Abstract

Since the end of the 20th century, animation techniques have been widely used in productions, advertisements, movies, commercials, credits, visual effects, and so on, and have become an indispensable part of the cinema and television. The fast growth of technology and its impact on all production industry has enabled computer-generated animation techniques to become varied and widespread. Computer animation techniques not only saves labour and money, but it also gives the producer the option of applying the technique in either two dimensional (2D) or three dimensional (3D), depending on the given time frame, scenario and content. In the 21st century cinema and television industry, computer animations have become more important than ever. Imaginary characters or objects, as well as people, events and places that are either difficult or costly, or even impossible to shoot, can now be produced and animated through computer modelling techniques. Nowadays, several sectors are benefiting from these specialised techniques. Increased demand and application areas have put the questions of aesthetics and design into perspective, hence introducing a new point of view to the application process. Coming out of necessity, 3D computer animations have added a new dimension to the field of art and design, and they have brought in the question of artistic and aesthetic value in such designs.

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1. Introduction

Centuries ago, ancient people not only expressed themselves by painting still images on cave surfaces, but they also attempted to convey motion regarding moments and events by painting images, which later helped establish the natural course of events in history. Such concern contributed greatly to the animation and cinema history.

First examples of animation, which dates back approximately four centuries ago, represents milestones in history of cinema. Eadweard J. Muybridge took several photographs with multiple cameras (Figure 1) and assembled the individual images into a motion picture and invented the movie projector called Zoopraxiscope and with the projection he held in 1887 he was also regarded as the inventor of an early movie projector. In that aspect, Frenchmen Louis and Auguste Lumière brothers are often credited as inventing the first motion picture and the creator of cinematography (1895).

J. Stuart Blackton clearly recognised that the animated film could be a viable aesthetic and economic vehicle outside the context of orthodox live action cinema. In particular, his movie titled The Haunted Hotel (1907) included...
impressive supernatural sequences, and convinced audiences and financiers alike that the animated film had unlimited potential. (Wells, 1998:14)

“Praxinoscope” - invented by Frenchman Charles-Émile Reynaud - is one of the motion picture related tools which was developed and improved in time, and the invention is considered to be the beginning of the history of animated films, in the modern sense of the word. At the beginning of the 20th century, animated films produced through hand-drawn animation technique proved very popular, and the world history was marked by the most recognisable cartoon characters in the world that were produced through these animations, such as Little Nemo (1911), Gertie the Dinosaur (1914), The Sinking of the Lusitania (1918), Little Red Riding Hood (1922), The Four Musicians of Bremen (1922) Mickey Mouse(1928), Snow White and the Seven Dwarfs (1937).

Nazi regime in Germany leads to several important animation film productions. When Goebbels could no longer import Disney movies, he commissioned all animation studios to develop theatrical cartoons. Upon this, Hans Fischerkoesen began to produce animation films and by end of the war, he produced over a thousand cartoons (Moritz, 2003:320).

In due course, animated films became increasingly popular, resulting in new and sizable sectors, and the advances in technology made expansion possible. From then on, the computer-generated productions, which thrived in the 1980's, snowballed into the indispensable part of the modern day television and cinema.

The American animated movie Aladdin grossed over 495 million dollars worldwide, and represented the success of the American animation industry, which then led to an expansion into animated movies which targeted adults (Aydın, 2010:110).

Japan is possibly just as assertive in the animation films as America. Following the success of the first Japanese animation (anime) called The White Snake Enchantress 1958 (Figure 2)which resulted in awards in Venice, Mexico and Berlin film festivals, Japanese animes became ever so popular, which led to continuous international success. For example, the movie titled Spirited Away won an Oscar for Best Animated Feature Film, and became the winner of the top prize at this year's Berlin film festival. Following their ever-increasing success in anime production, Japan became one of the most sought after hubs of animation industry by European and American companies interested in collaboration.

Today, several top directors, scriptwriters and animation producers are known to be infatuated with Japanese animation films. Hayao Miyazaki, Mamoru Oshii, Katsuhiro Otomo are only a few of the director, writer and animation producers worth a mention. Examples are as follows:
2. Three Dimensional Animation

The development of animation techniques, a process that can be traced back to the 18th century brought with it a thematic variety in animation genres. Today, animation techniques based on cartoons, puppets, stop-motion, shadow, cut-out and time lapse can be applied both manually and based on digital technology. Furthermore the use of 3D computer graphics in the 1976-dated film "Futureworld" opened the way for this technology to be in high demand in a variety of industries. 3D animations occupy a central role today in cinema, TV, education and video games alike, and their creative processes in both realistic and surreal terms seem to know no limits. This new medium that with its magical powers makes the impossible possible and defies the laws of physic (Gökçearslan, 2008: 1) open a door for designers and artists to an unlimited imagination. "In particular in the movies of the 80s, computer-aided animated effects turned out to be life-savers, and the feature film Terminator 2 (1991) in which 3D animation technology was used for the first time received praise from both audience and film critics" (Kaba, 1992: 19). Toy Story (Walt Disney Pictures, 1995), a film that became very popular among audiences of all ages due to its script, characters, settings and animation technique, was the first fully 3D animated feature film in history, and was followed by two sequels.

