

Technologies in the History of the Movie Industry

Zhouye Huang(Jerry Huang)

Abstract:

The paper titled “Technologies in the History of the Movie Industry” examines the evolution of film technologies and their profound impact on the industry. It explores key technological advancements, from early silent films to talkies, black-and-white to colored films, and the rise of CGI and 3D technology. Each advancement not only enhanced the visual and emotional experience for audiences but also helped filmmakers convey complex ideas and create immersive worlds. The success of iconic films like *Avatar*, *Metropolis*, and *Jurassic Park* demonstrates how innovations in special effects, sound, and imagery have shaped the industry’s growth. The paper emphasizes that these technologies not only improved film quality but also allowed for deeper connections between audiences and the stories being told, ultimately expanding the possibilities of cinematic expression. Through historical analysis, the paper reveals how each technological milestone contributed to the artistic, cultural, and economic success of the film industry.

Keywords: movie industry, technological milestone, films

Introduction

In the history of film, numerous remarkable creations of technology have broadened people’s horizons over and over again. Back in 2009, the appearance of *Avatar* marked as the first and only movie that was made in 3D. With the blessing of this technology, the beautiful and imaginative world of Pandora along with ferocious animals, evil humans and aggressive local residents had been successfully presented on the screen in a more realistic way and at the same time led to a great progress in terms of watching experience for the audiences. Furthermore, the special effects shown in the movie also represented the highest level of the world back then. With the use of strong CGI technique, the director’s fantasy world and creatures along with an interesting story had absolutely blew people’s mind. Specifically, when this movie first came out, many people rushed to buy tickets just to be among the first to see it and even the price of the tickets had gone up to an abnormal range, which some families couldn’t afford that much on a three hours movie. As time went on, this insane phenomenon helped *Avatar* to eventually top the global box office with 2.923 billion dollars. Thus, the success of *Avatar* not only showed what improvements in technology could bring to the whole industry but also created a new path for subsequent films.

Technology review

Imagine what the world would be like without movies. Starting from 2000 to 2018, the line graph of the number of films released in the US and Canada showed a trend of stable increase. It began with the 371 movies released

in 2000 and ended with the 873 movies released in 2018. (Statista) This huge improvement in movie production proved the fact that film industry has impacted people’s daily lives as it serves as one of the most important forms of entertainment in the modern world. Nowadays, movies provide a wide range of genres for people to choose. However, have movies always been like this? In fact, movies in the late 19th century only consisted of very basic storylines along with colorless imagery and soundless backgrounds. The poor technology limited the choice of themes and also imprisoned people’s ideas. Start from the early 20th century, the appearance of talkies had brought more emotional values along with richer story lines to the films. Moving on to the mid 20th century, some early stages of special effects helped directors to successfully incorporate their ideas and predictions about the future society into the movies. The invention of more advanced technologies in the late 20th century, such as CGI, industrial lightning, special shooting cameras and so on improved the overall quality of the film which attracted more audiences to this industry. CGI stood out in all these innovative technologies and served as one of the biggest contributions to the industry. It supported many actors to complete dangerous actions during the shooting process and contributed to the construction of those imaginative worlds. Nowadays, movies provide a wide range of genres for people to choose. The film industry gained popularity and success through the gradually improving technologies, which also contributed to the exploration of new genres, establishment of mature movie structures and helped to make connections to society.

