposition it clearly doesn't work everywhere."

But some directors and producers were getting excited about digital 3-D.

Producer Jon Landau compared the transition from 2-D to 3-D to the shift from mono to stereo in the recording business. "We think of movies as a great visual presentation, and there has been no quantifiable advancement in the visual presentation of the movies since the late 1950s," he said. "With music, why did we go to stereo? It heightened the experience. 3-D is like visual stereo. It'll heighten the experience that much more, whether you're making a drama, a tragedy, or an action movie. It's not about gags coming off the screen. It's about creating a window into the world, so that the screen goes away."

2007: More than 10 percent of the 35,000 movie screens in the U.S. can now show digital releases, due in large part to the aggressive conversion campaign of a New Jersey company called Access Integrated Technologies. Access predominantly uses projectors made by Christie Digital.

Landau was working with director James Cameron to make the science fiction movie *Avatar* in digital 3-D. They were shooting with a new camera system, called the Fusion and based on a pair of digital cameras from Sony. Cameron had designed it, in collaboration with Vince Pace. At DreamWorks Animation, Jeffrey Katzenberg announced plans to release its future movies in digital 3-D, starting with 2009's *Monsters vs. Aliens*. Other directors, including George Lucas and Randal Kleiser, had allowed a start-up company called In-Three to convert portions of their older movies (including *Star Wars: Episode IV* and *Grease*) into digital 3-D, with an eye toward eventually re-releasing the movies.

• • •

Not long after YouTube launched, allowing anyone to publish video content to the Web, other video sites began to appear that allowed anyone to edit video online. These sites, which included JumpCut, EyeSpot, and Motionbox, offered fewer advanced features than systems like Final Cut Pro or Avid, but they had the advantage of being free – and users didn't even have to supply their own footage to edit; they could play with music and video footage that had been uploaded by others.

Bands began inviting their fans to use the sites to assemble music videos, supplying the soundtrack and some generic video clips. One independent producer/director, Leone Marucci, used one of the sites to solicit audition videos for a bit part in one of his upcoming movies. Would-be supporting actors and

actresses could edit their audition videos together with footage that Marucci had supplied of the movie's stars reading their lines, in a scene set in a pizza shop.

One well-known independent director, Richard Linklater, agreed to allow his fans to use JumpCut to edit together their own version of a movie trailer for *A Scanner Darkly*, a dystopian animated movie scheduled for release in the summer of 2006. The editor of the best trailer would win a trip to the movie's premiere. The contest generated hundreds of trailers promoting the movie, at little cost to the studio that released it, Warner Independent. Editors who created the trailers no doubt showed them to friends and family members, creating a grassroots marketing campaign for the movie.

2007: Netflix begins allowing its subscribers to view movies on its site in digital form, through a feature called "Watch Now." Movies can be viewed on the Netflix site, but not downloaded for later viewing. Because of difficulty securing download rights, Netflix starts the "Watch Now" service with just 1000 titles, at a time when its DVD library contains 70,000 titles.

But many directors and studios worried about the loss of control inherent in giving amateur editors footage to play with – even if the potential existed to help build a larger audience for a given movie. "That's one of the reasons the Director's Guild of America exists," said Randal Kleiser, a DGA officer who helped to organize the guild's annual new technology showcase. Kleiser, who'd been in the vanguard of using computer-generated effects, digital cameras, and virtual sets, was responding to the idea that someday, dozens of editors might create dozens of different cuts of a finished movie, giving the studio dozens of different products to sell rather than just one: a shorter cut, a funnier cut, a more serious cut. "The DGA is there to prevent people from editing our work without our approval," he said.

• • •

In advance of its December 1, 2006 opening, Morgan Freeman made the talk show rounds to promote *10 Items or Less*. He was on "Live with Regis and Kelly" and "The Tonight Show with Jay Leno," and his co-star, Paz Vega, appeared on several second-string talk shows.

At the age of 69, Freeman said he was enthusiastic about the experiment's potential to help independent movies find new ways to reach audiences. "I'm just a firm believer that things continue to grow, get better," he said.

But like *Bubble* before it, theater owners froze out *10 Items*, since it'd be available on the Web site ClickStar just two weeks after its theatrical debut. (Online, the movie was priced at $11.99 for a 72-hour rental.) Only Mark Cuban's Landmark Theatres chain was willing to show *10 Items* in the U.S. The movie earned less than $100,000 during its U.S. theatrical run. But the movie made five times as much overseas – where would-be viewers weren't able to access to the ClickStar version.

Neither ClickStar nor Freeman ever released figures about how many people had rented the digital version of the movie, or how well the DVD release had performed. *10 Items* earned the distinction of being the first movie available legally on the Internet while it was still in theaters. But it was the second movie, after *Bubble*, to be boycotted by cinema owners for using a new technology in a way that seemed to threaten the stability of their businesses.