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YEDİTEPE UNIVERSITY
GRADUATE INSTITUTE OF SOCIAL SCIENCES

EVALUATION OF TECHNOLOGICAL IMPROVEMENTS AT POST-PRODUCTION AREA IN CINEMA SECTOR

by

Ayşegül ALP

Submitted to the Graduate Institute of Social Sciences
In partial fulfillment of the requirements for the degree of
Master of
Visual Communication Design

İSTANBUL, 2012

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LIST OF ABBREVIATIONS

3-D	Three Dimensional
AD	Analog to Digital
CELCO	Constantine Engineering Laboratories Company
CG	Computer Graphics
CMX	CBS and Memorex
DA	Digital to Analog
DAT	Digital Audio Tape
DAW	Digital Audio Workstation
DI	Digital Intermediate
DVD	Digital Versatile Disc
EDL	Edit Decision List
EQ	Equalizer
HD	High Definition
IBM	International Business Machines
IMAX	Image Maximum
MIT	Massachusetts Institute of Technology
Mm	Millimetre
MPAA	Motion Picture Association of America
NASA	National Aeronautics and Space Administration
NTSC	National Television System Committee
OMF	Open Media Framework
PAL	Phase Alternating Line
PDA	Personal Digital Assistant
RCA	Radio Corporation of America
SFX	Sound Effects
TODD-AO	Mike Todd and American Optical Company
TV	Television
US	United States
VFX	Visual Effects

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ABSTRACT

Numbers of the technological developments are increasing inevitably as time passes by. Society's needs create new ideas to be invented and as a result earlier inventions are developed and combined to introduce these new technologies. In other words every new invention is an upgrade of earlier one theoretically. This situation also affects communication technologies and models simultaneously. Level of interactivity occasioned by developed communication systems increases simultaneously based on technological improvements. Today internet has taken the first place over other communication systems yet cinema as a branch of communication systems, maintained its position because it also has became an important product of popular culture.

As a commercial entity, film production can be divided into processes as pre-production, production and post-production. Technological İmprovements resulted changes to take place on all these processes of movie production but most effective changes took place at post-production processes since computer technology turned out to be a strong character on editing process.

This thesis researches the nature of interaction between technology and its development, evaluates technological improvements at post-production area in a historical approach with examples.

At the final part of this thesis, negative and positive effects of technology at post-production area in cinema sector are analysed according to the answers of professionals to the questions based on this research. Only users, who have at least once used traditional systems, accept that they can be useful in some cases. Generally, contemporary systems are preffered and it can be said technological improvements are advantageous for post-production sector.

Keywords: Technology, Communication, Interaction, Cinema, Post-production.

ÖZET

Teknolojik gelişmelerin sayısı zaman geçtikçe kaçınılmaz bir şekilde artmaktadır. Toplumun ihtiyaçları icat edilecek yeni fikirler yaratmaktadır ve sonuç olarak önceki icatlar geliştirilip birleştirilerek bu yeni teknolojileri ortaya çıkarmaktadır. Diğer bir deyişle, her yeni icat teorik olarak öncekinin yükseltilmiş halidir. Bu durum aynı zamanda iletişim teknolojilerini ve modellerini de etkilemektedir. Teknolojik gelişmelere bağlı olarak gelişmiş iletişim sistemlerinin sebep olduğu etkileşim seviyesi eş zamanlı olarak yükselmektedir. Günümüzde internet diğer iletişim sistemlerine kıyasla birinci sırayı almıştır. Diğer yandan, sinema iletişim sistemlerinin bir dalı olmasının yanında popüler kültürün de önemli bir ürünü haline gelerek neredeyse pozisyonunu korumuştur.

Film yapımı, iş kapsamında bakıldığında prodüksiyon öncesi, prodüksiyon ve post-prodüksiyon aşamaları olarak bölümlendirilebilir. Teknolojinin gelişmesi sinemanın bütün aşamalarında değişikliklere sebep olmuştur fakat en etkili değişimler, bilgisayar teknolojilerinin de önemli bir karakter haline gelmesiyle birlikte post-prodüksiyon aşamasında meydana gelmiştir.

Bu tez teknoloji ve gelişimi arasındaki etkileşimin doğasını analiz etmekte ve post-prodüksiyon alanındaki teknolojik gelişmeleri sinemadan örneklerle birlikte tarihsel bir yaklaşımla değerlendirmektedir.

Bu tezin son bölümünde araştırmalara dayanarak hazırlanan soruların sektördeki profesyonellere yöneltilmesiyle elde edilen cevaplar analiz edilmektedir. Sadece en az bir kez geleneksel sistemleri kullanmış olan kişiler bazı durumlarda faydalı olabileceklerini kabul etmektedir. Genel olarak modern sistemler tercih edilmektedir ve teknolojik gelişmelerin post-prodüksiyon sektörüne avantaj sağladığı söylenebilir.

Anahtar Kelimeler: Teknoloji, İletişim, Etkileşim, Sinema, Post-prodüksiyon.

1. INTRODUCTION

Technology is one of the broadly discussed subjects of all times. Many researchers thought it was meaningless to find a definition to this notion. On the other hand argument of the case of technology is a never ending process. Innovators are inventing new technologies because society needs them. In simple terms, today society is living in the middle of this notion. From the food we eat to the music we listen, every single need of life depends on technology.

Cinema is one of the branches which are shaped according to technological developments. A film is produced in three basic steps namely as pre-production, production and post-production. Besides the production phase of a film, in today's environment post-production technologies are also taking attention related to high technology equipments and editing systems with the usage of computer systems within the process. On the other hand, from the last years of 19^{th} century to today, cinema is a mode of communication which never lost interest because it also became an important element of popular culture.

My plan is to evaluate effects of these technological developments on post-production phase of cinema sector. This thesis is constructed on three main parts. Within the second part of my thesis, the existing researches and understandings related to improvement of technology and naturally communication systems are going to be evaluated in order to indicate the main approach of this thesis.

In the present case, communication technologies also became more of an issue. Beginning with the invention of telephone, today internet is the most common mode of communication. Now interactivity is the in the middle of whole communication systems. The main idea of this thesis is to evaluate these upgrades and to carry forward researching, concepts of interactivity and new media have to be mentioned. In this thesis main aim is to evaluate technological improvements at post-production area in cinema sector and electronic media age and interactivity are significant characteristics of this era.

A new film's release date is pronounced on TV, web, magazines, radio, etc. One of the most important improvements in communication technologies was the development of personal computers which provided society to be in more interaction with technology, this was followed with invention of mouse and today touchscreen technologies are available for personal use. Accordingly, computer usage in post-production sector was the most important advance at this sector.

In the third part, in parallel with these understandings, the formation of technological improvements at post-production area in cinema sector is going to be mentioned by the help of examples from cinema in related historical steps.

Fourth part contains the evaluation of interviews on specific questions asked to a group of professionals of post-production area.

The methods used for this thesis contains literature search and documental internet search on technology, technological improvements and theories, communication methods and theories, post-production history and current procedures. Analyse is completed by evaluating the interviews on same group of individuals which work on post-production area.

2. REVIEWING TECHNOLOGICAL ADVANCEMENTS ACCORDING TO PHILOSOPHY of TECHNOLOGY and COMMUNICATION

Without technology, a lot of important achievements could not have been reached; such as travelling outer space, communicating across continents simultaneously, etc. What is more we could not have been able to carry out most of our daily works and habits if our society did not have the advantages that technology provides.

> "Today, computer-based technology is rapidly affecting all of society. Word processing is the expected way to write. An email address is often the only contact information you ask for. Carrying a cell phone is more important than a watch or wallet for many people around the world." (Bricklin, 2009: 2)

On the other hand there are side effects of these benefits actually. Several understandings about philosophy of technology is going to be expressed within this thesis however it is enough for now to mention that technology is an addiction for society and every addiction is someway harmful for their users. Being an addiction is already a solitary damage for human being.

When we use the word technology today, we most often refer to high technology such as computers, cell phones, etc. Among other things, when an anthropologist uses the word technology, he or she shall be mentioning of conscious usage of fire or the invention of wheel. The first known technological periods are entitled as Stone Age, Bronze Age and Iron Age depending on tools and materials which have been used. These ages are the starting point of technological improvements and today technology is continuing to be developed. In order shed light on the formation of technological improvements, understandings related to technology should be reviewed. Within this part definitions and understandings related to technology are going to be clarified.

2.1. Technology as an Improving Notion

Technology is a broad term that refers both to artefacts created by humans, such as machines, and the methods used to create those artefacts as is seen.

> "Application of knowledge to the practical aims of human life or to changing and manipulating the human environment. Technology includes the use of materials, tools, techniques, and sources of power to make life easier or more pleasant and work more productive. Whereas science is concerned with how and why things happen, technology focuses on making things happen. Technology began to influence human endeavour as soon as people began using tools. It accelerated with

> the Industrial Revolution and the substitution of machines for animal and human labour. Accelerated technological development has also had costs, in terms of air and water pollution and other undesirable environmental effects" (Encyclopedia Britannica, 2011).

There are several definitions of technology that belong to well known scientists and philosophers. Some of these thoughts are giving the idea that, it's meaningless to create a definition for technology.

> "However, since its nature and meaning has shifted over time, technology should not be defined as only one term. In etymology, technology refers to a body of knowledge about useful arts" (Misa, Brey, & Feenberg, 2003:7).

The Greek root of the term technology, techné, means belonging to the arts, crafts or skill, and is also related to tactics (Rooney, 1996). Therefore, to the ancients, technology was more than gadgets, it was also to do with skills, know-how, and the art of doing things; it was knowledge, actions and gadgets. A Harvard professor, Jacob Bigelow, used this word mostly in sense with useful arts or accumulated knowledge as he described such useful arts as writing, printing, painting, sculpture, modelling, and casting as well as materials, machines, and processes (Misa, Brey, & Feenberg, 2003). Weber used the German word technik to describe technology, machines and tools, and technique (Weber, 1921). He saw technology as including both physical products and ideas or intellectual devices. Ellul, who used the French word technique in the same way as Weber used technic, puts this view of technology as:

> "The machine represents only a small part of technique…we could say not only that the machine is the result of a certain technique, but also that its social value and economic applications are made possible by other technical advances" (Ellul, 1964:4).

Langdon Winner (1978) gave a historically grounded definition could only reveal technology as something that moved from being something relatively precise, limited and unimportant to something vague, expensive and highly significant. It is "unnecessary to devote much effort to working out precise definitions" (Bijker, Hughes, & Pinch, 1987:3). Thomas Hughes (1991) became more specific in arguing that a general definition of technology would only serve to obscure necessary complexity, thus limiting the contextual panorama in which technology is situated.

Most of these explanations are intended to define technology in an etymological level. The interactive network of man's activities links the strangest, most disparate elements,

bringing together the most unlikely combinations in unexpected ways to create a new world (Burke, Bergman & Asimov, 1985). Within this part, I am going to mention about the understandings and researches related to formation of this rapid growth of technology by a majority. First of all theories related to technology and afterwards communication theories and models are going to be subject to reach cinema as a mass communication mode. For any attempt to show how technology and culture are interwined in a complex and subtle way the expression of theories related to technology understandings should be examined first.

2.2. Historical Approach to Philosophy of Technology

The approach to this subject will be from two perspectives, first of all historically and then contemporary options in the field, the various different theories that are currently under discussion will be browsed. The initial point for this subject will be with philosophy of science as this is one of the most prestigious fields of philosophy. Philosophy of science is concerned with the truth, the validity of theories and experimentation. Science and technology share the same kind of rational thinking based on empirical observation and knowledge of natural causality, the difference with technology is being concerned with usefulness. Science looks for knowledge on the other hand technology seeks control. For Heidegger (1977) science historically precedes modern technology whereas for Bunge (1979) is qualitatively different from pre-scientific technologies.

The thinking way of humanity in traditional societies is formed mostly by traditions and myths. Traditions and myths are notions that cannot be expressed rationally. For this reason it can be claimed that traditional societies prevent questioning these notions in order to protect their belief system. Everything conceivable and every conceivable thing in life, death, and the afterlife had been predestined by a greater power and an unseen entity (Rappa, 2002). On the other hand modern societies are shaped on questioning these specific traditional forms. Unexplained events in nature are explained by several competing and competent physical and emotive theories that quantify and diagnose civilization. The Divine Masternarrative was displaced and replaced by the Scientific Masternarrative. Truth was to be found in knowledge about science and technology, communications' revolutions, systemic, and informational analyses. The modern epoch

displaced God and replaced him with Man (Rappa, 2002). In 18th century European Enlightenment claimed that all customs and institutions arrange themselves useful for humanity. There on science and technology became the new basis for belief. They reshape the culture gradually to be what we think of as "rational" (Feenberg, 2003). After all, technology becomes ubiquitous in everyday life and technical styles of thought transcend over all others.

One might say that scientific-technical rationality has become a new culture. It has become the new belief system for most of societies, but it is now all-embracing that larger questions can be asked about its value and viability. We can judge it as more or less worthy, more or less ethically justified, more or less fulfilling. Modernity is a powerful term which authorizes and even claims such judgment (Chakrabarty, 2011). In so far as such a society is technological at its basis, the issues raised in this larger questioning concern the field of philosophy of technology. Social organizations need to understand where they belong in technology. Otherwise technical knowledge will not be helpful to society. Philosophy of technology teaches social organizations how to use this technical knowledge consciously.

Philosophy begins by interpreting the world in terms of the fundamental fact that humanity is a labouring sort of animal constantly at work transforming nature. This fundamental fact shapes the basic distinctions that prevail throughout the tradition of Western philosophy (Feenberg, 2003).

2.2.1. Philosophy of Technology at Ancient Greece

For being started with historical perspective, we must go back to ancient Greece as mentioned before. The first of these distinctions which Feenberg indicates is between what the Greeks called physis and poiêsis (Feenberg, 2003). The word physis is translated as nature. Within this distinction physis is the one which creates itself and emerges out from itself. On the other hand poiêsis is the practical activity of making in which human beings engage when they produce something such as products of art and craft (Parry, 2008).

The word technê in ancient Greece come to mean the knowledge related with a poiêsis form (Heidegger, 1977). Medicine is a technê which has an aim like healing patients. For the Greeks technai show the perfect way to do things in a strong and objective sense.

Table 2.1 Ancient Greece Distinctions

Physis	Nature	Existence
Poiêsis	Technê	Essence

Each technê has a purpose and meaning for the production of artefacts which they lead. Artefacts depend on human activity but the knowledge which technai contains has no subjective intention or opinion. The word technê is the basis for the modern words technique and technology in every Western language, although these have a little different meaning as will be mentioned later (Parry, 2008).

The second distinction is the one between existence and essence (Heidegger, 1977). Existence is the answer for the question if something is or is not. On the other hand, essence answers the question what this thing is. These two terms are the different dimensions of being. In the tradition of Western philosophy, existence does not have a very clear definition. We know the difference between what exists and what does not, for example, as immediate presence or absence, but there is not much more to say. Most of the attention is given to essence and its follower notions because this is the content of knowledge.

These distinctions are straight forward. They form the basis of all philosophical thought in the West. The relation between two distinctions is not obvious but confusing. The source of the puzzle is the Greek understanding of technê, which is the progenitor of modern technology (Parry, 2008). Eventually the Greeks did not have the technology in our modern sense, but they had all kinds of techniques at their time which are equivalent for technology definition for our time. Also they expressed nature on the model of the artefacts produced by their own technical activity. To clarify this situation, relationship between poiêsis and physis, and existence and essence needs to be explained. In poiêsis, the distinction between existence and essence is real and obvious (Heidegger, 1977). The thing which first exists as an idea later comes into existence after human making. For the Greeks the idea of the artefact is not by chance or subjective but on the contrary belongs to a technê (Parry, 2008). Each technê has the essence of the thing before the act of making that thing. The idea is that the essence of the thing is independent from the thing and the maker

of that thing. In brief, when humans make artefacts, they do so according to a plan and for a purpose that is an objective aspect of the world.

On the other hand, the distinction between existence and essence is not certain for natural things. The essence of the thing and itself emerge and exist together. The essence does not have a separate existence. A tree emerges along with what makes it a tree. It is and what it is happen in a sense, concurrently. In point of fact, the idea of an essence of a thing of nature is our construction. It lies at the basis of science, episteme. In Greek, it means the knowledge of things, which Plato claims as true knowledge (1892).

This difference between the relation of essence to physis and poiêsis is important for an understanding of Greek philosophy and as a matter of fact naturally the whole philosophical tradition. Philosophers have tried so hard to pass over this situation. Plato's theory of ideas may be recalled as the foundation of the tradition (1892). For Plato the concept of the thing exists in an ideal realm prior to the thing itself and allows us to know the thing (Feenberg, 2005). This theory is very similar to analysis of technê in which the idea is independent of the thing. Except Plato does not only propound this theory for artefacts. Plato relies on the structure of technê to explain both artefacts and the nature. According to him this theory is applied to all being (1892).

Plato's understanding of nature is divided into existence and essence, and this understanding is the basis for Greek ontology. According to this conception there is a parallel continuity between technical making and natural self-production because they both share the same structure (1892). Technê includes an aim and a meaning for artefacts (Parry, 2008). The Greeks import these aspects of technê into the realm of nature and view all of nature in teleological terms. The essence of natural things includes an aim just as does the essence of artefacts. The world is full of meaning and intention. This conception of the world calls for a corresponding understanding of human. Although we, humans are not the masters of nature we work with the world's potentials to bring a meaning world to realization. Our knowledge in regard to that world and our action in it is not causeless. They are somehow the completion of what lies in nature.