The transition from silent films to talkies marked as an important turning point in the history of film in terms of bringing a remarkable increase in popularity of movies and building a connection between the audiences and characters. The silent films back in the early 20th century mainly focused on simple story lines and could only use exaggerated movements along with facial expressions of the characters to express emotion. On October 6, 1927, the first talkie called *The Jazz Singer* appeared. This marked as one of the most important turning points in the history of movies since the innovative inclusion of cheerful music in this film has brought the audience more emotional values than the previous silent films, which led to a huge economic boost for the industry: "Guesses at the weekly attendance are unreliable, but when one writer says that 57,000,000 went to movie theatres in 1927 and 110,000,000 in 1930, the proportion of the increase is probably correct" (Kenneth, 289). The significant increase in audience not only proves the success of the talkies but also expresses the idea that technology could definitely improve this industry in various ways. Furthermore, compared to the stereotypes of characters shown in the silent film, talkies would be able to present more diverse characters. According to the study of Kenneth, he states that "Through spoken dialogue, on the other hand, a film could present well-rounded characters. Its men and women could have the breadth and depth of true humanity" (Kenneth, 297). Having a deeper understanding towards different characters in the movie served an especially important purpose for the audience because they would feel more connected to the story and have a better watching experience. Moreover, while people may have different interpretations toward plots of the silent movies, which would cause confusion, talkies helped the audience to not rack their brain too much to figure out what the movie wanted to convey and allowed them to focus on the enjoying process more. Consequently, the transition from silent films to the talkies had definitely benefited the film industry in various ways.

Due to the appearance of some early stage special effects, sci-fi movies in the early 20th century successfully presented future concepts such as social predictions based on the historical events in the movies. The invention of rear projection, which allowed the actors to interact with the moving background created by the projector served as a popular special effect that most directors would use back in the 1910s. The Schufftan process, which could change the ratio of actors to the background represented another famous innovation back in the early 20th century. The famous director Fritz Lang first chose to use this brand new technique in his movie *Metropolis* in order to highlight the insignificance of human beings in those gigantic futuristic

cities. That is to say, according to the author John Sanders, "Metropolis[1927] stands aloft, gazing imperiously at all the science fiction films to come, cerebral and visual, and coming from an era when films themselves were almost the studd of science fiction themselves" (Sanders, 139). Due to the appearance of the Schufftan process, which had an enormous contribution to the filmmaking process, Fritz Lang successfully depict his ideal thoughts toward mega cities along with skyscrapers in *Metropolis*. Also, thanks to this technique, early people's expectations for future cities could be presented on the screen and left it for the people to study from. Future generations even described this movie as one of the most avant-garde movies in the history of the industry. With that being said, this movie would not be able to gain this amount of popularity without its predictions for the futuristic societies. As John Sanders mentioned in his book, "The future, as is often the case in this genre's films, is full of uncertainty, tyranny, and horror, and is characterised by the dehumanisation of those in the community" (Sanders, 143). In *Metropolis*, the corruption and tyranny of the upper class contradicted with the poor life of the lower class could be interpreted as a successful prediction of societies nowadays in certain countries where the obvious gap occurred between rich and poor people. That is to say, instead of elucidating the ideas presented in *Metropolis* as predictions, it served more like a warning to people in the future that thus kind of phenomenon could impact the world negatively.

The transition from black and white to colored films has brought the filmmaking process to a higher level, leading to the discovery of the new genres that led to a significant promotion of the industry. Due to the invention of the first color motion picture process called kinemacolor, some colored short videos had been successfully brought to the audience. However, the colored film technology back then was not mature enough to incorporate color into a long movie. As time went by, in 1959, the release of *The World, the Flesh and the Devil* marked as the first color movie in the industry. Instead of the vague black and white films which would sometimes confuse the audience, the appearance of color had definitely improved the visual perception of movies. Furthermore, being able to produce color in films also allowed the directors to better express their ideas in terms of showing more complicated stories and emotions, which eventually even led to the discoveries of those new genres. As Ricard and Lampe proposed in their research, "Adventures and musicals were enhanced by color's association with fantasy" (Ricard and Lampe, 989). That is to say, while enriching the visual effects, the invention of color also promoted certain types of genres, such as adventures and musicals, to the public. This promotion caused a shift in audiences' tastes, which

resulted in a change in popular movie genres – from story based movies to more visual based movies. Also, more filmmakers were inspired and decided to put more effort into developing innovative ideas toward stories as well as technological developments in order to persuade business magnates to invest in their movies. In 1939, *The Wizard of Oz* successfully presented an example of how color influenced the content in the movie. As Hellerman mentioned in his study, “The transition from the sepia-toned Kansas scenes to the vibrant, technicolor world of Oz serves as a classic example of using color to signify shifts in narrative and emotion” (Hellerman, 1). With the benefit of technological advancements, audience got the chance to feel the more obvious change of emotions and have a way better watching experience.

