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## **Cinema in the Age of Digital Revolution**

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### **Abstract**

The third industrial revolution that is the digital revolution is a transformation from analog to digital technology. It is the beginning of the information age. Digitalization has gone to such an extent that there is shift to a digital film stock. Interactivity is another concept brought to forefront. There are positive as well as negative impacts on the society at large. Digitalization has made the art of film making more accessible. DVD releasing and internet streaming are frequent mode of exhibition. A new technology known as DIT came up with huge market demand.

**Keywords:** Projection, Democratization, CGI, Sensor, DIT

### **Introduction**

The Digital Revolution , also sometimes called the third industrial revolution, is the change from analog mechanical and electronic technology to digital technology that has taken place since about 1980 and continues to the present day. Implicitly, the term also refers to the sweeping changes brought about by digital computing and communication technology during the latter half of the 20<sup>th</sup> century. Analogous to the Agricultural Revolution and Industrial Revolution, the Digital Revolution marked the beginning of the information age. Central to this revolution is the mass production and widespread use of digital logic circuits, and its derived technologies, including the computer, digital cellular phone, and fax machine.

The digital revolution is in how films are seen and made is currently spelling a slow death for celluloid. Since the early days of photographic film in the late 19<sup>th</sup> century, moving pictures have been captured and then projected via some form of celluloid print. But with the advent of digital technology over the last decade the days of film-based production and projection are numbered. This also presents an interesting paradox what will we call films once they are no longer shot or projected on film.

As the scientific revolution took hold in the 19<sup>th</sup> century we discovered methods to capture images and sounds technologically. Photography, then records and film, reproduced reality without the intervention of words. But now we find ourselves on the verge of a new phase in the history of media. The languages which we invented to represent reality are merging. Film is no longer separate from print. Books can include movies, books. We call this synthesis “multimedia” or “new media”. The microcomputer revolution of the 1980s has increased our access to and control over information <sup>1</sup>.

### **PROJECTION**

From the early days of cinema until very recently light has shone through a piece of celluloid and the resultant moving image was then projected on to a cinema screen. In the last few years cinemas around the world have been gradually replacing the above method with digital projectors, which essentially replace cans of film with a large hard drive of data which is then projected via a computer system. Let’s think back to first four months of 1998 when Titanic was dominating the global box office. In cinemas around the world 35mm prints had been delivered in cans and spooled through projectors on to screens.

The mix of digital cinema projection began in 1999 just when digital optical discs were gaining traction in the home market with DVD format. Over the next decade, digital projection gradually became a reality. 2002 saw the major studios form a joint initiative to agree on technical standards and by 2007 many multiplex and art house screens in the UK began upgrading to digital systems. But for wide acceptance the new system still needed a boost and in the same way that star wars in 1977 convinced cinemas to upgrade their sound systems, Avatar would be a game changer for visuals.

With digital technology like DVD beginning to dominate film making it is doing wonder for film makers and audiences alike. The most obvious change to film making as a result of digitization is the shift to a digital film stock, and the positives are numerous, faster processing times, first grade image quality regardless of age and easy manipulation make the switch to digital video inevitable. The biggest drawback of the digital format and possible the only factor holding it back from becoming the film stock of choice, is the issue of exhibition. At the start of 2001 only 30 screens were equipped to show a digital image so the job of transferring the digital movies to film is still necessary to exhibit the pictures worldwide.

Interactivity is another concept brought to forefront as a result of digitization. One of the areas that most excited film makers when digital technology burst onto the mainstream scene was the notion of “interactive narrative..... Something which will let cinema tell its stories in a new way <sup>2</sup>.

## NEGATIVE IMPACT

### ALIENATION FROM NATURE

From a certain point of view, digital technology is merely the next logical step in a long process that has seen mankind lose touch with the natural world. Critics fear that this alienation has been both the cause of unhealthy mental habits and neurosis in individuals, as well as the cause of environmentally destructive habits in society at large.

### LOSS OF ORIGINALITY

Works of art were now being mass produced by machines and originality was less important. Digital technology has taken this process even farther making the reproduction of digital artwork unlimited.

### ANARCHY

Digital technology has proven to be a very destabilizing force where it has been introduced. Older hierarchies in business and politics have already been disrupted by computers and internet. As world becomes more digital, it will also become more lawless and out of control. Breakdown of copyright law is an example.

### DIGITAL DIVIDE

It increases the differences already existing between the rich and the poor. Bringing access to digital technology for the world's poor is a developing problem in the new modern world.

## POSITIVE IMPACT

### HISTORY

The second half of the 20<sup>th</sup> century marked the advent of digital technology in film making. “Star Wars” was the first of its kind to use computer generated special effects. Disney’s “Tron” in 1982 was the first movie to use high resolution imagery. Seven years later, director James Cameron used computer generated imagery (CGI) in his live action film “The Abyss”. Ten years later, every scene in George Lucas “The Phantom Menace” included CGI.

### IMAGE AND SOUND QUALITY

Digital cameras increase image resolution which created higher quality pictures. Footage filmed with a digital camera is also easier to edit. Unlike analog film, it does not lose any signals during the editing process. Digitally recorded sound also has a higher quality than analog-recorded audio. The resolution is higher, and the sound quality does not deteriorate.

### SPECIAL EFFECTS

In the early days of film making special effects were achieved through camera tricks. Those effects looked amateurish, and sometimes proved to be more humorous than convincing. Digital technology can create dazzling special effects that appear realistic and natural and engineers use computers to insert them into the films.

### IMPACT ON PLOT

The advances in special effects have impacted how movies are made. However, some people argue that as special effects get better, movie plots become worse. Critics claim that directors exploit digital technology so much that they ignore a weak plot. The result is a technically spectacular movie with an insubstantial story<sup>3</sup>.