As a conclusion, it may be provocative to say that the understanding of philosophy of technology begins with the Greeks and also it is the foundation of Western philosophy. Nevertheless the Greek understanding of being is construed through the concept of technical making. This is ironic that technology has a low role in the high culture of

modern societies. But it is in the middle of the origin of that culture. And looking with the perspective of Greeks, this theory contains the key to the understanding of being as a whole.

2.2.2. Philosophy of Technology's Modern Times

> "If modernity is shaped by technology, then the converse also holds: technology is a creation of modernity. The common wisdom of technology studies, that technology is socially shaped or even socially constructed, that it is "society made durable," implies that a full understanding of modern technology and its evolution requires a conception of modernity within which modern technology can be explained as one of its products" (Misa, Brey, & Feenberg, 2003:33).

If the status of technology in our era would be mentioned, Descartes and Bacon are the founders of modern thought (Dusek, 2006). Descartes is the one who expressed that human would become "the masters and possessors of nature" (1901) through the progress of the sciences and Bacon claimed that "Knowledge is power" (1989). These thoughts open a different gate than Greeks. According to modern thoughts, things that seem obvious to us seemed not that obvious to Greeks. However it cannot be claimed that fundamental distinctions between things that make themselves, nature, things that are made, artefacts, and existence and essence are different than their thoughts, modern understanding of these distinctions is different from theirs. This difference is especially true with the concept of essence. For modern philosophy essences are conventional rather than real (Dawson, 2007). The meaning and purpose of things is something we create not something we discover. The gap between man and world widens accordingly. This difference is related to our basic ontology.

The question to being is not what it is but how it works according to modern philosophy. Science answers this question rather than revealing essences in the old Greek sense of the term. Technology is still the model of being in this modern understanding. This was especially clear in the 18th century Enlightenment, philosophers and scientists challenged the medieval followers, with the new mechanistic worldview of Galileo and Newton. These thinkers explored the machinery of being and they identified working of the universe with a clockwork mechanism. Strange it may seem underlying structure of Greek ontology survived the defeat of its principles. In the modern context technology does not realize objective essences inscribed in the nature of the universe, as does technê. It now appears as purely instrumental, does not respond to inherent purposes, but is merely a

means serving subjective goals we choose as we wish. For modern common sense, means and ends are independent from each other. While technology often depends on artefacts, the artefacts are not the same as the technique and what defines the technique is the content of the instructions. Thus, a piano is an artefact, but what is done with it depends on the technique used by the pianist, the tuner, or the movers. Society's production possibilities are bound by what society knows. This knowledge includes the knowledge of designing and building artefacts and using them. In America it is said that "Guns don't kill people, people kill people." Guns are tools that are independent from the aim which is assigned to them by the user. Technology is neutral, has no preference between lots of possible purposes of usage (Tiles & Oberdiek, 1995). This is the instrumentalist theory of technology that is a spontaneous product of our civilization.

In this scene, technology encounters nature as raw materials as materials which awaits transformation into the things we want them to be. This world is understood mechanistically not teleological. It is there to be controlled and used without any inner purpose. At West enormous technical advances has been made according to the understanding of reality which has a motto like nothing restrains us in our exploitation of world. Everything is represented to an analytic intelligence that dissociates it into usable parts.

In the 19th century it became commonplace to view modernity as an unending progress toward the fulfilment of human needs through technological advance. It was this notion that captured the imagination of the Japanese in the Meiji era and led to the modernization of Japanese society in the 20th century. The goals of our society can no longer be specified in knowledge of a technê or an episteme, as they were for the Greeks. They remain purely subjective causeless choices and no essences guide us. This has led to a crisis of civilization which there seems no escape from, we know how to get there but we do not know why we are going or even where. The Greeks lived in harmony with the world whereas we are alienated from it by our freedom to define our purposes as we wish. So long as no great harm could be attributed to technology, this situation did not lead to serious doubts. Of course there were always literary protests against modernization. In Japan Tanizaki has his essay "In Praise of Shadows". This essay discusses traditional Japanese aesthetics in contrast with change (Tanizaki, 1977). Comparisons of light with darkness are used to contrast Western and Asian cultures but as the 20th century proceeds,

from world wars to concentration camps to environmental catastrophes, it becomes more and more difficult to ignore the strange aimlessness of modernity. It is because we are at a loss to know where we are going and why that philosophy of technology has emerged in our time as a critique of modernity.

2.2.3. Philosophical Theories Related to Technology

Philosophy of technology is just beginning to develop as a discipline (Borgman, 1984). Within this subject, well-known philosophical theories about technology will be clarified according to technology's relation to values and human actions. The scheme which Andrew Feenberg presented in his essay is going to be used to elucidate different but individually related theories:

Table 2.2 Categorization of Understandings in Philosophy of Technology (Feenberg, 2005)

Technology is :	Autonomous	Humanly Controlled
Neutral (complete separation of means and ends)	Determinism (e.g. modernization theory)	Instrumentalism (liberal faith in progress)
Value-laden (means from a way of life that includes ends)	Substantivism (means and ends linked in systems)	Critical Theory (choice of alternative means-ends systems)

In Table 2.2, the vertical axis offers two alternatives; either technology is value neutral, as the Enlightenment assumed, or it is value-laden as the Greeks believed and some of the philosophers of technology believe as well. From one small perspective a technical device is a piecing together of individual parts of mechanisms and no purpose can be seen in bringing these pieces together. But from another perspective this misses the point. Technologies, like bank notes, have a special way of containing value in them as social entities (Feenberg, 2005).

On the horizontal axis of Table 2.2, technologies are divided as autonomous or humanly controllable. Autonomous does not mean that a technology makes itself in this division. Technology being autonomous means to define how much weight humans give in this situation. If the next step in the evolution of technical system is not up to us, then

technology can said to be autonomous in the sense that invention and development have their own unique laws which humans only follow in acting in the technical area. On the other hand, technology would be controllable by humanity if next step in its evolution could be determined in accordance with our intentions.

Instrumentalism is mentioned before as the standard modern view. According to this understanding, technology is a tool or instrument of the humanity which is used to fulfil our needs. The next box over to the left is entitled determinism. This view is an important subject in social science since Marx claimed technological advance as the driving force of history (Marx & Smith, 1994). Determinists believe that technology is not under the control of humanity but it controls humanity and social organizations. Technological determinists argue that technology gets developing knowledge of the natural world to serve humanity as basic needs and faculties. Each worth the effort discovery appeals to aspects of our nature fulfils a basic need or extends our capabilities. Food and shelter are such needs. Technologies like the planes extend our feet while computers extend our brains. Ellul is not only a technological pessimist but also a technological determinist, he sees in technology a force in its own right, out of control, bearing down on us, depriving culture of its richness, society of its freedom, and human nature of its depth (Ellul, 1964). When it comes to technology, pessimism and determinism usually go together. Technology is rooted on the one side in knowledge of nature and on the other in generic features of the human species. It is not up to us to adapt technology to our relishes but we must adapt to technology as the most significant expression of our humanity.

Both instrumentalism and determinism have an interesting history in Japan. At Japan, technology is taken for granted much as were the traditions and myths of the earlier traditional society. Japan is a uniquely suitable place to evaluate philosophy of technology as it is mentioned before. The Meiji state of Japan started out with a firm with an instrumentalist view that it could adopt Western technology to enhance its power without sacrificing traditional values. The technological means imported from the West would serve Eastern goals. This was the famous idea of “wakon yosai”, as Takagi mentioned, that is a Japanese phrase implying that Western culture and learning are just for the head, while the heart remained resolutely native (Takagi, 2009). However, technology soon appeared to be undermining the values it was supposed to serve, confirming the thesis of technological determinism. It is still unclear what has happened since Japan has a

somewhat distinctive society based largely on Western technology. Yet just how distinctive it is, just how significantly it has retained its originality, is in dispute.

In order to mention different strands of technological determinism, it would be suitable to use estimation of hard and soft technological determinism (Marx & Smith, 1994). The hard-soft distinction is based upon a spectrum of technological determinisms with movement along the spectrum involving the degree of agency, or the power to effect change, attributed to technology. At the hard end, technology has certain intrinsic attributes that allow little scope for human autonomy or choice. At the other end of the spectrum, soft determinism simply emphasizes the large scope for human interventions and choice (Lawson, 2004).

In Table 2.2, the box on the lower left is titled substantivism. This is a more complex and interesting position than the understandings which have been mentioned up to now. The term substantivism describes a situation which attributes values to technology that are in contrast with instrumentalism and determinism. The contrast which has been mentioned here is actually between two kinds of values. The neutrality thesis of both instrumentalism and determinism postulated attributes to technology a formal value which can be defined as efficiency that is able to serve wide range of conceptions of good life. A substantive value on the contrary involves a commitment to a specific conception of the good life. If technology embodies a substantive value, it is not merely instrumental and cannot be used for different purposes of individuals or societies with different ideas of the good (Feenberg, 2003).

This distinction can be clarified best with examples. Take the extreme difference between a religion such as Hinduism or Christianity and money. Religions are based on substantive value choices, which reflect a favoured way of someone's life and exclude other not welcomed alternatives (Grabow, 2008). Money is a formal basis of social action. It can be used to have different kinds of things and integrated to different and contradictory ways of life. In principle, it can be said that money carries no substantive value in itself but can serve any value system. According to this example it can be questioned that whether technology is more like a religion or more like money.

On the point of substantive theory, technology is more like religion (Feenberg, 2003). Technology is not simply instrumental to any of values a person hold. It carries certain values that exactly have the same characteristics with religious belief. Technology is even

more convincing than religion because it does not require belief to recognize its existence and to follow its commands. Once a society goes down the path of technological development it will be mercilessly changed into a technological society, which is dedicated to values such as efficiency and power. Traditional values cannot survive the challenge of technology.

The similarity between substantive theory of technology and determinism can be noticed. Actually it can be said that most substantive theorists are also determinists. But the position that is characterized as determinism is usually optimistic and progressive. Modernization theorists of the post-war era such as Parsons believed that technology was the neutral servant of basic human needs (Parsons, 2008). Substantive theory does not make such assumption about the needs technology serves and if it is critical rather than optimistic. In this context the autonomy of technology is threatening and malevolent (Winner, 1978). Once unleashed the technology becomes more and more imperialistic, taking over one domain of social life after another (Feenberg, 2003).

In the most excessive imagination of substantivism, technology overtakes humanity and converts human beings into pure cogs in the machinery (Huxley, 1998). This is not utopia in a world in which human individuality has been completely suppressed. Greeks placed technê as the model of being in theory; we have transformed being technically in practice. Our metaphysics is not in our heads but consists in the real technical conquest of the earth. This conquest transforms everything into raw materials for technical processes, including human beings themselves. We are our own machines. However, although we may control the world through our technology, we do not control our own obsession with control (Heidegger, 1977). Something lies behind technology, a mystery we cannot unravel from our technological standpoint. Where we are headed is a mystery too. The West in Heidegger's view has reached the end of its rope. In his last interview, he stated; "Only a God can save us" (Augstein & Wolff, 1976, interview with Heidegger).

In table 2.2, last box is entitled as critical theory. Critical theory of technology states that humanity does not need a God to change their technological society into a better place to live (Feenberg, 1991). Critical theory underlines that substantivism highlighted the catastrophic consequences of technology but still sees a hope for greater freedom in technology. In fact the problem is not technology; it is humanity's mistake not to be ready with appropriate organizations for exercising human control over it. Societies could

domesticate technological process by submitting it to a more democratic process of design and development.

As it can be seen in the Table 2.2, critical theory shares traits of both instrumentalism and substantivism. It agrees with instrumentalism that technology is in some sense controllable, and it agrees with substantivism that technology is also value-laden. This seems a paradoxical position since precisely what cannot be controlled in the substantivist view are the values embodied in technology. According to substantivism the values contained in technology are unique to technology as such. They include efficiency and power, goals which belong to any and every technical system. Insofar as we use technology, we are engaged with the world in a maximizing and controlling fashion. This approach to the world determines a technological way of life. Obviously human control would have little significance if every way of life based on technology realized the same values.

According to critical theory the values embodied in technology are socially specific and are not sufficiently represented by such abstractions as efficiency or control (Kellner, 1989). Technology frames not just one way of life but many different possible ways of life, each of which reflects different choices of design and different extensions of technological mediation. In a museum or art gallery all pictures have frames around them. But they are not in those museums because of this reason. These frames are boundaries and holders for what they keep inside. In a similar way, efficiency frames possible technologies but it does not determine the values carried out within that frame.

That does not actually mean that technology is neutral as instrumentalism understanding shows. Modern societies must have a purpose of efficiency in areas they apply technology. The reason they cannot realize other significant values besides efficiency is because they overlook the obvious differences between them. What is worse, it overlooks the difference between their current miserable state and a better condition we can imagine and for which we can struggle. One must look down on mankind from a very great height indeed not to notice the difference between efficient weapons and efficient medicines, efficient propaganda and efficient education, efficient exploitation and efficient research. This difference is significant socially and ethically and so cannot be discounted as thinkers like Heidegger would claim (1977).

Nevertheless, the substantivist critique of instrumentalism does help us to understand that technologies are not neutral tools. Means and ends are connected. Thus even if some sort

of human control of technology is possible, it is not instrumental control. In critical theory, technologies are not seen as tools but as frameworks for ways of life (Feenberg, 1991). The choices open to us are situated a higher level than the instrumental level. We cannot agree with the instrumentalist that claims “Guns don't kill people, people kill people.” Supplying people with guns creates a social world quite different from world in which people are disarmed. We can choose which world we wish to live in through legislation either making the possession of guns legal or illegal. But this is not the sort of choice the instrumentalist claims we make when we control technology. This is what you might think of as a meta-choice, a choice at a higher level determining which values are to be embodied in the technical framework of our lives. Critical theory of technology opens up the possibility of thinking about such choices and submitting them to more democratic controls.

We do not have to wait for a God to save us but can hope to save ourselves through democratic interventions into technology (Feenberg, 2003). To say more clearly about these democratic interventions; obviously, it would not make much sense to hold an election between devices or designs for technologies. Humanity is in more on the control of technology with personal computers, they are contributing to the development of the invention process eventually. This is a subject which relies on interactivity also, as it is going to be explained later. A good example for that could be the invention of e-mail. E-mail was introduced by a skilled computer user not a designer and there are several examples related to different topics according to improvements of technology.

This involvement of society in the development process of inventions depends on interactivity as mentioned before. With the attendance of personal computers and internet connection to daily life, the basis of society contribution was shaped. Social needs and technical knowledge are the first steps that interact with each other when it is time for a technological development starts to shape.

Communication technologies accordingly reshaped and still are reshaping with these advances. Cinema is a type of mass communication and it is under the influence of new media and interactivity which are dependent on technological improvements. Today, interactivity is holding the chain of mass communication modes together. An editor gets informed about his or her new work via e-mail, learns new techniques or developments via magazines or web and most of all of these, audience is informed about this new film via TV, web, magazines but mostly internet. People prefer reading newspapers via internet and

these magazines and newspapers are developing applications to reach mobile phones, which are able to connect internet. Mass communication modes are combined eventually. To understand the interrelationship resulted by technology between these modes, next step of this thesis should be to go through communication theories and consider the statements related to technology.

> "In the nineteenth century, innovations such as the steam-powered printing press and telegraphy led to both the modern newspaper and also to journalism as an academic pursuit, while the addition of the motion picture gave birth to film theory and cinema studies" (Strate, 2008: 129).

2.3. Technology and Communication

> "We are now in a period of extremely rapid media evolution as a result of advances in information and communications technologies. The ongoing transformation of the entire range of communications media in the current environment is reflected in both the explosive development of new media technologies and increasing media convergence. As specific technologies evolve, their properties (and therefore their uses and effects) can shift—so, for example, the "interactivity" of interactive media has changed substantially over the past 40 years" (Sütçü & Orkan, 2005:1).

Humanity tried to find a way of expressing themselves beginning with Ice Age cavings as far as we know. Invention of motion pictures was a result of one of these attempts and now cinema is one of the most important branches of communication. As it is going to be introduced at third part of this thesis, motion pictures is born at the last quarter of 19th century. Like all the other communication modes, technological development of cinema is still an on going process. Within the conclusion of earlier chapter, interrelationship between mass communication modes was subject.

Since cinema is a subsection of communication branch, in this part the evolution of communication models and theories are going to be evaluated in order to understand the interactivity norm and situation of communication technologies today, so post-production sector can be evaluated.