Due to the significant growth in special effects and sound production equipments, fiction movies in the 1950s and 1960s shifted the focus to wider concepts such as space and gigantic monsters that warn the society about future catastrophe. The slit scan technique first got promoted by the American filmmaker Stanley Kubrick in his movie *2001: A Space Odyssey*. The distorted images along with various colors shown in the movie aroused people’s discussion of unknown things in space. According to John Sanders’s research, “But this sense of harmony is shortlived as space becomes more and more inhospitable and comes to signify man’s vulnerability and lack of knowledge in the face of infinite possibilities” (Sanders, 168). This movie served as a warning by emphasizing the fact that lacked in knowledge of unknown things such as universe and artificial intelligence may lead to the demise of human society. Additionally, the plot where all the human characters got manipulated by HAL 9000 made a prediction that human may have a chance to lost control over those advanced technologies. However, apart from the precious concepts, *2001: A Space Odyssey* has a deeper layer of meaning that worth more people’s notice and pondering. As Sanders stated, “But it is also a film, which is very much of its time in terms of the counter-culture; one poster tag-line reads ‘The Ultimate Trip’, a reference to the Western World’s growing love affair with ‘recreational’ drugs which had gathered momentum in the 1960s” (Sanders, 168). In this movie, Stanley Kubrick successfully satirized the social phenomenon of drug addiction. He used a large amount of distorted images and bright colors to mimic the addict’s vision in order to warn people about the harm of drugs to their health. Moreover, the born of suitimation marked as another considerable invention towards film industry in the mid 20th century. Compared to simple makeups and custom, the fine production of suitimation could make those monster characters such as Godzilla more realistic. The various incidents

such as the Bay of Pigs, the Vietnam wars and Cold War inspired the famous Japanese director Ishiro Honda to make this benchmark for monster movies, *Godzilla*, to admonish various countries to stop their act of war. The scary godzilla in the movie could be interpret as a metaphor towards nuclear weapon and the depiction of how it destroys cities and armies emphasized the destruction that large weapons could bring to human society.

Special effects in the 1970s like Realistic lightning and heroism had some great contributions in terms of providing positive energy along with hope for people during the economic depressions. George Lucas, ‘The maniac of special effects’, dedicated a huge amount of time to pursue the perfection of special effects in *Star Wars* which the result turned out to be fascinating and shocking. During the period of economic depression and Cold War, the overall vibe of the American society appeared to be negative and unenergetic: “The 1970s were characterized by both world economic depressions and greater individual freedom in parts of the Western world” (Sanders, 174). However, the amusing story about Luke Skywalker’s heroism that led to the victory of the Jedi helped to express the idea of being optimistic and hopeful. Combining this with the unprecedented exquisite special effects, *Star Wars* successfully captured the audiences’ attention. In the movie, the dark side established a connection with the Soviet Union in the Cold War and introduced the concept of how democracies get turned into dictatorships. The Death Star, which symbolized nuclear weapons, supported the anti-war movement by showing people how dangerous and devastating the weapons could be. Moreover, by creating a whole new worldview that included imaginative buildings, species, soldiers, and space ships, George Lucas had accomplished something more than just putting in an interesting story and combining it with excellent special effects: “A second explanation is that *Star Wars* owes much of its popularity to a richness of audiovisual invention that is rare in science fiction or any other genres” (Lev, 30). The star ships and planet models manipulated by computers also made Lucas’s valuable and irreplaceable imagination possible towards the world of *Star Wars*.

The rapidly strengthening visual technique in 1980s such as go motion and CG created the opportunity for directors to shift their focus to the emotional values provided by the fictional plots. To start off, the go motion technique served as a variation of the stop motion animation. Specifically, the wonderful vibe created by the special motion blur image from go motion really attracted some directors, such as Steven Spielberg. Due to the invention of this unique technique, Steven Spielberg successfully accomplished the iconic part in *ET The Extra-Terrestrial* where ET and Elliot rode on a bike together and flew over the full moon.