### THE DEMOCRATIZATION OF FILM MAKING

Digital technology has made the art of film making more accessible. Decent quality digital camcorders are available to anyone, and editing programs can be accessed on a home computer. Websites such as You Tube provide global exposure for budding film makers. Films that would not have been before digital technology can now be seen all over the world.

A handful of Hollywood soothsayers were predicting the imminent arrival of digital cinema in the middle of the 20<sup>th</sup> century. In 1949, the independent producer Samuel Goldwyn, who had helped to launch three Hollywood studios (Paramount, MGM, and United Artists), anticipated the development of video-on-demand systems that would allow movie fans to view the movies they wanted to see at home, as well as methods for delivering a movie electronically to thousands of theatres, saving the studios the cost of making film prints.

A few years later, in 1954, Albert Abramson, a CBS TV engineer, published an article titled, "A Motion Picture Studio of 1968". In it, he sketched out how digital cinematography and a film free distribution system would work: movies would be shot with electronic cameras, and then sent by radio – relay or coaxial cable to the theatres. Five or fifty theatres in an area may be receiving the same program. Abramson also respected that by 1968, a new generation of electronic cameras would be totally self- contained and cordless- capable of capturing 3-D imagery and transmitting it wirelessly back to the production centre.

In 1955, Abramson followed up with a book, *Electronic Motion Pictures*, which began with the declaration, "The cinema has entered the electronic age..... Motion picture production is changing from a mechanical process to an electrical one...."

Even on the verge of the 21<sup>st</sup> century, film makers, cinematographers, studios, theatre owners and the movie industry's equipment suppliers remained stubbornly attached to celluloid and the companies that sought to make the cinema a digital medium encountered countless cold shoulders. Upgrading an industry with such a vast web of interdependent players, each with its own financial motivations and a long list of justifications for preserving the status quo, is rarely an easy task.

In the 1990s the telecommunications company then known as Pacific Bell created an initiative called "Cinema of the Future", to promote the use of its fiber-optic lines for movie distribution. PacBell successfully sent the movie *Bugsy* from the Sony Pictures lot to a trade show at the Anaheim Convention Centre in 1992.

Two complete outsiders, Stefan Avalos and Lance Wailer was to make *The Last Broadcast*, the pair use of visual effects software from Adobe, and a semi- professional digital video camera from Sony, the DCR-VX1 used an \$80 toy video camera

made by Tyco. Before they had finished production both of them were invited to Belgium to speak about digital movie – it was there that they first saw a high – resolution digital projector, made by BARCO, a Belgian company.

The decade that followed the debut of *The Last Broadcast* saw major investments in digital cinema by Electronics, Christie Digital, Disney, Technicolor, Warner Bros, Kodak, Boeing, and Access Integrated Techno Paul Breedlove at Texas Instruments and Phil Barlow at Disney made tremendous contributions, tirelessly distribution and projection <sup>4</sup>.

### SENSOR

Digital cinematography cameras capture images using CMOS (complementary metal oxide semiconductor) or CCD (charge coupled device) sensors, usually in one of two arrangements.

Single chip cameras designed specifically for the digital cinematography market often use a single sensor with dim. Similar in size to a 16 or 35mm film frame or even a 65mm film frame.

An image can be projected onto a single large sensor exactly the same way it can be projected onto a film frame, so cameras with this design can be made with PL, PV and similar mounts in order to use the wide range of existing high end cinematography lenses available. Their large sensors also let these cameras achieve the same shallow depth of field as 35mm or 65mm motion picture film camera <sup>5</sup>.

### Conclusion

Now that millions of cameras are in the hands of amateurs and professionals alike, there is a revolution in movie making and exhibition. All the rules of cinema are out the window, as these cameras now produce enough resolution that even theatrical projection is possible. However, the theatres only have room for studio pictures made with major stars, movies that are well over \$50 million in budget.

DVD releasing and internet streaming are now the most frequent mode of exhibition for the great majority of professional movies. The amateurs exhibit their extravaganzas on YouTube, My Space and their clones. Film making is preserved by a few film makers around the world. Ironically, film making has been invigorated by the Digital Revolution. Even though indie producers make movies with digital cameras, film is still king.

All the professional digital cameras have features to produce the “film look”. There are lens attachments and myriads of plug-ins. Digital movie makers buy thousands of dollars worth of plug-ins for their expensive cameras and moreover spend thousands more on editing suites and computers. It is not unusual for a digital producer to spend \$100,000 or even \$200,000 on digital gear to simulate the “look of film”. So a vacuum was opened up and suddenly there were DIT’s. If a DIT could talk with enough confidence, they could talk their way into almost any shoot because producers, line producers, nobody had a cooking clue what any of the jargon meant, how these cameras worked or what to do with the data.

Camera assistants, loaders, and stunned in horror and disbelief that such a thing was possible now had to catch up with the technology or risk being made redundant which was very real. Many young movie makers are oblivious to the fact that a film maker can shoot an entire 35mm feature film for \$50,000 – including camera, sound, film stock, developing, editing, negative cutting and printing. But the hysteria to go digital is so great that producers go stark raving mad and buy the latest digital cameras that are literally obsolete by the time they read the user manuals. They want to shoot digital movies.

The first is the DIT, the Digital Imaging Technician. When Red Digital Cinema started shipping the Red One, suddenly there became a huge market demand for digital imaging technicians. A new technology had created a new job description overnight at the level of a traditional experienced camera assistant and it was open to anyone with IT skills willing to take on the acronym regardless of experience <sup>6</sup>.

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