2.3.1. Process of Communication

Communication is simply to transfer a message, an idea or information from one person to another person. To succeed the communication process this message must be understood by the receiver. (Figure 2.1)

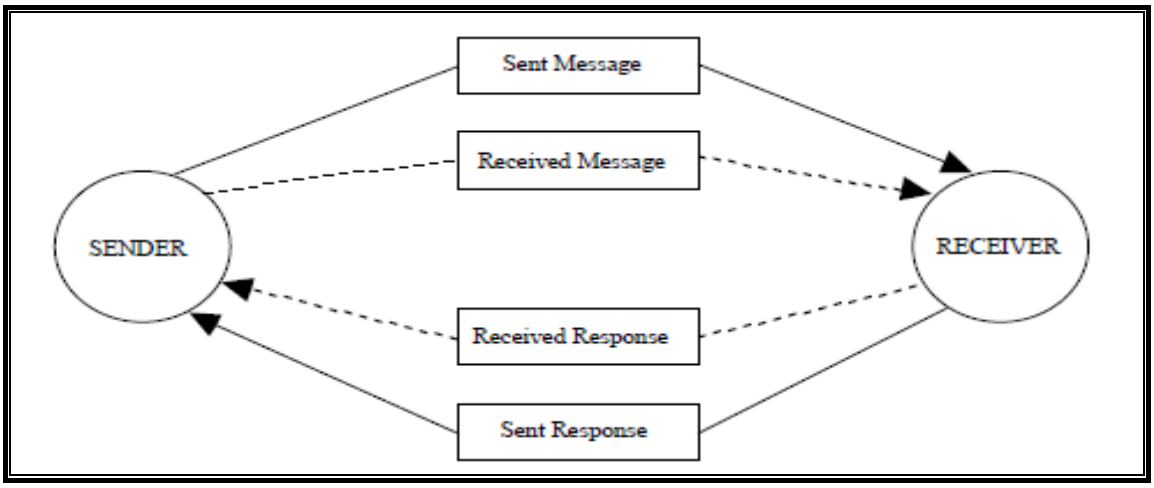

Figure 2.1 Communication Model (Adler, 1991)

> "Communication includes any behavior that another human being perceives and interprets: it is your understanding of what I mean. Communication includes sending both verbal messages (words) and nonverbal messages (tone of voice, facial expression, behavior, and physical setting). It includes consciously sent messages as well as messages that the sender is totally unaware of sending. Communication therefore involves a complex, multilayered, dynamic process through which we exchange meaning. Every communication has a message sender and a message receiver. Communication is indirect; it is a symbolic behavior. Ideas, feelings, and pieces of information cannot be communicated directly but must be externalized or symbolized before being communicated. Encoding describes the producing of a symbol message. Decoding describes the receiving of a message from a symbol. The message sender must encode his or her meaning into a form that the receiver will recognize—that is, into words and behavior. Receivers must then decode the words and behavior—the symbols—back into messages that have meaning for them" (Adler, 1991: 63).

Process of communication can be expressed as follows;

- First of all, sender creates the information which can be in any context, ideas, feelings etc.
- Secondly, this message is sent to receiver as words or symbols.
- At last, receiver translates this information or message in the way that it can be understood by his or her mind.

The main principles of communication are to have a message which can be an idea, information or feeling and a sender and receipent as mentioned. There are several types of communication though. Intra personel communication refers to internal communication within a person such as thinking, mediation or dreaming. Interpersonal communication is

to communicate people with each other, verbal or non-verbal. Group communication is people to communicate with each other within a group of more than two people.

Today we are facing mass-communication which is to communicate using a transmitter between sender and receivers. Newspapers, television, radio, internet and cinema are good examples for mass communication. Within this part mass communication and theories and modes related to mass communication and cinema are going to be evaluated.

2.3.2. Communication Theories and Models

> "The everyday view of communication is quite different from the view of communication taken by communication scholars. In the business world, for example, a popular view is that communication is synonymous to information… Communication is not simply one more thing that happens in personal and professional life; it is the very means by which we produce our personal relationships and professional experiences—it is how we plan, control, manage, persuade, understand, lead, love, and so on" (Dainton & Zelley, 2011: 2).

As shown above in Figure 2.2, there are seven roots of communication theory which are cybernetic, semiotic, phenomenological, socio-psychological, rhetorical, critical and socio cultural traditions. It can be said that communication theories are created according to these roots.

Since cinema is a production which belongs to mass communication, it is necessary to take a look at communication theories about mass communication. Six theories have been mentioned related to mass communication (Griffin, 2012). These are media ecology, semiotics, cultural studies, uses and gratifi cations, cultivation and agenda-setting theories. According to the scope of this thesis, media ecology theory of Marshall McLuhan (1964) has to be considered.

Media Ecology Theory: Luhan's theory suggests that media should be understood ecologically (McLuhan, 1964). He describes technology as the human inventions to enhance communication. Changes in technology alter the symbolic environment —the socially constructed, sensory world of meanings that in turn shapes our perceptions, experiences, attitudes, and behaviour. Also as shown at Figure 2.3, this theory describes the four step of history of human communication survey (Griffin, 2012). These four divisions are made according to life changing inventions such as phonetic alphabet, printing press, telegraph.

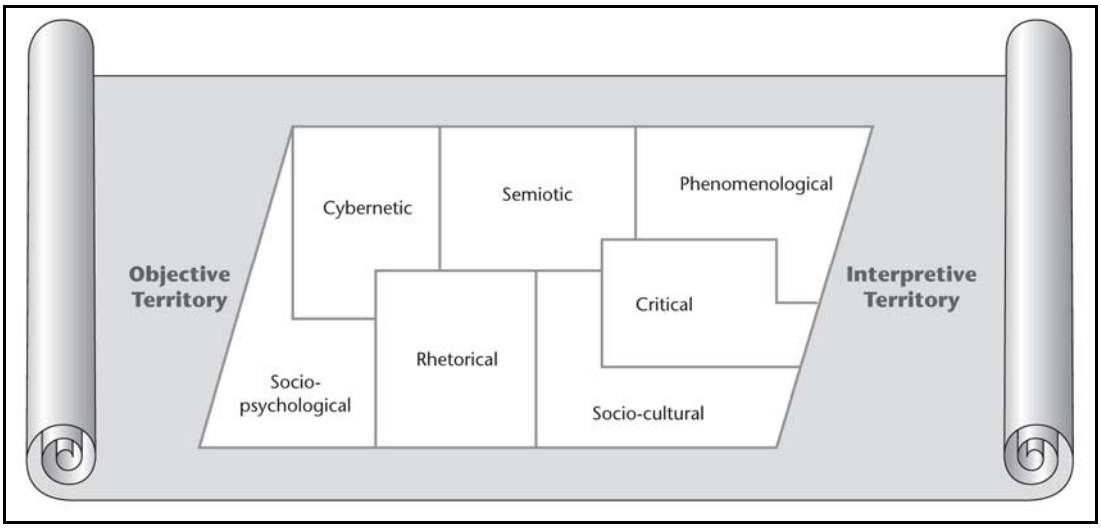

Figure 2.2 A Survey Map of Traditions in the Field of Communication Theory (Griffin, 2012)

McLuhan's theory differs from the traditional warnings against technological advances. According to his theory as long as our technologies are not chasing after us we are supposedly safe from the consequences of our creations (McLuhan, 1964). As environments, media do not determine our actions, but they define the range of possible actions we can take, and facilitate certain actions while discouraging others. The tales of Frankenstein, Blade Runner, Jurassic Park, and The Matrix assume technology gone awry and turning on its maker (Strate, 2008). He argues that technology is human inventions which developes communication. Our technologies come between ourselves and become our new environment.

> "Indeed, the study of media and their effects now seems intrinsically historical mainly because of McLuhan, and the furthering of that approach in Media Ecology. Even before the Web, back in the 1970s, most graduate programs that studied communications and media were pointed towards the future. Interactive television, telecom satellites, community cable, and all that was sparkling and new were the buzzwords. McLuhan's "global village" had already rooted that future in millennia of human constructions and attitudes, all of which were fair game for the students of Media Ecology" (Levinson, 2000:19).

We are now almost finished exploring the electronic age. McLuhan's foresight has become the reality of daily life. Communication scholars are strongly into the subject of new media and interactivity and there are predictions that if McLuhan was alive he would add digital age with the invention of computer to his media map.

Jay David Bolter and Richard Grusin (1999) refer to this process as remediation and they point out that the computer and computer networks remediate just about every other medium in existence, turning written documents, books, magazines and newspapers, paintings and photographs, sound recordings and telephone conversations, as well as radio, movies, and television, into content for websites and multimedia presentations.

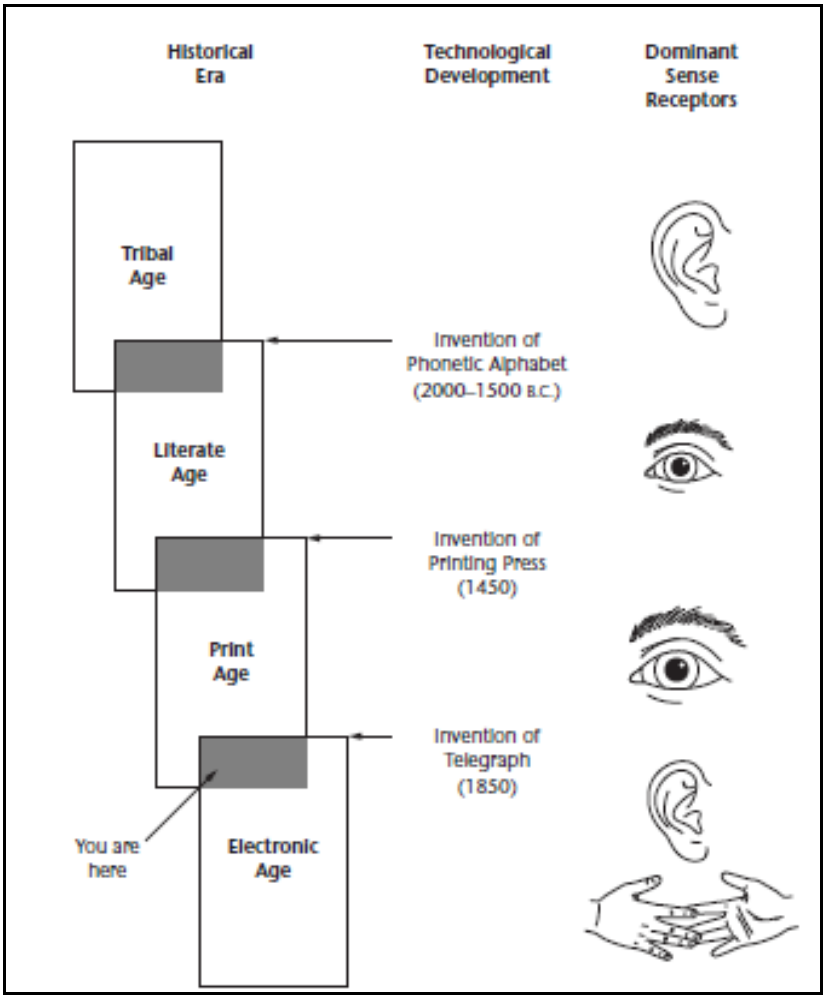

Figure 2.3 Marshall McLuhan's Media Map of History (Griffin, 2012)

When examining the communication models which have been put forward until today, two models can be chosen to compare. One of these models is Shannon's model of the communication process (1948). The other model is Foulger's (2004) ecological model of communication. Shannon's model of communication is accepted as the basis of the modern view. This model explains how communication happens and how sometimes it fails.

"Shannon's model of the communication process is, in important ways, the beginning of the modern field. It provided, for the first time, a general model of the communication process that could be treated as the common ground of such diverse disciplines as journalism, rhetoric, linguistics, and speech and hearing sciences" (Foulger, 2004).

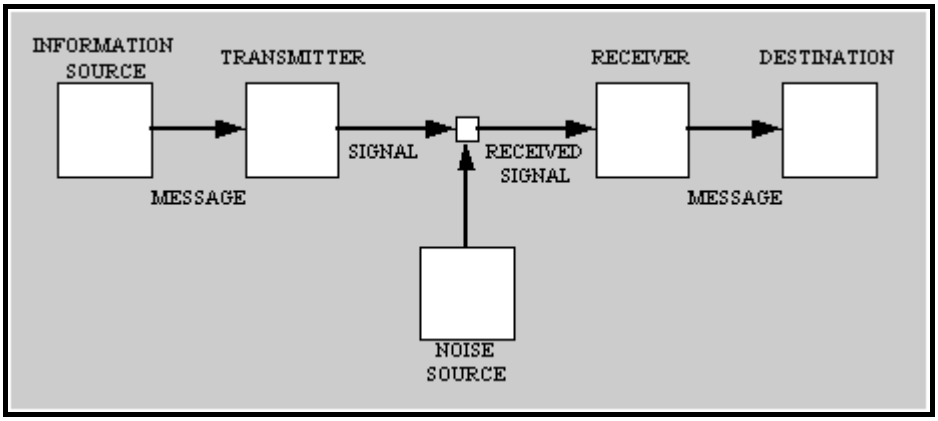

Figure 2.4 Shannon's Model of the Communication Process (Shannon, 1948)

Shannon divided the process of his model into eight components:

" 1. An **information source**. Presumably a person who creates a message.
2. **The message**, which is both sent by the information source and received by the destination.
3. A **transmitter.** For Shannon's immediate purpose a telephone instrument that captures an audio signal, converts it into an electronic signal, and amplifies it for transmission through the telephone network. Transmission is readily generalized within Shannon's information theory to encompass a wide range of transmitters. The simplest transmission system, that associated with face-to-face communication, has at least two layers of transmission. The first, the mouth (sound) and body (gesture), create and modulate a signal. The second layer, which might also be described as a channel, is built of the air (sound) and light (gesture) that enable the transmission of those signals from one person to another. A television broadcast would obviously include many more layers, with the addition of cameras and microphones, editing and filtering systems, a national signal distribution network (often satellite), and a local radio wave broadcast antenna.

4. **The signal,** which flows through a channel. There may be multiple parallel signals, as is the case in face-to-face interaction where sound and gesture involve different signal systems that depend on different channels and modes of transmission. There may be multiple serial signals, with sound and/or gesture turned into electronic signals, radio waves, or words and pictures in a book.
5. A **carrier or channel,** which is represented by the small unlabeled box in the middle of the model. The most commonly used channels include air, light, electricity, radio waves, paper, and postal systems. Note that there may be multiple channels associated with the multiple layers of transmission, as described above.
6. **Noise**, in the form of secondary signals that obscure or confuse the signal carried. Given Shannon's focus on telephone transmission, carriers, and reception, it should not be surprising that noise is restricted to noise that obscures or obliterates some portion of the signal within the channel. This is a fairly restrictive notion of noise, by current standards, and a somewhat misleading one. Today we have at least some media which are so noise free that compressed signals are constructed with an absolutely minimal amount information and little likelihood of signal loss. In the process, Shannon's solution to noise, redundancy, has been largely replaced by a minimally redundant solution: error detection and correction. Today we use noise more as a metaphor for problems associated with effective listening.
7. A **receiver**. In Shannon's conception, the receiving telephone instrument. In face to face communication a set of ears (sound) and eyes (gesture). In television, several layers of receiver, including an antenna and a television set.
8) A **destination**. Presumably a person who consumes and processes the message" (Foulger, 2004).

On the other hand, Foulger (2004) argues that while technology is developing and media systems are evolving, models of communication have to be constructed upon these new specifications. Because of that, Foulger created a new model of communication, which he called the Ecological Model of Communication (Figure 2.5).

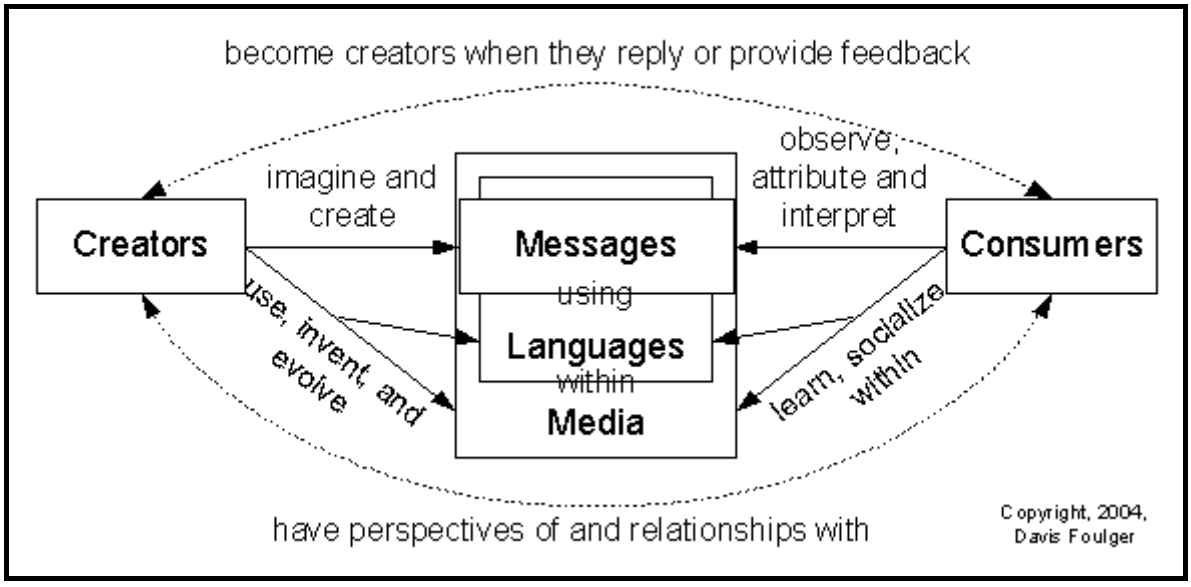

Figure 2.5 Foulger's Ecological Model of Communication (Foulger, 2004)

Specifications of these model are listed as follows:

" 1. Messages are created and consumed using language

2. Language occurs within the context of media

3. Messages are constructed and consumed within the context of media

4. The roles of consumer and creator are reflexive. People become creators when they reply or supply feedback to other people. Creators become consumers when they make use of feedback to adapt their messages to message consumers. People learn how to create messages through the act of consuming other peoples messages.