In addition, since the huge improvement of technology in 1980s helped to lower the production costs, Spielberg transformed his focus from investigating how to achieve better applications of special effects to examining ways to provide more emotional values along with exquisite story line to the audiences in his movies. John Sanders described the appearance of *ET The Extra-Terrestrial* as “If the 1980s were about financial gain and individuality in Western culture, then *ET* was an antidote to the value system; it expressed ideas of companionship, helping others, selflessness, compassion and a condemnation of the brutal and unfeeling powers of the Establishment” (Sanders, 181). Such an innovative science fiction movie with emotional values as the theme had attracted people from different age group. When adults got trapped in the fatigue and troubles from work, this kind of movie served like sweet chocolate, or a soft pillow that brings them comfort. Moreover, the positive and correct core values presented by this movie played a role in educating children, which at the same time also helped this movie to become suitable for all age groups. This movie also marked as a good start for the CG era because it contained some early stage CG effects in the scenes where there would be frequent movements of ET. But due to the funding restrictions and technological issues, only a handful of scenes contained this technique.

The rapid development of the CGI technology successfully enhance the realism of special effects and allowed directors to bring in their imaginative worlds, creatures and so on. CGI stands for computer generated image and it helped to create two or three dimensional graphics in movies, video games and so on. In Sanders’s book, he stated the fact that “The cutting edge, computer generated images [CGI] were part of a larger picture of technological breakthroughs in all areas of new media” (Sanders, 189). That is to say, this technique had a remarkable impact on many famous movies in the late 20th century. Moreover, Steven Spielberg’s series, *Jurassic Park*, represented a great example when it comes to CGI production in movies. To be specific, directors would normally choose to use suitimation which required a relatively large amount of time for the actors to put on those heavy clothes and start acting out the big moving creatures, like dinosaurs, before the appearance of CGI. However, with the help of CGI, those dinosaurs could be much more realistic and make the production process much easier: “The 1993 Steven Spielberg film, *Jurassic Park*, really moved film realisation of complex visions onto a new level of possibility with its digital creation of dinosaurs” (Sanders, 189). The ability of CGI had shocked almost everyone back then and soonly became one of the most popular special effects that film companies with enough budget would use. Another good

example of CGI in movies was the *Matrix* series. The ambitious Wachowski family used this technique along with their imaginations to complete an unprecedented effect in the movie – the bullet time. The aesthetics were presented to the extreme in the movie when the time seems to have suddenly slowed down after the bullet got fired out. Along with the actor’s exaggerated movements, this scene became noted in the history of the whole industry. To add on, by using the CGI technique, *The Matrix* also tried to warn people about the danger of internet: “The 1990s saw an explosion in new media technologies, which were to have an immense impact on society” (Sanders, 191). The concept of “new world” shown in the movie used depiction about society’s corruption and people’s addiction to the internet served as a prediction towards how internet and technologies will negatively affect people’s lives.

The appearance of computer animation cooperated with hand drawn techniques helped to develop more abstract story lines and unconstrained scenes. Apart from CGI, the development of celluloid technology also played a big role in early stage films and animations, which one of the most famous animation in Japanese history, *Akira*, was made by this technique. This traditional technique helped to add some retro colors to the movie which provided an energetic vibe. In addition, the animation filmmaking techniques can benefit science fiction genre films by creating scenes that would be impossible to produce in real world. As Sylvia Woodbury proposed in her essay, “Animation’s capabilities extend beyond the reproduction of live action. An animated feature plays with shape, line, color and perspective, infusing a film with a dual story: that of the world and characters, and that of the art which represents them” (Woodbury, 2). Compare to the special effects, animation could better support the crazy and abstract thoughts from the directors with lines and colors. For example, in *Spirited away*, the director Hayao Mizayaki used various weird shaped ghosts to create contradiction with the main character’s clean appearance and innocent nature. In the story part Hayao Mizayaki concentrated on the main character Chihiro’s journey to find his parents who got lost in an imaginary world. The process suggested the child’s transition to adulthood and the movie ended with a beautiful family reunion. Thus, healing people’s hearts during the post war period served as another purpose of the appearance of the animation. According to Kincaid about animation, “In many ways these “healing” stories offer the most realism, even the fantasy-based ones. Most conflicts center on small, everyday things. The characters live small, everyday lives, yet there’s a joy, a dignity, to such everyday lives” (Kincaid). Most animation movies or shows focused on using warm stories and cute characters to emphasize happy lives, which created contrast with the

dangers of the war in order to convey the importance of peace to people.