By help of the support coming from the homeland, and its form oriented realistic format, Disney characters have been amongst the top animated characters. In order to achieve a realistic production, Disney even kept animals such as horses, deer, and rabbits in the studios, while the artists studied their form, movements and behaviour. As for human characters, famous movie stars of the period were hired as a reference point for human form and behaviour. (Gökçearslan, 2009:80).

Another American movie "Shrek" (2001) created by William Steig, whose book Shrek (1990) formed basis for the DreamWorks Pictures full length 3D animation film, attracted millions of people. The movie is a great example of a clever and aesthetically pleasing combination of powerful imagination and realistic design. Also, by means of certain dialogues and jokes, the theme of "value judgement" is simplified in a way that it is also understood by children. These are amongst two undeniable factors which are thought to have contributed to the worldwide success of the movie.

Most successful 3D animation movies are of American make. The importance of budget, historical and political factors, as well as contextual and stylistic factors which bring in simplicity and clarity to the movies is incontrovertible.

"The era of the post-photographic film has arrived, and it is clear that for the animator, the computer is essentially "another pencil". Arguably, this has already reached its zenith in PIXAR's Monsters Inc. Consequently, it remains important to note that while Europe has retained a tradition of auteurist film making, also echoed elsewhere in Russia, China, and Japan, the United States has often immersed its animation within a Special Effects tradition, and as an adjunct to live action cinema." (Wells, 2002:2).

3. Aesthetics and Design in Three Dimensional Animations

Low-budget and high-budget 3D animation movies go through the same process, regardless. This process is necessary in order to put several elements together properly.
The first step is to write up a short text called synopsis, which aims to outline the movie plot, content and theme. Following the approval of the synopsis, the creative team moves on to storyboarding, where illustrations or images are displayed in sequence for the purpose of visualising the movie (Figure 3). Storyboarding process reflects 3D animator’s perspective and the elements that are aimed to be conveyed to the audience. The animation artists give life to a scenario, and add a touch of their personality to the characters and environment. “Gone With The Wind” is the first movie where the storyboarding technique, which was initially used in Walt Disney Studios during the production process of animated movies, was used for a non-animation movie, and since the 1940's, it has been an indispensible part of the film industry (http://storyboart.com).

![Figure 3: Toy Story, storyboarding, Pixar (http://www.youtube.com)](image)

Story board artists are the staple of film industry, and they are the ones who either make or break the design and aesthetics of the movie. While they their main responsibility is to enframe the movie scenes with aesthetics and design quality in mind, they are also responsible for incorporating lights, shadows and colours in a way that it enhances the realistic features of the movie.

The next step following storyboarding, is "timing" which is particularly important in determining the length of scenes, by taking the script into consideration. In order to achieve a realistic and plausible product, meticulous mathematical calculations are required.

The next important step is to create characters and environment in 3D software, and finalise the production in accordance with the story-board. While character and objects are modelled in 3D software, such as 3Ds Max, Cinema 4D , Houdini, Maya, Lightwave, the background design is also created with digital art programs such as Photoshop, Illustrator, Artage, depending on the type or content of the movie (Figure: 4). Three dimensional modelling is the digital version of sculpturing. In time, with ever-changing technology, plastic arts have improved and become varied, leading to a new form of digital art, which also provides aesthetic integrity in terms of technique and content. Same as manually produced art work, 3D creations are also produced by highly skilled artist with extensive knowledge of anatomy, patterns, colours, textures, lights and composition. Such artists and designers are able to make use of their imagination and creativity, and take care of both technical and aesthetic aspects of creating an animated movie.

![Figure 4: Examples of 3D modelling (left) and background (right).](image)
In a movie, the colour, light and shadow elements affect the modelled character, setting and background to a very large extent. Three dimensional computer graphics software provides a realistic virtual studio and endless source of light combinations. Hence, the message and feeling is conveyed through an artistically sensitive and aesthetically pleasing atmosphere, created with a certain combination of light and colours. Spot light, omni, area and direct lights are a few examples to the types of options that can be used on their own or as a combination. For example, in 3D animations the 'direct light' source can be used outdoors as an alternative for the sun, whereas the 'area light' which uses vertical beams can help smooth out the surface by spreading the light around, which makes it ideal for indoors settings. Blue Sky Studio's 3D movie called “Ice Age” (Figure 5) produced in 2001 achieved a kind of unique and impressive technology-driven realistic technique with clever use of lights and colours, becoming one of the first exceedingly successful 3D animations of the period.