5. The roles of consumer and creator are introspective. Creators of messages create messages within the context of their perspectives of and relationships with anticipated consumers of messages. Creators optimize their messages to their target audiences. Consumers of messages interpret those messages within the context of their perspectives of, and relationships with, creators of messages. Consumers make attributions of meaning based on their opinion of the message creator. People form these perspectives and relationships as a function of their communication.

6. The messages creators of messages construct are necessarily imperfect representations of the meaning they imagine. Messages are created within the expressive limitations of the medium selected and the meaning representation

space provided by the language used. The message created is almost always a partial and imperfect representation of what the creator would like to say.

7. A consumers interpretation of a messages necessarily attributes meaning imperfectly. Consumers intepret messages within the limits of the languages used and the media those languages are used in. A consumers interpretation of a message may be very different than what the creator of a message imagined.
8. People learn language by through the experience of encountering language being used within media. The languages they learn will almost always be the languages when communicating with people who already know and use those languages. That communication always occurs within a medium that enables those languages.
9. People learn media by using media. The media they learn will necessarilly be the media used by the people they communicate with.
10. People invent and evolve languages. While some behavior expressions (a baby's cry) occur naturally and some aspects of language structure may mirror the ways in which the brain structures ideas, language does not occur naturally. People invent new language when there is no language that they can be socialized into. People evolve language when they need to communicate ideas that existing language is not sufficient to.
11. People invent and evolve media while some of the modalities and channels associated with communication are naturally occurring, the media we use to communicate are not" (Foulger, 2004).

The classic outline of the study of communication can be simplified as: Who ... says what ... in which channel ... to whom ... with what effect (Lasswell, 1948). The ecological model can be understood as a more detailed elaboration of this classic outline of the study of communication.

> "In the ecological model, the "who" are the creators of messages, the "says what" are the messages, the "in which channel" is elaborated into languages (which are the content of channels) and media (which channels are a component of), the "to whom" are the consumers of messages, and the effects are found in various relationships between the primitives, including relationships, perspectives, attributions, interpretations, and the continuing evolution of languages and media" (Foulger, 2004).

As technology develops, communication systems evolve simultaneously. Theories and models have to be constructed according to current spesifications. Basic elements of communication are always same and upgrades are constructed on these main principles. However, tools of communication do not remain the same.

Cinema, as a mass communication form, does not remain the same also. The main idea of this thesis is to evaluate these upgrades and to carry forward researching, concepts of interactivity and new media have to be mentioned. In this thesis main aim is to evaluate technological improvements at post-production area in cinema sector and electronic media age and interactivity are significant characteristics of this era.

These days, when a film is ready to be presented to the audience, mass communication is used to reach them. People can see the poster of this film on magazines, newspapers or teaser of this film on TV or internet. On the other hand, lots of people prefer to read daily news from these newspapers' websites. Today, newspapers and magazines are creating mobile phone applications to reach their readers. Readers are able to leave comments under the article or news they read. Mass communication is in a complex situation. Mobile phones are not only for calling each other anymore, internet connection is everywhere and even coffee shops are giving internet service to their customers. Interactivity is in the middle of this situation for this reason interactivity and new media are going to be next subject of this thesis.

2.4. Interactivity's Place in Technological Improvements

Today, when a person wants to find the nearest hospital, he or she can simply look up this from his or her smart phone. According to the researches performed by Ofcom, which is the media regulatory board of England, as from 2011, adults who have smart phones are 27% and for teenagers this number rises up to 47%. 71% of these people state that they never turn off their phones. 8 million people in the UK accessed the internet on their mobile phone in the first three months of 2009, up by 42% on a year previously (Ofcom, 2009). And a technology research company Gartner indicates that total number of smart phones that are sold until today is 428, 7 million (Gartner, 2011). What is more that number will reach up to 468 million by the end of 2011 (Pettey, 2011).

Apple presented their new iPad 2 in the beginning of 2011. This smart device can be used as both personal computer and mobile phone with a touch screen. There is a new business sector that contains application designing for Apple's iPhone, iPod touch and iPad and other smart phones and tablet computers of other brands. A musician can download an application for attuning his guitar or a photographer can use various applications that caries the specialties of various analog and digital machines. And these applications even allow you to choose the kind of film or lens you want to use. Also as a topically relevant example, a videographer is able to shoot a video with a smart phone application with the option of choosing various filters, lens or frame types and wait for a small processing time, and have a high definition video which is automatically edited.

Technology of course made and continuously making huge changes in our lives. By change I mean, of course, not just change in the sense of bigger and better models and new ways of doing the same things you were doing before, but qualitative change in the structure and behaviour of the society in which you live (Burke, et al., 1985).

Editors can learn new techniques, follow the commentary of the work they applied, even they can send certain amount of data to other operators such as sound engineers of that film via internet. The structure which is in the middle of this interlocked chain is interactivity. It is now the main ring of this chain.

It must be accepted that there are large amounts of options that today's technology is able to offer to us. On the other hand, as mentioned before, the term technology is powerful component which has been argued as having a great control on our lives. But as expressed in instrumentalism understanding, society can be able to use technology in order to satisfy its needs (Kuhn, 1996). Philosophy of technology shows us that there are various thoughts about society and technology trying to understand which of them has the control over the other.

Technological improvements depend on the development of existing knowledge as mentioned earlier. High level of interaction between human and computer provided these existing knowledges to travel faster between innovators. Today it is available to reach information related to any subject via internet. This leads us to the rapid development of technology in the age of new media. Communication is both the vehicle which carries knowledge from one to another and a product which is also affected from the development of knowledge itself.

As mentioned earlier, in this digital age of communication and cinema, interactivity and new media are the basic elements. Communication is interactive today, and new developments of communication technologies are promising interactive innovations even in their commercials. Post-production users of cinema are affected by the rapid advances of technology and mostly digital workstations are used within this process. Within analyse part of this thesis, several interviews are completed with post-production workers. Some of the questions are related to computer and internet usage of these users. They are asked how they follow technological improvements or audience commentaries of post-production, how their relations are with digital workstations. Post-production sector is based on a human-computer interaction today. Different branches to complete their jobs in this whole process depend on this interaction. Therefore this leads us to review the researches related to norms, interactivity and new media.

2.4.1. Reaction to Knowledge and Reasons for Change

The cognitive model, then, is what sets the rules, defines the structures, bestows meaning, and sets up the ethics, values, beliefs, and knowledge-everything that permits the user to function as a sentient organism, because it provides a perceived reality. The cognitive model is a model based on knowledge that tells you which way is up, if you like. The model, then, determines what the universe is (Burke et al., 1985).

According to this understanding, human's perception receives the information to create and identify knowledge. And this information is held by a recognition system which is our cognitive model. Anything that cannot be recognized by this system is naturally rejected as meaningless. Of course, the meaning is defined according to the observer's neurophysiologic construct, not anybody else's.

With this cognitive model explanation it will be expressed why society needed change in the first place. Back in the twelfth century, it was known at Europe that Sun was going around Earth because Aristotle and Church accepted that way. It was thought to be perfect and unchanging because it was created on day one of creation by Divinity. On the other hand Chinese were observing the movements at sky and logging these actions owing to understand the reasons with curiosity. Chinese specialized in astronomy centuries before Europeans did. That was because there was belief in European model and Chinese had

nothing in theirs. Comets and supernovae were thought as warnings from God by Europeans. Of course that cannot be the first example for cognitive model. As it is mentioned, technological movements go back to conscious usage of fire or invention of wheel whether these were not swiftly growing improvements. These were all consequences of gathering information to form a useful creation.

The essence of technological modernity is floating. Many philosophers have seen that technological change has become self-propelled and autocatalytic, so change feeds on change. Unlike other forms of growth, spiralling technological progress does not appear to be bounded from above. Predictions in the vein of "everything that can be invented already has been" have been falsified time and again. The period after the Industrial Revolution had an immense effect of strength on innovation that cannot be ignored. Major breakthroughs and a cluster of macro inventions were followed by waves of micro inventions and secondary extensions and applications. The dynamic has become non-ergodic; the present and the future were nothing like the past. In the pre-modern past, whether in Europe or elsewhere in the world, invention had remained the exception.

In the second half of the nineteenth century and even more so in the twentieth century, change has become the norm, and even in areas previously untouched by technological innovation, mechanization, automation, and novelty have become inevitable. There is no evidence to date that technology in its widest sense converges to anything (Mokyr, 2005).

One of the most common ways change is generated is through interaction between one factor and another, and usually in unexpected concatenations (Burke et al., 1985). Change does not always come up as it is being searched for. In science and technology there are various examples that shows us some of the changes were faced while invention process of an individual artefact was going on. Every new piece of information changes the existing situation of knowledge. It can be said that there is a domino effect with change. When cannons were invented at 14th century, the demand for metal was pushed up, so mining progress became harder because miners had to go down deeper for more metal. During mining at deeper levels they discovered that it was getting wetter directly proportional with depth. But their old water suctions were not enough to lift up that amount of water more than 30 feet. Somehow Italian scientist Toricelli found out this situation was related to atmospheric pressure (Complete Dictionary of Scientific Biography, 2008). After that there

was a new basis for science and this came with the invention of barometers, air pumps and a new view of interstellar space.

When Galileo looked through telescope he saw Jupiter had satellites circling around it. This situation changed the idea that Earth was the centre of everything and took humanity off its special philosophical pedestal and religion was hit in such a way that it was never fully recovered. Techniques are not “true” or “false”. Either they work according to certain predetermined criteria or they do not, and thus they can be interpreted to confirm or refute the propositional knowledge that serves as their epistemic base (Mokyr, 2005).

This developments are provided by shared knowledge and today knowledge can be shared faster and worl wide because of the high level computer and internet usage. Also improvements at post-production technologies are formed via human-computer interaction since digital workstations are in use for whole process. For analyse part of this thesis, users are questioned about disadvantages and avantages of digital editing techniques and benefits and disadvantages for sector. In order to complete analyses, the researches related to interactivity have to be reviewed.

2.4.2. Interactivity and Communication

Interactivity is generally considered to be a natural result of face-to-face communication, but it is seen in mediated communication systems as well. Within this thesis, approach is to consider human-computer interaction in order to reach current situation of post-production and cinema technologies. Also besides working with them, users are in interaction with computers to follow new techniques and commentaries related to their works and techniques.

As mentioned before communication systems today are in a interlocked relationship with the existence of interactivity. In the interest of evaluating this situation, definitions of interactivity should be considered.

Interactivity is an assumed attribute of interpersonal communication (Wu, 1999). On the other hand besides human-human interaction there is another field which is human-computer interaction as expressed before. Interactivity has been identified as a core concept of new media, although nearly three decades of research and analysis, society hardly knew what interactivity is (Bucy, 2004).

Interactivity is the extent to which users can participate in modifying the form and content of a mediated environment in real time (Steuer, 1992). The more spontaneously a user comprehends their actions in a mediated environment, the higher he or she perceives interactivity.

Researchers became very interested in scholarship that has a scope in exploring how humanity interact through media, the nature of interactive content, and how individuals interface with communication tools which hosts interactive communication. In this part of this research, the inferences of observers which tend to explore interactivity are going to be reviewed.

The role of interactivity on faster communication and easy to reach information depends on internet usage. With the rapid rise of the Web as a commercial medium, interactivity emerges as a unique characteristic distinguishing the Web from other traditional media, which was called as First media Age also (Wu, 1999).

Interactivity can be characterized in letters to the editor, listener participation in programs talk shows on radio or television. In the early 1990s, use of the term 'interactivity' exploded in the popular, trade, and scholarly press (Lievrouw & Livingston, 2006).

Interactivity is considered to be a basic property of new media in general. But that cannot be said that all elements of new media are interactive. It is important to find out what makes them interactive. And also realizing that interactivity is assigned in different meanings to different people in different contexts is important.

Interactivity is not only special to new media as we mentioned before. But new media enables interactivity to come up in new environments. And, the concept of interactivity has become a widely recognized research subject in the context of new media. For this reason, it is important to have a basic understanding of new media and its key concepts related to interactivity before examining interactivity profoundly.

Many researchers tend to write about new media since they had discovered the recently developed state of networked computing and telecommunications. It can be said that new media are not completely new, in some cases they have been developing out of old media. In addition to this, the concept of new technology is not special to the present digital revolution.

Williams, Rice and Rogers identified three characteristics of new media as interactivity, de-massification and asynchronicity and yet new media not only de-massify but also create

a continuum between formerly discrete categories of interpersonal and mass-mediated communication (Williams, Rice & Rogers, 1988).

There are researchers that attempted to make historical linkages between new and old media. Leonhirth, Mindich, and Straumanis compared e-mail list to telegraph, the round table and the bonfire (Leonhirth, Mindich & Straumanis, 1997). Some researchers stated that the terms which are used to define new media are actually interdependent on old media styles. But other authors have suggested that terms used to define new media are too dependent on old media forms. According to Murray, the term multimedia, which most researches use to mean the digital integration of media types within a single technological system, is a word which has some descriptive power. He compared the word 'multimedia' as a descriptor of new technology to the term 'photo-play' which was used to describe early films. He also thinks that new media provides a new digital presentation form for all the major representational formats of the previous five thousand years of history (Murray, 1997). Another author, Marvin was interested on the interactive relation between new and old objectives in new media. She suggested that the coexistence of the old and new which becomes an attraction centre creates tension because it is new fangled (Marvin, 1988).

This new digital technologies, despite their synthetic capabilities do not yet seem to be eliminating other media. Rather, a recent study reported that many individuals actually use their computers concurrently with other older media such as television (Lievrouw and Livingston, 2006). Instead of eliminating older media, new media is interlocking with old media. However new media are extremely related to old media naturally, there are some distinctive specific characteristics of new media. It can be said that other major differences between them are greater user control and choose. People are able to watch TV via their computer or mobile phones today.

At the old media era, new media was forming in a one way environment; user was just getting involved by staying on a side of this way and staring. Now the situation is that, user is also forming the new media participation, this is interactivity. The role of the user has changed with his or her contribution to interactivity process. Manovich has a list of specifications he used to consider new and old media:

1. "New media is analog media converted to a digital representation. In contrast to analog media which is continuos, digitally encoded media is discrete.

2. All digital media (text, still images, visual or audio time data, shapes, 3D spaces) share the same the same digital code. This allows diffirent media types to be displayed using one machine, i.e., a computer, which acts as a multimedia display device.
3. New media allows for random access. In contrast to film or videotape which store data sequentially, computer storage devices make possible to access any data element equally fast.
4. Digitization involves inevitable loss of information. In contrast to an analog representation, a digitally encoded representation contains a fixed amount of information.
5. In contrast to analog media where each successive copy loses quality, digitally encoded media can be copied endlessly without degradation.
6. New media is interactive. In contrast to traditional media where the order of presentation was fixed, the user can now interact with a media object. In the process of interaction the user can choose which elements to display or which paths to follow, thus generating a unique work. Thus the user becomes the co-author of the work." (Manovich, 2002: 66)

David Holmes (2005) described old and new media as first media age and second media age, and explained their characteristics in a scheme:

Table 2.3 Comparison of First Media Age and Second Media Age (Holmes, 2005)

First Media Age	**Second Media Age**
Centred (few speak to many)	De-centred (many speak to many)
One-way communication	Two-way communication
Predisposed to state control	Evades state control
An instrument of regimes of stratification and inequality	Democratizing: facilities universal citizenship
Participants are fragmented and constituted as a mass	Participants are seen to retain their individuality
Influences consciousness	Influences individual experience of space and time

Before online communication and personal computers were common, mass media industries such as newspapers, books, movies, radio, and television, created and marketed packaged content to be used up by passive audiences. Mass communication researchers studied the one way flow of communication to consumers. In the mid 1980s, researchers began to explore about new technologies bringing interactivity to mass media. Some of them described new media as communication technologies that allow or facilitate interactivity among users or between users and information. This is the current look now new media became with participation of users.

> "Properties of participant internet communities, internet medium appears to be the manifestation of the postmodern society. Because we are using the tools and spaces that reflect our culture. Real life relations in physically based internet communities impact online relations which cause narrow social context accordingly. This is whaterver in our real lives, there exits the same cases, on the internet. Because people have tendency to move the media habits to other media" (Algül, 2011).

Related to the user participation and interaction in formation of new media Heeter's (1989) approach should be useful. Heeter (1989) offered seven observations about interactivity in emerging media systems:

- Information is always sought or selected, not merely sent.
- Media systems require different levels of user activity. Users are always active to some extent.
- Activity is a user trait as well as a medium trait. Some media are more interactive than others; some receivers are more active than others.
- Person-machine interactions are a special form of communication.
- Continuous feedback is a special form of feedback in which behaviour of all users is measured on an ongoing basis by a source (e.g. videotext system) or gatekeeper (e.g. cable operator).
- The distinction between source and receiver is not present in all media systems.
- Media systems may facilitate mass communication, interpersonal communication, or both. (Heeter, 1989)

It is important to note that interactivity is neither inherently positive nor negative. The extent to which interactivity helps or hinders is a function of a variety of factors including the nature of the interaction, the objectives to be accomplished, and the interactants themselves (Burgoon et al., 1999). Interactivity researchers seem to continually discover

the same processes and classification schemes identified by previous scholars years or decades earlier. How deeper the researchers go into the interactivity notion they are tend to be reaching the same assumptions which earlier researchers emphasised. A persistent problem with interactivity studies is that, following a period of initial fascination, researchers tend to lose interest after introducing their competing definition or typology and move on to other topics (Bucy, 2004).