From the perspective of modern times, 3D technique definitely had an extraordinary contribution in terms of improve the visual effects of movies. However, due to the lack of technology, the early stage of 3D provided people with really bad experiences. According to Lipton, "... an illusion that fluctuates greatly and is crudely and artless used - there is little or no stimulation of a pictorial or dramatic sort to be had... a clumsy try at an African adventure film ...,eager and hackneyed... slap-dash... very poor color..." (Lipton, 611). As the source expressed, instead of watching the innovative 3D movies, people prefer the movies with normal visual effects more. This connected to the idea that having a new technology could be considered really important, but this technique should be mature enough already to adapt to human aesthetics. As time went by, the enormous improvements in 3D technology had impressed the public. 2009 served as a huge year for the 3D era because the appearance of *Avatar* had brought 3D into those mainstream visual effects in movies. Seeing the success of *Avatar*, various movie companies started to incorporating 3D technology to their movies in order to enhance the visual quality and better present the characteristics the directors' imaginative world to the audience. *Life of Pi*, a movie produced in 2012, could be considered as one of the greatest 3D effect movies in the 2010s. It used the Geomagic Design X 3D scanning software, which represented the highest level of 3D technology and collaborated with the amazing special effects in the movie. The positive comments from the audience about this magical journey of a man and a tiger proved the success not only the story but also the advanced technology in this movie.

Conclusion

To conclude, the watching experience of movies got better and better because of the continuously developing technology in the industry. From silent films to talkies, black and white films to color films, 2D to 3D, new genres and so on; all these remarkable moments in the history of movie not only represented the improvements in tech-

niques but also highlighted human's endless imagination.

References

- Bordwell, David, and Kristin Thompson. *Film Art: An Introduction*. E-book ed., McGraw hill, 2001. Google Books.
- Case, Dominic. *Film Technology in Post Production*. Second ed., e-book ed., Taylor & Francis, 2001. Google Books.
- Powers, John. *Technology and the Making of Experimental Film Culture*. E-book ed., Oxford University Press, 2023. Google Books.
- Sanders, John. "Science Fiction." *The Film Genre Book*, Liverpool University Press, 2009, p. 139. *filmsite*. www.filmsite.org/90sintro.html.
- Lev, Peter. "Whose Future? 'Star Wars, Alien', and 'Blade Runner.'" *Jstor*, ITHAKA, 1998, www.jstor.org/stable/43796821?read-now=1&seq=2#page_scan_tab_contents.
- Gil, Ricard, and Ryan Lampe. "The Adoption of New Technologies: Understanding Hollywood's (Slow and Uneven) Conversion to Color." *Jstor*, www.jstor.org/stable/24550691?read-now=1&seq=1#page_scan_tab_contents.
- Groot, Kylie N. "From Silence To Sound: Causes And Effects Of The Talkies." *Firescholars*, firescholars.seu.edu/cgi/viewcontent.cgi?article=1117&context=honors.
- Jstor*. www.jstor.org/stable/1577230?read-now=1&seq=1#page_scan_tab_contents.
- MacGowan, Kenneth. "When the Talkies Came to Hollywood." *Jstor*, www.jstor.org/stable/1209987?read-now=1&seq=2#page_scan_tab_contents.
- New York Times*. www.nytimes.com/2023/06/28/learning/the-unlimited-possibilities-of-animation.html?searchResultPosition=2.
- New York Times*. www.nytimes.com/2001/11/11/movies/film-from-afar-2001-looks-like-1968.html?searchResultPosition=2.