![Figure 5: “Ice Age”, Blue Sky Studios, 2001(Weishar, 2004:20)](image)

Following the modelling and finishing touches of other visual elements, each scene is animated one by one. “Actions assigned to each and every visual element within the scene have to have a meaningful connection with the story, in terms of form and content. In fact, the very fundamental principle of computer animations is that each action within the scene serves a certain purpose, and the design within the frame creates visual pleasure” (Şekerolu, 2006:74). Underscoring element is also expected to complement the visuals and be in harmony with the scene. It is an accepted fact that a good visual is presented along with suitable music, affects the audience in emotional and logical sense a lot more than it would have done so otherwise. For that reason, underscores are just as important as other audio elements, such as voiceovers and effects, when it comes to visual complements. Sound is an indispensable part of life and nature, therefore it can be considered as a fundamental means of storytelling. Clever and appropriate use of sound is very effective in maintaining the audience's attention and interest.

In order to produce a meaningful final product in the editing phase, a careful process of storyboarding and timing have to be carried out. Skilfully executed editing can add rhythm and aesthetics to scenes. The integrity of time, setting, audio and atmosphere within a movie is also profusely important in terms of conveying the semantic rhythm. Meticulously timed fade-out, fade-in, radiance or smoke effects would allow the audience to follow the story more attentively and comfortably, and it would also establish consistency in terms of aesthetics of the movie itself.

5. Conclusion

No matter how different the technological circumstances are today, and used to be back in the ancient times when humans painted images on cave surfaces, human beings have always been fascinated with visual communication. Since then, they have been striving to share their experiences, achievements, wishes and dreams with other people, societies or masses. For the same purpose, people have been painting, acting, writing plays, or producing movies. Incessant desire to convey a message through visual communication brought about the invention of the cinema, and since the 18th century, it has become an essential means of presenting ideas, thoughts or feelings to masses. 3D animations, which were mainly used in advertisements, commercials, education and entertainment related productions in the 2000's, brought about many blockbuster 3D movies.
When recorded with a camera, the three dimensional aspect of reality is lost, and turned into two dimensions. In 3D animations, the aim is to emulate the reality and present the audience an experience as close to the real life as possible. "Human eye is much more advanced than a video camera. infinite sense of depth and the ability to focus on several objects at the same time are only a few of many differences between a camera and the human eye. Computer-produced visuals would give the same results as the camera. Same as painting and photography, it aims to interpret the three dimensional world in a two dimensional form." (Şekeroğlu, 2006:62). As a result, 3D animations have become just as important as real applications, and thanks to their ability to produce scenes that are very difficult, even impossible to emulate, they have actually become a better option. Big companies such as Walt Disney, Pixar, and Tree Star have been making 3D animations which appeal to both children and adults worldwide. Successful productions include the elements of appropriate ideas, decent content, combined with expert artists and designers with technical backgrounds. For that reason, in order to establish good quality visual communication and maintain the audience's attention, art and design must go hand in hand. Sometimes, being true to all the fundamental design principles may not be enough to achieve an aesthetically pleasing scene. In order to achieve an aesthetically pleasing scene, warmth and sincerity, which are typical attributes of human beings, must be incorporated into the movie. The modelling team, which functions as the sculptor and creates authentic materials like a painter, teams up with creative story-board artists, and texture and background artists, to achieve an artistically valuable work. In order to achieve plausibility and an aesthetically valuable creation, it is important that colour, light, shadow and textures used during the process are true to real life. Camera angles, speed and direction of movement, the sequence of the scenes and their harmony with the underscoring are essential in determining the schematic and aesthetic quality of a movie.

In conclusion, “Art does not teach. Rather, art presents the full and concrete reality of the end target. What art does is presents things “as they should be or could have been”, which helps people attain such things in real life. However, this is just a secondary benefit of art. The main benefit of art is that it provides people with a taste of what "things would be like if they were the way they were supposed to be" in real life. Such an experience is essential to human life (Beşe, 2006:74). Surely, people cannot watch a movie with the schematic or aesthetic quality of it in mind. However, as the movie progresses, a visual language settles into the spectator's subconsciousness, creating a sense of pleasure. Walter Benjamin claims that a spectator analysing a picture is able to abandon himself to his associations. However, this is not the case for people watching a movie at the cinema. Rather, the cinema audience can only build associations after they have watched the movie, therefore the process of perception is delayed. (Benjamin, 1993:66).

References

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