For interactivity to be successful as a concept it must have some social and psychological connection. Indeed, beyond the specific deficiencies which are explored already, what is missing from the literature is a broad statement of interactivity's common patterns of impacts on users the predictable outcomes that interactive processes may have across different user groups (Bucy, 2004). As Rafaeli and Sudweeks rightfully observe, "We are still far from a theory of interactivity" that offers a coherent framework for systematic investigation to proceed (Rafaeli & Sudweeks, 1997). This is because I believe a result of increasing level of interactivity in society and technology. This relationship between them is continuous and does not seem to be slowing down on the other hand it is speeding up more and more.

For at least the last hundred years, technology has played an important role in visions of the future. Future societies are rarely ever conceived of or presented without future technologies and often the development of new technologies is used to explain how we could transition from present social structures to different social structures (Dyson, 2009). It must be accepted that while humanity is searching for higher technology, society has no chance but change. Change is inevitable.

It has been explained that there are several understandings about the formation of technological improvements and technology itself. The common ground for all of them is technology to be somehow formed with combinations of knowledge. Even it is autonomous or controllable, or neutral or value-laden, in a sort of way it is including knowledge eventually.

The development of techniques and equipments at any area is depending on the earlier ones as I mentioned before. This situation can be best explained with the combination of knowledge approaches which includes high level of interactivity. Even in a historical perspective, maybe interactivity should not be a matter of fact but combination of knowledge is current.

Interactivity in a different point of view is the key element that speeds up the technological developments. This is the main role of interactivity on technological improvements. Between these two norms there is a chain reaction that both of them affect each other simultaneously actually. Interactivity is speeding up the formation of new technologies and these new technologies are increasingly in a more interactive format.

After telephone was invented and developed, computer was introduced to users and with the combination of computer and telephone lines, internet connection came to agenda. Which was earlier in a limited level and now we are carrying in our pockets with our smart phones.

Technology is a copy, transform and combine action in other words. And knowledge is spreading quickly because of the benefits of interactivity. It is easier to reach knowledge in any context. Innovators are copying knowledge related to earlier technologies, transforming them into the means of needed usage, and combining this knowledge to create a newer technology.

Apple developed the first personal computer with the model names Lisa and Macintosh based on the design of Xerox's Alto (Linzmayer, 2004). Although the invention of personal computers is not the courtesy of Apple both Lisa and Macintosh are the pioneers of a new concept that is computer as a household appliance. Xerox neither foreseen Alto as a simple end-user product that parents would buy to their children as a gift nor thought computers could become a household appliance like a TV-set. As a result it is widely known by ordinary people that Apple's Lisa and Macintosh are the initial personal computers. Apple's designers copied the basics for a personal computer from Xerox, transformed it with their own ideas and combined these ideas to create a better product from their point of view.

Humanity's interaction with computer evolved with keyboard usage, got higher with invention of mouse and currently in the highest level with touch screen technologies. Increasing level of this kind of interactivity became a reason for new technologies to establish quicker as the relationship of human and computer evolved. Today generally simple procedures in most contexts are completed via computers. Post-production technologies are within one of these contexts and my further research is based on historically evaluation of technological improvements at post-production area at cinema

sector. In order to analyse effects of technological improvements on this sector, historical evaluation is necessary.

3. HISTORICAL EVALUATION of TECHNOLOGICAL IMPROVEMENTS at POST-PRODUCTION

At cinema, at home on television or on personal computer; even there is a historical development of techniques, watching a movie is an irreplaceable hobby for most of people. It can be said that technology did not replace cinema with any other option, it caused changes to occur in some of the subjects and methods. According to MPAA (Motion Picture Association of America) number of films began production in 2010, including non-members of MPAA that are working with any other US production company, is 754. Every one of them has a different release date (MPAA, 2011b). The reasons for this situation are the production start date as month and day naturally, and the fact that every one of them has a longer or shorter production and post-production process. But if the timing is put aside, every film undergoes almost the same post-production process.

On the other hand, it is acceptable that most of the people are trying to understand how the film they have been watching is made. People know sets, the physical elements that are constructed or arranged to create a sense of place, they nearly understand how the film is being shot there. Social media users share photos from sets which were taken during film was shot. But audience have a limited idea about how these shots became the film they are watching.

Figure 3.1 La Sortie de l'Usine Lumière à Lyon (1895) (Feira, 2010)

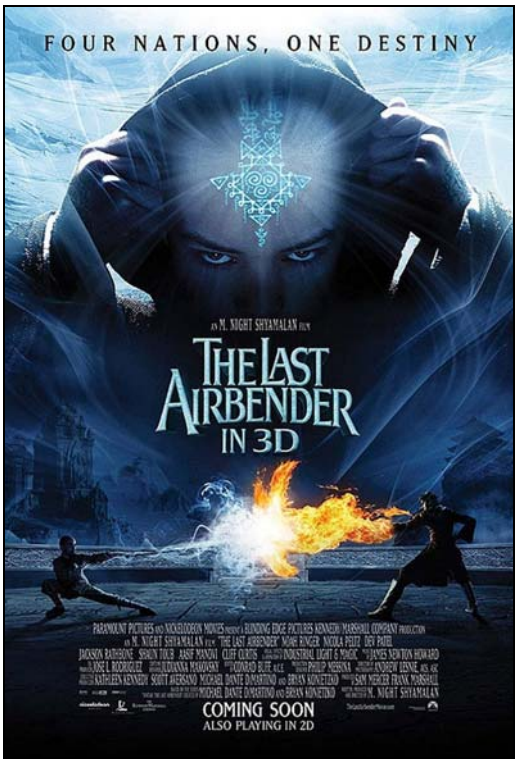

Figure 3.2 The Last Airbender (2010) (Avatar Wiki, 2011)

In fact sometimes scenes are being shot from various different angles and over and over again, for example when an actor speaks the wrong line or boom accidently drops into the shot. The dialog of two people is usually being shot with two or more cameras actually. And often different shots which were shot at different places and different times are becoming one scene that tells a single period of time. Sometimes filmmakers shoot a scene without recording the sound and it is added afterwards. The process of creating the final shape of the scene in film that is released is post-production.

Cinema began as a technology of public projection, but it continues to develop as a screen-based media culture (Bennett, Furstenau & Mackenzie, 2008). In case the film of Lumière brothers, "La Sortie des usines Lumière à Lyon" (1895), which is known as the first motion picture attempt with speed of 16 mm per seconds and 46 seconds length and Shamalayan's "The Last Airbender" (2010) which is a 3D film are compared, the quite big changes that comes with technology spring on. "La Sortie des usines Lumière à Lyon" was not an edited film, these years editing was not an available technology. In recent years, technology has become a central issue in film studies, as cinema has been forced to contend with technological developments in other related media, and with the emergence

of the so-called new media (Bennett, Furstenau & Mackenzie, 2008). As it is mentioned before, change is inevitable.

3.1. General Overview on Post-Production Process

As a general word meaning it can be said that every production procedure has a post-production phase. In everyday life an example of post-production always confronts society. The editing procedure of the product before presenting it to the customers is post-production. There is an example of post-production everywhere in daily life where there is a productive action. But in concept of this research, the context which is going to be used is the motion pictures industry. This concept includes films, soap operas, TV programmes and even in commercials we are watching on TV. In this thesis, the approach is going to be mentioning the evaluation of post-production in interaction with developments of technology according to cinema sector.

3.1.1. Definitions of Basic Terms Used Within Post-Production Process

In order to talk about post-production process there are some basic terms to be explained which is going to be used during the subject. As mentioned before, post-production process does not only include visual editing, also includes sound editing. The orders of these processes can change according to some circumstances related to scenes, editors, operators and timing of production. Sometimes recorded sounds can be edited before fine cut or after it. Colour correction can be done after the cut or before printing master negative. The systems and methodology are changed depending upon technological developments. A cellular phone ring or a gun burst sound is usually inserted after the scene is shot within this sound editing process. But preparing the music of the film is a whole different process and that can be done after the basic sounds are edited or before that or these can be done simultaneously. Usually this process is established after the music tracks are recorded and sent to mixing for levelling of sounds, dialogues and music. However it must be accepted that these conditions can show an alteration production to production.

A film may be photographed in two months; editing can take twice that long. The popular image of making a movie is one in which the director is on the set, the cinematographer is

behind the camera, and the actors are in their costumes. In reality, however, simply photographing a movie is only the beginning of the filmmaking process. Next comes post-production, the crucial stage during which all the "raw materials" that the director, cinematographer, and the actors have created are combined with other content which are sounds, music, visual effects, and crafted into the film that eventually is shown in theatres. Post-production also requires the services of a cadre of talented artists; first and foremost is the editor, but there's also the sound editor, the composer, the Foley artist who creates sound effects, visual effects supervisor and visual effects artists, the colour timer, and other talents (McKernan, 2005).

In British studios the director is usually the key figure in production. He collaborates on the shooting script and supervises the editing. The responsibility for the final continuity of a film rests with him and the editor. In Hollywood, the reverse normally happens. Writers normally prepare their scripts in much greater detail and leave the director with the comparatively minor role of following the written instructions. In America, moreover, the producer is generally much more closely concerned with the creative part of production than is his British counterpart. The American producer almost invariably supervises the editing of the film, a stage of production which in most Hollywood studios is no longer held to be the director's responsibility (Reilsz & Millar, 2010).

And of course the editing process has changed and still changing as time passes and technology improves. However this improvement and conditions appeared as a reason of this improvement are going to be discussed later. Within this chapter of the research I am going to explain this procedure in a comparative approach between traditional and contemporary basic orders. In order to be explaining this procedure in full context, including all technical details and materials, the production phase should be told in detail. The main purpose of this thesis is to express the effects of technological improvements on post-production area at cinema sector, considering the effects of interactivity; this is because my approach is not going to obtain technical phases detailly.

First of all it is going to be useful to understand the basic terminology of post-production process. In these premises important terminology of post-production process are as explained below:

- Sequence - A number of shots joined together that depict a particular action or event in a longer program. Sometimes likened to a scene, but a longer scene may have several key sequences play out inside of it. (Thompson & Bowen, 2009)
- Scene - In film terms, scene means location. Changing the locations refers to changing scenes. A scene can be shot from different angles, sometimes with two or more cameras (Case, 2001).
- Shot - A shot briefly refers to the time interval, beginning with the starting to recording and stopping the recording at a time. What the camera sees in that time interval. For example, tracking shot would mean that the camera is following a character or character as he walks in a scene. Wide shot would mean that we see every character that appears in the scene, all at once (Dancyger, 2011).
- Take – A take can be referred as a shot attempt. Every shot try, taken from same angle means a take (McKernan, 2005).
- Cut - A cut has two different meanings. First one refers to a draft of the film and the second one is used to indicate the end of a shot. (Dancyger, 2011)
- Cutting Room - The cutting room indicates the editing room. This is the place where the editor cuts together the film (McKernan, 2005).
- Rough Cut - A rough cut is the editors first cut of the footage. At rough cut, the shots from different angles are combined to form a meaningful scene. That can be more understandable with this example; with a dialog of two people in a group, the facial expressions of other actors without words are added to the conversation. That action belongs to rough cut (Case, 2001).
- Fine Cut - A fine cut is usually the editors cleanest and smoothes cut. It is the final cut. After rough cut editor adds or extracts some pieces of these footages or some animations can be added and colour correction can be made. At fine cut, the film usually becomes what is shown at cinema, of course only as visual perspective (Dancyger, 2011).
- Cross-cutting / Parallel-editing – In the editing room, different shots which were taken at different times can be combined to create a meaningful story. For example watcher sees a child eating an apple at a living room of a house. Then it cuts and a woman, probably that child's mother, washing dishes in kitchen. Then another cut which shows the child comes. This situation gives watcher the sense that these two

actions are happening simultaneously. This technique is called cross-cutting (McKernan, 2005).

- Keyframe - A keyframe is a frame that contains specific settings. By setting multiple keyframes, you can adjust these parameters as the video plays to animate certain aspects. For example, editor can set a keyframe for scale at 100% and set the next one at 50% and between these keyframes, scale of the footage changes from 100% to 50% (Case, 2001).
- Telecine - The process of scanning film in real-time and outputting it to a tape-based format (Dancyger, 2011).
- Non-linear editing - An editing system in which edits can be performed at any time, in any order. Access is random, which means that the system can jump to specific pieces of data without having to look through the whole footage to find it. Computer software such as AVID and Final Cut Pro are examples of non-linear editing systems (Case, 2001).
- Linear editing - A form of video editing in which cuts are laid out sequentially, one by one, to produce the final scene. This is in contrast to non-linear editing in which cuts can be performed in any order (Case, 2001).
- Offline editing - The process of editing a project at a lower resolution than the final output, in order to cut equipment costs or reduce disk space - or in the case of film projects, to preserve the original negative (Dancyger, 2011).
- Transitions – This term refers to the style of combining two shots by editor, to what happens between two shots. Sometimes the shot ends with blackening and the other shot begins from that black colour and lightens slowly until it reaches its own colour. This blackening is an example of a transition. For example dissolve is a transition used in editing. It is when the editor takes two shots and the end of the first one blend into the beginning of the next. The first one dissolves into the next. This is often used in film to indicate a large passage of time between the two shots (Case, 2001).
- Motion artefact - Visual interference caused by the difference between the frame rate of the camera and the motion of the object. The most common display of this is when filming a computer or television screen. The screen will flicker or a line will

scan down it, and is caused by the difference in frame rates and a lack of synchronization between the camera and television (McKernan, 2005).

- Synchronous sound – The sound which is recorded simultaneously with shooting is synchronous sound which is known as sync-sound (Dancyger, 2011).
- Asynchronous - In a film, it seems like we are constantly hearing the natural sound from the scene. Sometimes the filmmakers record the natural sound of the scene, but often they will shoot the scene without any sound and add the sounds one would hear in that scene later. This is asynchronous sound (Dancyger, 2011).
- EDL – Edit decision list showing which cuts will be performed during editing (McKernan, 2005).
- VFX – The abbreviation used for visual effects (Case, 2001).
- SFX - Abbreviation for sound effects (Case, 2001).
- OMF (Open Media Framework) - A file format intended for transferring media between different software applications on different platforms. It is commonly used for transferring audio from the timeline in Final Cut Pro or AVID to Pro Tools sessions (Digital Rebellion LLC, 2011).

3.1.2. Earlier and Contemporary Editing Basic Workflows

There are several film and video editing software on the market today. But it should be accepted that Apple's Final Cut and AVID's Media Composer are the most common professional software contemporarily used for editing. In the middle of 2011, Apple announced that Final Cut Pro is released with a newer version, X, but excluding some services that are important for professional digital editing sector (Pogue, 2011). Final Cut's role will have a change of place for professional editors in the upcoming months for sure but it can be accepted for now that it is still functioning. For this reason, while explaining the process order of film editing, the names of such software are often going to be used.
Essentially, there are six possibilities for how you initiate, proceed with, and complete a visual project:

"1. Shoot on film, edit on film, and finish on film.
2. Shoot on video, edit on video, and finish on video.
3. Shoot on film, edit on video, and finish on video.

4. Shoot on film, edit on video, and finish on film.
5. Shoot on film or video, edit and finish on video, and transfer to film.
6. Shoot on film or video, edit and finish on video, create a Digital Intermediate (DI), and finish on film." (Mamer, 2009)

The basic terminology of editing which is used here is mostly related to digital editing. However we can say that the outcome of digital editing is already related to the traditional editing methods. They are the starting point of post-production. The earlier post-production operations and their development through time are going to be elucidated with a detailed approach. In advance of that, basic traditional post production process can be explained with this workflow:

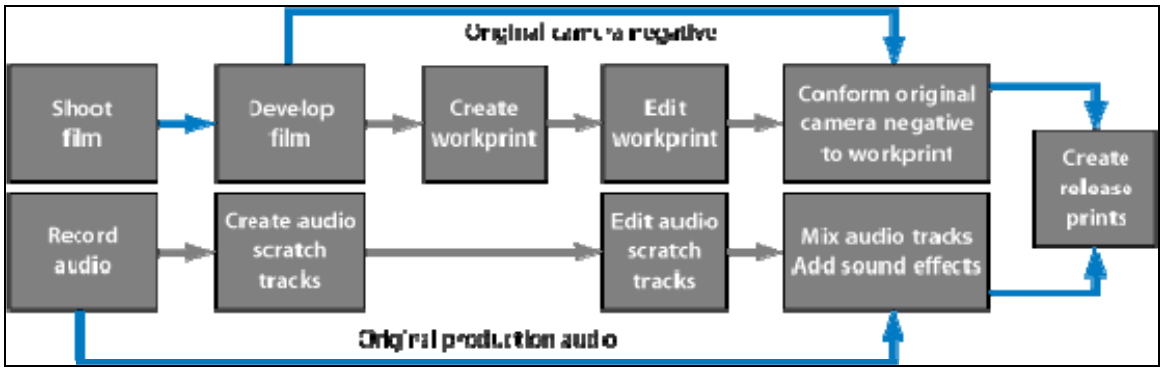

Figure 3.3 Basic Traditional Editing Workflow (Cinema Tools, 2011)

According to traditional editing workflow above, the first step is showing the shooting film and recording audio steps. Within the shooting process sound is recorded independently with a sound recorder. I have to add here that an important silent film period starting with Lumière Brothers. At these days post-production was not available. Usually a one angle, one shot was shown to audience as film. These are going to be mentioned in detail but afterwards, film cut technique was used but location audio recording was not available so music and writings were added for presentation of the story. Earlier the sound was available for recording as a mono sound. Afterwards stereo sound was available for recording. This is expressed as shooting dual system sound. As it is being described here generally, usually a microphone which is called boom is used to record sounds (Mamer, 2009). And that sounds goes to a recording device through a mixer. After the shooting, to use sound and picture together successfully, they must be synchronised. There are several methods to synchronize sound to the picture but usually a clapper board is used to have a

cue both audible and visible. For digital editing the step is same, film and sound is recorded separately. The difference is the recording equipment here. Below, there are pictures of contemporary and earlier film and sound recording systems.

Figure 3.4 Earlier Sound Recording Equipment. (Academy Award winning NagraIII + Sela mixer recorder) (Nagra Recorder, 2011)

Figure 3.5 Contemporary Sound Recording Technologies (Chicago Sound, 2011)

The second step is to develop the original camera negative. Original camera negative must be handled with care; it must not be contaminated or scratched. As it is shown at the scheme, at the end of the process this negative is going to be used for creating the final film. For the traditional editing process this negative is used to create a workprint which is film positive. And the original negative film is not used until conforming. If you are using a computer-aided digital non-linear editing system to perform the edit, then you will have to import, capture, or "digitize" all materials as media on your storage drives (Thompson & Bowen, 2009). In digital contemporary editing systems editors do not need a workprint as it is seen. Digitally captured media is non-linear edited instead. The scanning process of

original negative to the digital system is applied via telecine. And when it comes to output for an analog master print that is also a job conformed to telecine.

Figure 3.6 Charlie Chaplin With Earlier 35 mm Camera
(Kumar, 2011)

Figure 3.7 Standard 35 mm Film Camera (McKernan, 2005)

Conceptually, film scanners work much like desktop scanners. That is, a light is shined through each frame and the image captured and digitized onto an array, which translates the light into the computer bits and bytes needed to store and manipulate the image digitally. The devices currently in use for digitizing film can be divided into two categories:

Telecine and Film Scanner; both devices allow the film negative to be digitized, though there are considerable differences. A telecine device runs at real time without mechanical

pin registration and is generally designed to give real time interactivity while the film is loaded. Most of these designs are based on HD technology and are not able to scan the full resolution, dynamic range, and colour pallet available on the negative film. A true film scanner on the other hand is a stable high quality digitizer with no interactive controls generally scanning at slower rates allowing the film to be mechanically pin registered.

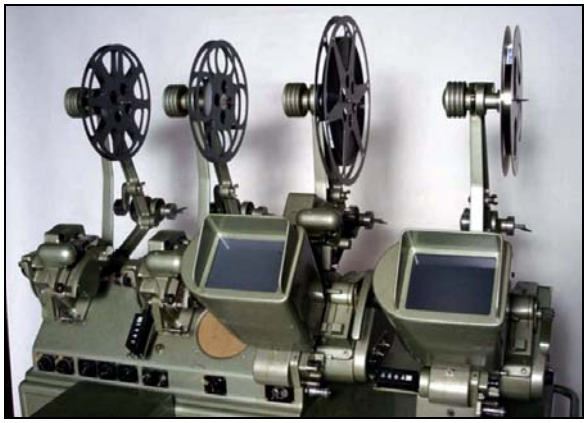

Figure 3.8 Moviola – The Machine that Workprint was Viewed and Cut.
(Video University, 2011)

Figure 3.9 Moviola Flatbed Machine for Cutting.
(Yasmin C Editing, 2010)

Workprints are the film positive shapes of the original camera negatives as it is mentioned before. These are the raw film footages for using at editing process which are also called cutting copy. Because they are film positives, they can be projected and can be used as dailies which are the unedited footages usually daily screened after shooting, for seeing what has been shot and what mistakes were made. In case of traditional editing system, editing is made using flatbed editing tables on workprints, on which the image is rear-

projected onto a small screen using a moving prism, and up to three magnetic soundtracks can be played in sync with the picture (Case, 2001).

Figure 3.10 Arriscan - An 16mm and 35mm Film Scanner. (McKernan, 2005: 91)

Workprints are the film positive shapes of the original camera negatives as it is mentioned before. These are the raw film footages for using at editing process which are also called cutting copy. Because they are film positives, they can be projected and can be used as dailies which are the unedited footages usually daily screened after shooting, for seeing what has been shot and what mistakes were made. In case of traditional editing system, editing is made using flatbed editing tables on workprints, on which the image is rear-projected onto a small screen using a moving prism, and up to three magnetic soundtracks can be played in sync with the picture (Case, 2001).

Creative filmmakers well understand the differences between the auditory and the visual, and how it can be used to great effect (McKernan, 2005). Simultaneously the workprint is being created, audio scratch tracks are prepared. Audio scratch tracks are similar to film workprints. In other words, they are the audio versions of these workprints. According to the mechanical film editor which is intended to be used, an audio scratch disk is created on magnetic film. This magnetic film also has perforations like regular film but it is coated with a magnetic material. But where the frames of pictures are in original film, this film has magnetic recording tape instead. There are types and names of this magnetic film as two stripes, three stripes, and mag stock. The audio scratch tracks are recorded and played on a machine which is called a dubber.

Figure 3.11 Two Stripes Audio Scratch Track
(Ginsel, 2008)

Figure 3.12 Reel to Reel Audio Tape Players (Scratch Track Dubber)
(HowStuffWorks, 2000)

For digital editing systems this process is different either. Most film sound is sent through a mixing board and not directly to the recording device. This allows for very subtle fine-tuning of sound, the way a large graphic EQ in a component stereo system allows one to get the "perfect" sound playback for different recordings. Most of the film sound engineers prefer to use DAT recorders which are the attribution for digital audio tape. These recorders were first developed by Sony in the early 1980s. Early 1990s The Philips DCC and Sony's MiniDisc, using digital audio data-reduction, are offered to consumers as record/play hardware and software (Audio Engineering Society, 1999). However, for film sound engineers, DAT recorders are still heavily in use. Digital audio workstations are now in use for digital editing system. These DATs are converted by digital-to-analog or analog-

to-digital (DA/AD) converters and edited in DAWs, Digital Audio Workstations, such as Pro Tools by AVID or Logic Pro by Apple.

In addition to recorded sound editing process, the music and the required dialogues are recorded. This is also a similar process for traditional film editing. Only the equipment and method is different. An edit copy of film is prepared for musicians and then the music is played and recorded according to the scenes of film. Also actors get involved to this phase with their dialogues. Afterwards all of these individual tracks, together with individual tracks of music, effects and dialogues are edited and mixed by a sound engineer. After the editing and mixing phase on software such as Pro Tools, these tracks are combined together and a bounce is created including all of these tracks.

Figure 3.13 Philips DAT Recorder (Philips DAT880, 2008)

Figure 3.14 Film Sound Engineer Working.
(Bright Shadow Films, 2010)

Starting to edit for film means making decisions on film footage about which parts is going to be on the film or which is not. At traditional editing system, each edit point is sliced and workprint is physically cut during this process. At this point changing ideas about the placement of a cut or trying another edit is a hard process on film. And also it is time-consuming of course. At this point digital editing techniques are now saving time and

making the process easier. When the editors and/or directors are sure about the edit which is made on workprint, it is negative cutters turn. Edit decision list (EDL) is finished and conforming phase starts. Edit decision list can be created in digital systems according to the timecodes or can be hand written on paper.

For digital editing process this phase occurs via computer. As it is mentioned before, analog material is captured to digital editing software as media files via scanning process. In addition, usually as there are different assistants for every phase of post-production for film, capturing analog to digital is also another assistant's or operator's work. Usually an operator captures the film to digital, then assistant editor makes the rough cut, and editor finishes the process with the fine cut of the film (Figure 3.15).

The visual editing process contains the cutting of unwanted parts of the film, correcting colour or / and exposure, combining scenes and creating transitions, applying visual effects and adding animations if there is, and creating titles and writings. Colour correction or colour timing is the process which operator or editor adjusts the colours of the film until reaches the desired look. In traditional colour timing, after adjusting editor had to wait for one day approximately to see the results, but in digital colour timing, this process can be performed realtime. Digital colour timing provides many additional options not available in traditional colour timing to enhance images, including image sharpening, defocusing, contrast adjustments, colour changes, and others.

Editor cannot totally decide which scene to seem how. He or she must use the script of the film as blueprints for constructions. The cuts and transitions have to give the emotion which is supposed to be. Of course editors are artists and each of them can add or different feelings to the film with their point of view. This is why usually producers and directors want to work with specific editors which they know how they work and procedure. The editing process may be repeated until the final expected shape is reached. During this process the edited media is revised by director and producer of the film, and if there are unused ideas of them, afterwards these are implemented by editor if it is possible. And hereby the fine cut is produced.

On the conforming step for traditional editing, the edited workprint is used as a pathfinder for editing the original camera negative. Cutting the original negative is a destructive process that cannot be undone. The cutting and splicing methods used with workprint are not the same in conforming phase. This actual cutting procedure destroys the frames at the

ends of each edit. Once the negative has been fine-cut, the only changes possible are to shorten or remove shots. Even this should be avoided, to minimize handling marks on the original negative (Case, 2001).

The audio which is transferred to what we called earlier as mag stock or magnetic film, is cut while the editor is editing the workprint simultaneously. Playing the dialogue track against a pos conform or a mute print of the cut negative will highlight any errors which can be adjusted before committing to the costly process of sound mixing. After the mixing process the sound track includes three tracks which are dialogues, music and effects (Purcell, 2007).

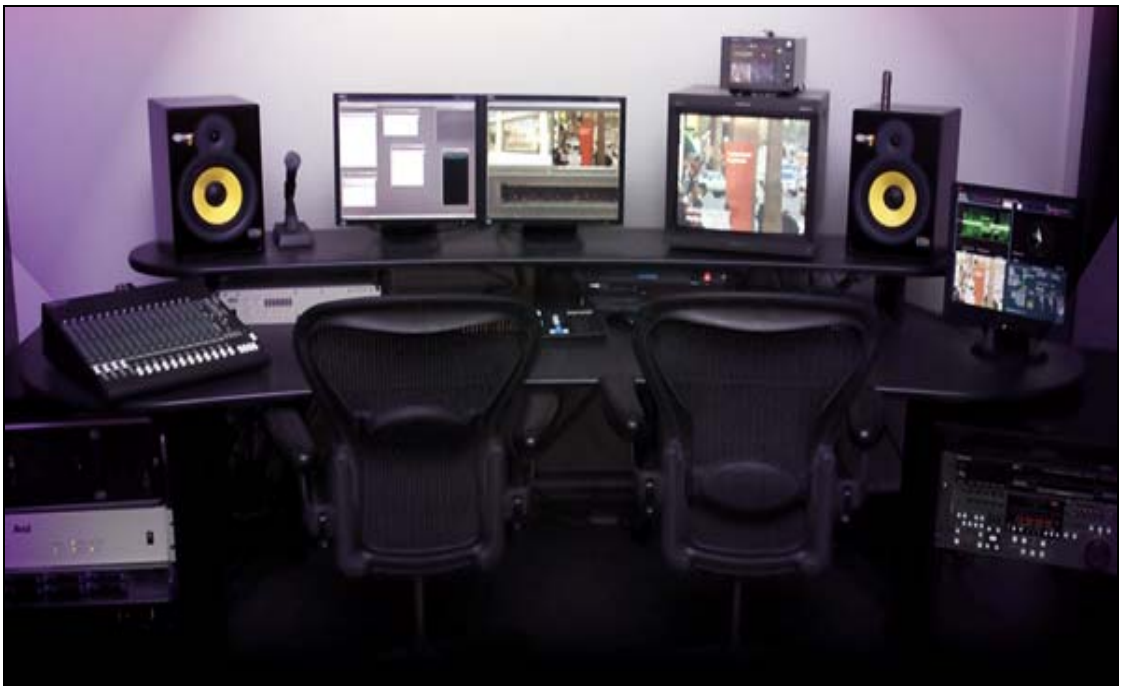

Figure 3.15 AVID Media Composer System, Non-Linear Editing Room Example. (Joshua Dixon Media, 2011)

After this phase, the magnetic film which is edited and mixed is transferred to an optical sound negative for the answer print and for distribution.

In digitalized audio editing as it is expressed the analog audio (DAT) is converted to digital editing system for editing. Following the edit process of the music, sound effects and dialogues these digital tracks are mixed and finalized and converted to the desired medium such as stereo or surround Dolby media. This means that tracks are ready for master print of the film.

After the original camera negative has been conformed and the audio finalized, the answer print can be created. Several answer prints can be created during deciding the best colour timing in traditional editing. The colour balance and exposure are adjusted for all shots to make sure all of them are similar to each other in simple terms. Once an acceptable answer print is achieved, it is used as the guide to make all subsequent prints, called release prints or master prints (Mamer, 2009).

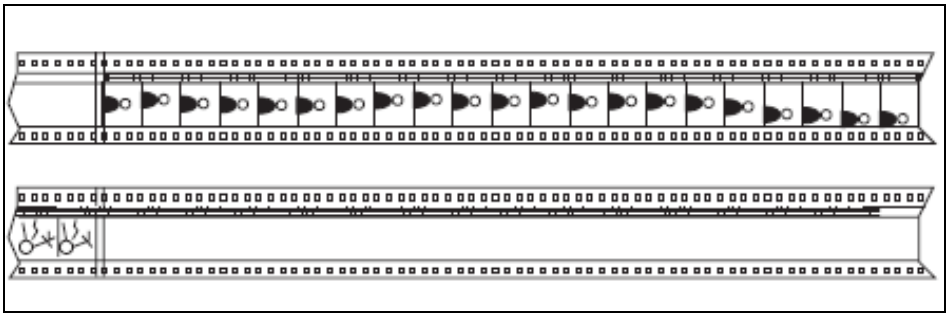

Figure 3.16 The Line above the Frames is Sound Track.
(Case, 2001)

For the release or in other words master print in digital editing system, the output can be produced as a film roll for projecting at theatres, as digital video or DVD preferably. Master film print is created by combining film with optical soundtrack. In some cases the music and effects are combined separately from the dialogue track. This is for creating a different language dialogue track for using at different countries. But this is preferred usually for TV productions.

As looking at the steps of editing processes above it can be said that the digital editing process is constantly evolving, however the basic structure of the process remains the same. The digital editing revolution has changed the effectiveness of the process. Every phase can be carried out in a faster way. And it must be accepted that earlier techniques are presented to users as digitized but with a wider range opportunities. For example traditional transition styles are limited but in digital system, there are several transition styles available for editors.

On the other hand the easiness of technology makes people addicted to computers and digital systems which the fingers are used more than whole body. Increasing of the comfort, time saving actions and new materials with more quality are really attractive for most of the people. In the mean time as we mentioned before, interactivity is gaining a more important role simultaneously with the improvement of technology. That can be said

that interactivity is the notion that creates the need for change and evolution. After briefly explaining the digital film editing procedure, the effects of interactivity on improvement of techniques is going to be evaluated according to post-production process.

3.2. Historical Evaluation of Techniques Depending on Examples from Cinema

The delicate and colourful Ice Age cave paintings (Figure 3.17) at Lascaux, France and Altamira, Spain attest to the innate human tendency for image making, which has played a vital role in the evolution and development of civilization (McKernan, 2005). Humanity is trying to express their feelings via images for a long time. As McKernan said the first known examples of this situation belongs to prehistoric ages which are mentioned before as the first known technological ages.

Among other things that can be said that these wall paintings were a starting point for pictographic communication which brings us to today's cultural position. These pictures, carvings were all carrying information within. With the advances of tool and techniques, humanity kept on finding new ways to express themselves. Alphabets, languages, these all came out from the need of expression. In other words, civilization's growth brought new branches of communication within itself.

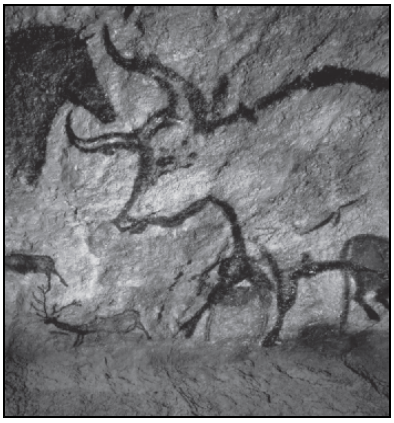

Figure 3.17 Replica of Lascaux's Ice Age Cave Paintings (McKernan, 2005).

3.2.1. Starting Point of the Post-Production Era, Silent Period of **Cinema**

At 1826 French scientist Joseph Nicéphore Niépce, took the first photograph (Figure 3.18) in the history with a technique called camera obscura which provides recording the image on a light-sensitive plane through a pinhole. Then he started to work with Louis Daugger to improve techniques and material for photography. As McKernan mentioned in his book (2005), early motion-image devices which were invented between 1832 and 1877 included Plateau's Phenakistiscope, Horner's Daedatelum, Desvignes' Zoetrope and Reynaud's Praxinoscope (Figure 3.19).

Figure 3.18 Niépce's the First Photograph (Feira, 2010)

Figure 3.19 Reynaud's Praxinoscope (McKernan, 2005)

The motion picture trials also came out from a need like creating an evolved imaging technique to express emotion and information more effectively. Simply stated, film is a

long ribbon of clear plastic, coated with photographic emulsion that is mechanically transported through a camera, where a shuttering mechanism exposes it to light, recording on the film a series of separate, sequential still images (McKernan, 2005). Thomas Edison wanted to invent a system that can record actions such as our eyes see. For this project Edison assigned his assistant Dickson. Dickson started to work on machines that can record motion pictures and also present them. Kinetograph and Kinetoscope (Figure 3.20) were invented respectively.

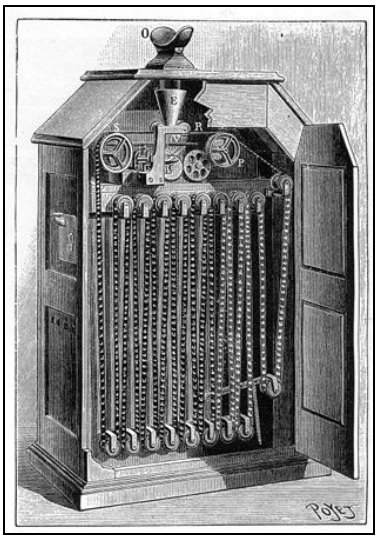

Figure 3.20 Edison's Kinetoscope (Feira, 2010)

In addition while creating Kinetograph, Dickson took advantage of Edison's earlier invention, a light bulb. Contemporarily thinking, from computers that are used for editing, to projections presenting the edited film, all have starting points, one of which is simply the invention of electricity. Computer was invented by someone else, but it is a very basic component which would not be excluded from the discovery process, was invention of electricity which belongs to Thomas Edison. At this point it can be said that technological improvements are based on adding new information to existing ones.

Edison and Dickson continued to develop their kinetoscope until their relationship broke. In France, meanwhile, brothers Auguste and Louis Lumière built a combination camera-projector and the first mass-produced movie cameras. This camera-projector is called Cinematographe which is derived partly from the Greek word for movement; it would later be shortened to cinema as an all-encompassing term for the art and technology of filmmaking and exhibition (McKernan, 2005).

Earliest films, including Lumière brothers' films, were less then a minute usually. They often did not have screenplays, the idea of watching a motion picture was already a complex story. The process of editing did not exist at these days. Editing was going to come out as a need of improvement for motion pictures afterwards. As it has been mentioned before, Lumière Brothers created the first motion picture example with the La Sortie de l'Usine Lumière (Workers Leaving the Lumière Factory, 1895). At 1895 the first special effect was used by Alfred Clark who was working for Edison Kinetoscope Factory. They used a substitution shot in "The Execution of Mary Queen of Scots" which means they stopped recording, all the other actors frozen and changed Mary Queen character with a doll to show as though the actor's head was executed and this technique became an effects standard.

In the earliest Auguste and Louis Lumière and Thomas Edison films, the camera recorded an event, an act, or an incident. Many of these early films were a single shot (Dancyger, 2011). And generally speaking, while taking these films these producers usually did not carry an intention to express an emotion. It can be affirmed that these first examples were a way to figure out how motion pictures work. And in between 30 years from the first examples, the motion picture and editing sector started developing. However these techniques were consisted of basic principles and some important notions such as continuity or dramatic emphasis through editing were not being held forefront.

In the case of Me´lie`s' films, it can be said that editing was minimal also. Although he used camera tricks like multiple exposure and stop-motion animation in his films. Me´lie`s combined different shots together and created a film which is 14 minutes length. This film was called "A Trip to the Moon" (1902, Figure 3.21).

Editor of a film and how this editor handles the subject creates a dramatic difference for that film. Editor adds his or her own point of view to the film at some point. This was mentioned earlier in basic editing workflows subject. This situation was not used as effectively as it is now at those earlier periods. The purposeful usage of editing started to become thus meaningful after Edwin S. Porter's work who was en earlier employee of Thomas Edison.

Figure 3.21 “A Trip to the Moon” (1902) by George Me´lie`s, Release Poster. (Wikipedia, 2011a)

Porter learned from Me´lie`s that the shots can be combined to create a story. But he enlarged that scope creating another important step. Porter, impressed by the length and quality of Me´lie`s’s work, discovered that the organization of shots in his films could make his screen stories seem more dynamic (Dancyger, 2011). He made a film named “The Life of an American Fireman” (1903). In this film he used an interior shot of a house with victims and firemen, an exterior shot of newsreel of real fire with firemen and a burning building. The film contains 20 shots and its length is 6 minutes. Porter’s decision to construct a story film from previously shot material was unprecedented Porter demonstrated that a single shot which is not recording an action completely is an important notion to construct the film and accordingly he presented the basic principle of editing (Reizs & Millar, 2010). Porter, in his “The Great Train Robbery” film presented a more accurate way of editing with dynamic shooting. There were 14 shots and the film was 12 minutes. Each and every shots of the film were shot at a different time and location. And any of a single shot showed an action from beginning to the end. There were time and location changes at shots but one action was created with different shots which were combined together. Also this film contains matte shots to composite two separate images, placing a shot of a train into the window of a station. The most significant feature of this short excerpt is its freedom of movement (Reizs & Millar, 2010).

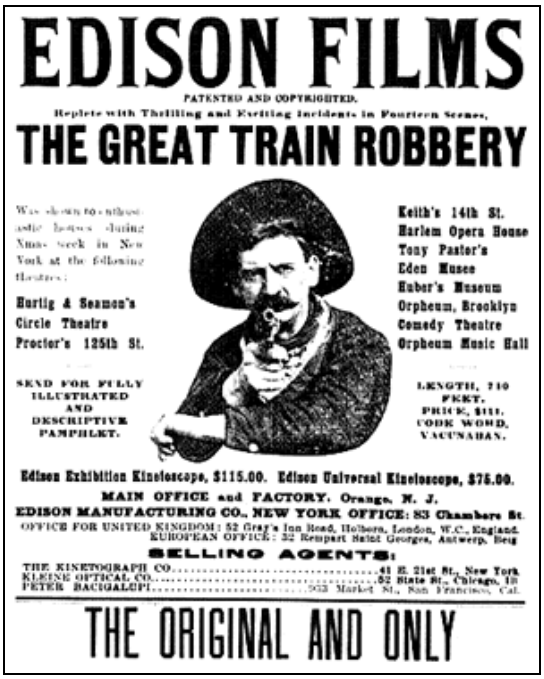

Figure 3.22 “The Great Train Robbery”, Edwin S. Porter
(Greatest Films, 2011a)

Edwin Porter directed a stop motion film which is named "The Teddy Bears" (1906). This film was averagely a minute but it took 56 hours to animate. After Porter’s “The Life of an American Fireman”, “The Great Train Robbery” and “Uncle Tom’s Cabin” films became successful, these films were started to be shared with audience. This was when nickelodeons became popular, and it was the first time that audience paid money for watching films. Nickelodeon age showed that filmmaking could be profitable sector. As the Nickelodeon Age blossomed and filmmaking and exhibition proved itself a profitable business, innovators such as D.W. Griffith, Charlie Chaplin, Carl Laemmle, Mack Sennett, and Cecil B. De Mille came upon the scene and creatively exploited the potential of cinematic storytelling (McKernan, 2005).

D.W. Griffith was known with the new breath he brought to editing, dramatic construction of films. He is known as the father of editing in modern understanding. In “The Greaser’s Gauntlet” (1908), Griffith attempted to move camera closer to the action, he experimented on his shots and cuts according to audience’s reactions. He tried match cutting in this film. The audience felt more inside the action with his this approach. Most of Griffith’s movements were depending on experiments. And most of these experiments are the basics of editing in post production at these days. Griffith demonstrated that a scene could be

fragmented into long shots, medium shots, and close shots to allow the audience to move gradually into the emotional heart of the scene (Dancyger, 2011).

In 1908 Griffit's innovations to editing were accepted as basics of editing by all other filmmakers. In his film "Emoch Arden" he tried a new way of cutting, parallel intercut. This parallel action brought a new idea that different shots can be ordered in a different way to create a dramatic intention. Griffit's experiments can be understood as he wanted to know how far he could go with the material in his hands. By splitting an event into short fragments and recording each from the most suitable camera position, he could vary the emphasis from shot to shot and thereby control the dramatic intensity of the events as the story progressed (Reizs & Millar, 2010). At this period, "The Birth of a Nation" (1915) was one of his films which created a tremendous impression. This film had a length of more then two hours. This film was originally a 12 reel film with 1544 separate shots. On the other hand, Sergei Eisenstein expressed that Griffit's all intention on these device discoveries such as cross-cutting, close shots, flashbacks, even dissolves, was to find them (Reizs & Millar, 2010). Eisenstein was a Russian director, writer and editor who wrote "Montage of Attractions" (1923) as a theorist. Some of the people from industry call him as the father of montage. His theory of editing has five components: metric montage, rhythmic montage, tonal montage, overtonal montage, and intellectual montage (Dancyger, 2011).

In 1910s an important special effects was introduced. Filmmakers were using a painted glass matte as a background instead of building set completely for the shots. Later on these backgrounds were used to combine two different shots together. This technique is similar to today's greenbox technology. At 1920 major U.S. and European film studios created special effects departments. Also hanging miniatures of decors were used which was helpful for reducing the costs.

By the 1920s, motion picture industry became a huge sector and new theatres for films started to be constructed. At these times the sector started to move to west, Hollywood, the place that is known as the heart of the contemporary industry. Simultaneously the technological improvement of equipments of industry continued its development. At the end of the decade, sound production for films was an available option.

In conclusion, as a result of filmmakers' discoveries, in an averagely 30 years of time period, the photography became motion picture.

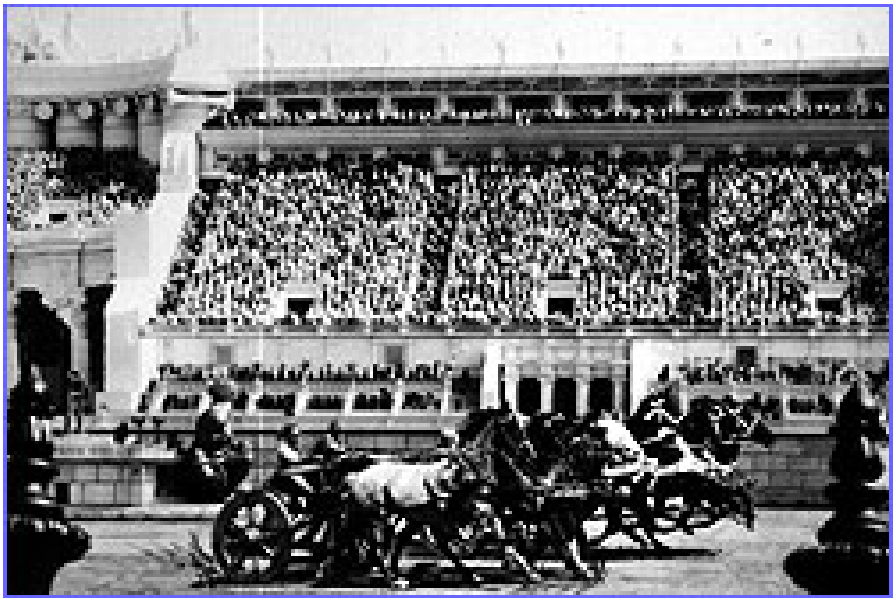

Figure 3.23 Ben-Hur (1925), Hanging Miniature of Coliseum.
(Nova Online, 2000b)

Figure 3.24 Glass Matte Background for “Dancer of the Nile”
(Nova Online, 2000b)

All of these filmmakers were affected by each other. Improvement of motion picture technology was similar to all the other improvements that belong to different sectors. Drawing was already being used to record images, and then photography came out from the need of reality for these pictures. Afterwards, recording an image as a captured moment, photograph was discovered, that followed the need to see that steady picture

animated as a person sees fluently with eyes. The starting point of a new invention depends on an earlier one. This was in this manner before, it is now and it is going to be in the future.

3.2.2. Evolution of Techniques of Cinema Post-Production with Sound Production

The first film made with sound was Warner Brothers' "Jass Singer" (1927) film. At those days Warner Brothers were using a system called Vitaphone which was a sound on disc system. Warner's disc-based Vitaphone system was overtaken by electrical engineer Lee De Forest's competing inventions: the printing of an optical variable-density stripe directly on the film that "married" sound and picture and maintained synchronization, and the Audion vacuum tube to amplify sound in theatres (McKernan, 2005). Afterwards, The Fox Corporation invested in a new system which is a sound-on-film system, Movietone. At last Photophone became the industry standard which is an optical system produced by RCA. These discoveries on sound systems actually came with the invention of telephone and radio.

Of course invention of sound recording for film was not the end of problems related to audio usage. There were related technical issues such as quality of microphones, synchronization of camera and sound, and sound amplification. Filmmakers learnt new techniques and engineers saw what was needed to develop these techniques by using these inventions. Microphones had to be directional because of the ambient noise. Ambient noise which is the sound that location includes should not drown the music and the dialogues. Image and sound recording should be in such synchronization so when they were both played the image fit to the sound. Amplification was important because the films were going to be played at big theatres and the sound should be clear enough. And another problem was that the microphones had to be kept static during the shooting, so the cameras could not be moved because of sound recording. This made the dramatic effect of the usage of camera movements and close-ups to stay at the background. However, special effects were considered to add a dynamic feeling to the films. At 1933 King Kong was shot with special effects such as stop motion animation, rear projection, miniatures, and optical compositing combine actors, miniatures and puppets. The preparation process of stop

motion animation of prehistoric creatures took 55 weeks. For this production director Merian C. Cooper and animator Willis O'Brien worked together.

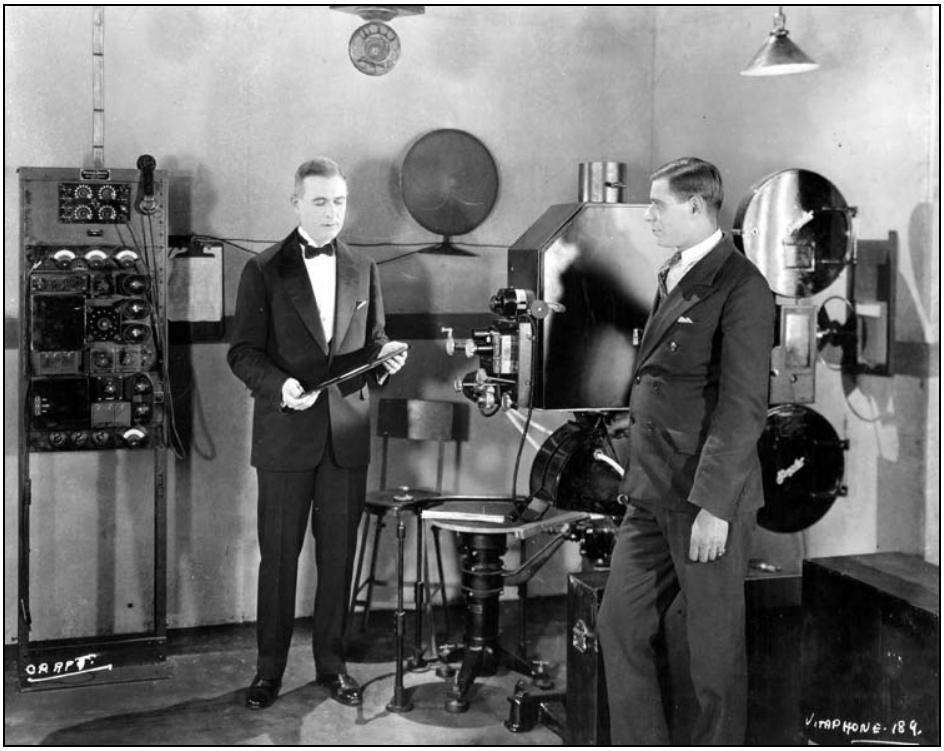

Figure 3.25 Vitaphone, Sound on Disk System (Wikipedia, 2011b)

At the editing process the sound on disk or film could not be cut in total synchronization with image. Later on, filmmakers started to use multiple cameras and re-recording the sound was an available option, these made the process easier. When sound first started to be used in films, the editing process of image had to take second place. Before that as it is told filmmakers were trying to improve their creativity on image editing. The history of silent film-making is the history of the struggle to widen the cinema's visual appeal through more and more elaborate editing (Reizs & Millar, 2010).

After sound recording was available the shape of the film industry began to change. There was sound at films after all so voice quality of actors were important, the dialogues were important, and sound needed to be edited, that situation brought new challenges and branches of work for motion picture industry. In addition at the earliest films director and editor and writer usually were the same person. With the development at the motion picture industry, with the addition of sound editing and special effects filmmaking became a bigger responsibility and a distribution of tasks became compulsory.

Figure 3.26 Photophone, Sound on Film System (Grahame, 2011)

The silent speed of film was 16 frames per seconds, with the technological improvements related to sound the speed to run the film and sound became 24 frames per seconds. To prevent the action from the camera noise, sound proofed boxes which are called ice boxes were used. In 1929 camera blimps were invented and camera became lighter so carrying the camera became much easier. This situation provided the visual creativity to become available again. On the other hand using the sound with film gave the films a more realistic position. This situation caused some of the editing and shooting techniques such as Griffit's techniques not to be used anymore. Because the impression attempted to be given with these silent film techniques were available to be given with sound already.

Figure 3.27 "King Kong" (1933)
(3B Theater Poster Archive, 2011)

In sound films this freedom to rearrange and experiment with the material in the cutting room has been considerably reduced: partly because synchronised sound "anchors" the visuals; partly because production costs of sound shooting are so high that it is normally impractical to shoot a large amount of footage which may not in the end be used (Reizs & Millar, 2010). A very important example for this period is Alfred Hitchcock's "Blackmail" (1929) (Figure 3.28). Hitchcock shot this film as both silent and sound film; they were also named as talkies at those years. The silent parts had sound effects and music. Hitchcock did not allow sound to be dominant on his film and that was also a characteristic of early sound films. He tried to mix sound and picture together to express the emotion he wanted. In other words, he took advantage from the use of sound but did not let the sound to come to the fore. But on the other hand as we can see from the poster of that film, the use of sound was presented to the audience with excitement.

As mentioned before, the sound and picture editing machine Moviola provided to edit sound and picture simultaneously in synchronization. This machine was invented at 1930. By 1933 microphone technology was improved and mixing was available for sound editing. Mixing helped music and dialogues to be used simultaneously without earlier

problems. After that in 1936 optical sound tracks, which were mentioned before, were developed and in 1939 with the improvement of unidirectional microphones, the total sound quality was enhanced. After 1945 filmmakers started to use magnetic film for sound editing. At 1939 also the first Academy Award for Achievement in Special Effects is awarded to "The Rains Came," featuring a masterminded by Fred Sersen who has worked at 20th Century Fox for a long time (Figure 3.29). Alfred Hitchcock directed his second Hollywood feature at 1940, "Foreign Correspondent."

As known as a master of special effects, Hitchcock used rear projection to bring exotic places into the studio. For "Foreign Correspondent," Hitchcock and Lee Zavitz created a scene of a plane crashing into the ocean by using a rear projection of the ocean; when the plain crashed, thousands of gallons of water were poured through the screen.

At 1945 Willis O'Brien directed another stop-motion animation named "Mighty Joe Young" which was assisted by animator Ray Harryhausen. Harryhausen worked on the production of more than 20 films, including "The Beast From 20,000 Fathoms", "Earth Vs. The Flying Saucers," "Jason and the Argonauts," and "Sinbad and the Eye of the Tiger." By 1991 Harryhausen was awarded the Gordon E. Sawyer Award from the Academy of Motion Picture Arts and Sciences for his technological contributions.

Figure 3.28 The Poster of Alfred Hitchcock's "Blackmail" (Dancyger, 2011)

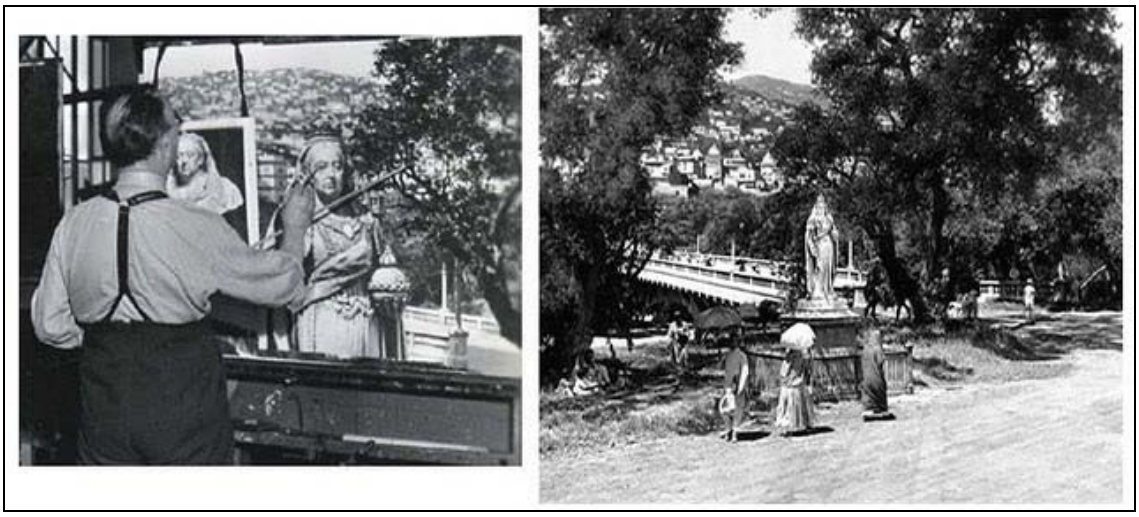

Figure 3.29 Matte Painting for “The Rains Came” (1939)
(Matte Shot, 2011)

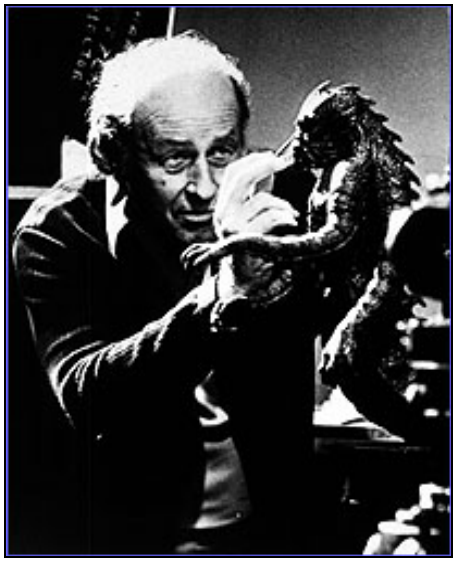

Figure 3.30 Ray Harryhausen Working for a Stop Motion Animation
(Nova Online, 2000b)

One of the most important developments for the motion picture industry was producing colour films. First attempt was “Kinemacolor”. This process was developed by an English inventor George Albert Smith in 1906. Afterwards Leon Douglass developed a colour process and produced amazing colour travelogues, as well as a feature-length colour film, “Cupid Angling” in 1918. His process became one of the factors in the formation of the

Technicolor Motion Picture Corporation, which came to dominate the industry in the 1930s and '40s (Museum of American Heritage, 2001)

The Technicolor procedure was established with a specific camera which simultaneously splits and records the image through green, blue and red filters on three strips of black and white film (Figure 3.31). After a special printing process the developed strips were transformed the colour prints of the film. Between 1932 and 1952 the colour motion picture procedure belonged to Technicolor (Figure 3.32). Then Kodak's Eastman Color process emerged and while the 112 of the films which were made in 1955 belonged to Eastman Color, Technicolor only had 90 of them. Kodak's Eastman Color is widely used today also. Generally films are made with Eastman Color negative but printed in Technicolor laboratories. The first film which is made with Technicolor is "The Gulf Between" (1917). First all-colour "talkie" film is Warner Brothers' "On With the Show" (1929). First feature film made entirely in 3-color Technicolor is Rouben Mamoulian's "Becky Sharp" (1935). First film made with using Kodak's Eastman Color process was "Royal Journey" (1952).

Figure 3.31 3 Strips Technicolor Camera Example
(Wikipedia, 2008)

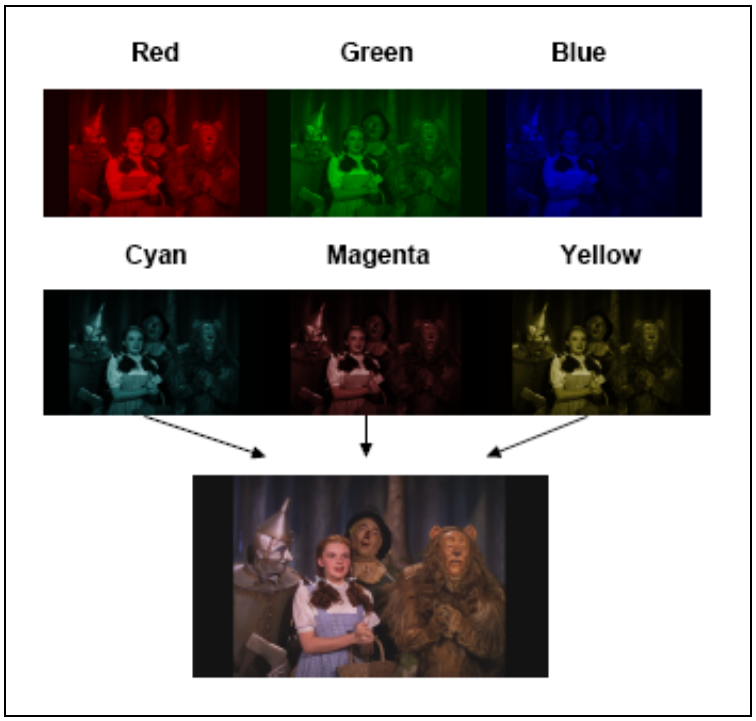

Figure 3.32 One of the Important Technicolor Films, "The Wizard of Oz" (Macdonald, 2006)

In the mean time, between 1945 and 1950, the use of magnetic recording over optical improved quality and permitted greater editing flexibility for sound. Magnetic film began to replace optical film for sound editing. Larger film formats, such as Cinemascope and TODD-AO, provided space on film for more than one optical track. Stored sound offered greater sound directionality and the sense of being surrounded by sound.

In addition the production of 16 mm film has to be mentioned to express its contribution to sound film period, which was also going to start the Cinema Verite movement. With Cinema Verite movement, the special effects reduced because the movement's most important property was reality as it is going to be mentioned later. 16 mm film was introduced to sector by Kodak at 1923 as a silent film format. Cinema industry accepted this format of film as a sub standard film. It was more accurately used amateurishly because it was inexpensive. However 16 mm film became popular in film industry when at 1935 optical sound track was added to it. Also 16 mm film was the first nitrate-free film type, it was acetate based. Afterwards, 35 mm nitrate was discontinued by Kodak in 1950s. The usage easiness of 16 mm film started the "Cinema Verite" cinema period. Most important characteristics of this period are poor image, poor sound and poor light. These

films gave the audience a sense of intimacy because they were not as magnificence as cinemascope films.

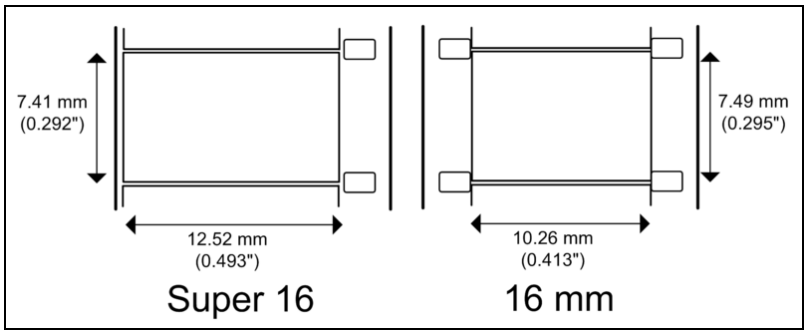

Figure 3.33 Standard 16 mm and Super 16 mm Film Formats.
(Wikipedia, 2009)

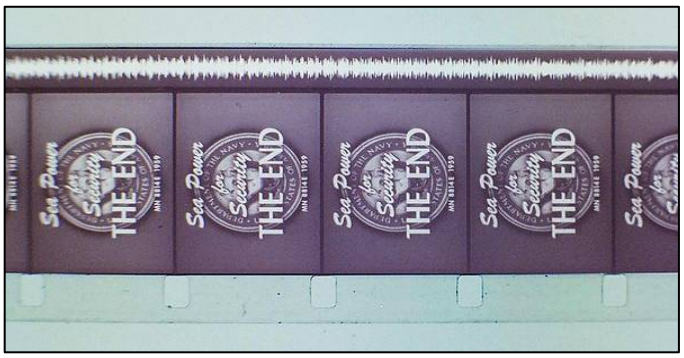

Figure 3.34 16 mm with Sound Track
(Wikipedia, 2010b)

And the storage of the film stocks, the easy to carry equipment and realistic and simple editing made this kind of documentary filmmaking attractive. The Italian neorealist filmmakers—such as Roberto Rossellini (Open City, 1946), Vittorio DeSica (The Bicycle Thief, 1948), and Luchino Visconti (La Terra Trema, 1947)—were the leading influences of the movement (Dancyger, 2011).

In the mean time, cinemascope technology was developed. Before cinemascope, the filmmakers developed several different ideas to widen the picture and sound quality. As early as 1927, Abel Gance used a triptych approach (Figure 3.36), filming particular sequences in his "Napoleon" (1927) with three cameras and later projecting the images simultaneously (Dancyger, 2011).

The idea of the triptych format could not take the attention of filmmakers. The idea of wider screen was a good point but production and post-production phases would be

extremely difficult. In case a camera moves or one of them gets a close-up. And also this approach would limit the usage of picture editing techniques.

Figure 3.35 "Open City" (1946) (Roberto Rossellini)
(Mondo 70, 2010)

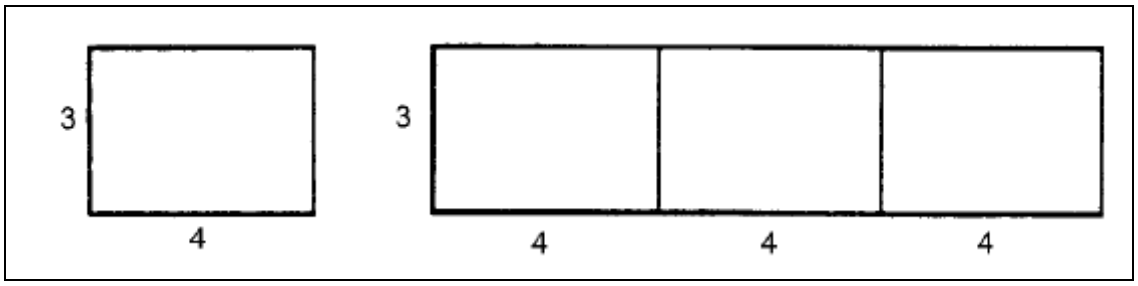

Figure 3.36 Academy Aspect Ratio and Triptych Format (Dancyger, 2011)

The widescreen technology was discovered by French professor Henry Chretien already by 1927. His method was to compress a wide picture, by means of an anamorphic lens, on to normal 35 mm film stock and to enlarge it once more in projection by use of a compensating lens (Reizs & Millar, 2010). This technology did not take attention these days. But after World War II, with the development of television and its effects on motion pictures, filmmakers were into a new improvement to take audience back to their attention. Cinemascope was first used by 20th Century Fox. Its width and clarity make it possible to unfold a scene of great complexity and length without losing sight of detail or overall shape, meanwhile preserving the intensity which is dissipated by cuts which are only

mechanically necessary (Reizs & Millar, 2010). And the first cinemascope film was "The Robe" (1953). The other notable widescreen process of the period was VistaVision, Paramount Pictures's response to Cinemascope (Dancyger, 2011). The basic 35 mm film was used horizontally in this procedure and this brought a sharper image quality and stronger sound. Paramount introduced a wide screen ratio of 1:1.85.

Wide screen technology brought editing problems within. Because of the anamorphic lens, at the close-ups image was distorted. Or because of the field of depth of the lens, moving shots were harder. These problems are all seen by filmmakers and audiences in the film "The Robe" (Figure 3.37) was the first cinemascope film.

In the mean time, while film technology was improving, another imaging branch came to agenda, television. And whereas film was based on mechanics and photochemical media, television has been—for the most part—purely electronic (McKernan, 2005). There are several scientists that are known for working on the invention of television but naming the actual inventor of television is hardly possible. It can officially be said that German inventor Paul Nipkow applied for the patent of television in 1884. This invention required an electronic camera which shoots electronic video, and that was found by John logie Baird in 1925. However, like all the other technological developments, motion picture industry was at a standstill because of World War II.

At 1950s filmmakers tried to use electronic video tapes for filmmaking but this attempt was not actually successful. When used in theatre screens, the resolution of the television media was not big enough. Video frames consist of 576 lines (PAL) or 487 lines (NTSC) from top to bottom; 35 mm negative can resolve at more than 3000 lines vertically (Case, 2001). At first actually television used 16 mm gauge films which are easier to carry and less in expense according to 35 mm gauges. Then electronic video tapes were preferred for television. Videotape turned editing into a linear process. Film, as a physical medium, is inherently "nonlinear," which means that the editor can cut any number of frames from one part of the roll and insert it anywhere else in the film—over and over again, without penalty (McKernan, 2005).

When electronic film production was introduced with video tapes, there was a thought that film would fall from favour. Actually attendance to the movies reduced while television was gaining popularity. Filmmakers tried new techniques to gain the attention of audience

such as effects-laden spectacles and larger-than-life film formats like Cinemascope, Todd-AO, VistaVision, and 3-D.

Figure 3.37 “The Robe” (1953) (Henry Koster)
(Wikipedia, 2010a)

The ability to watch entertaining television programmes on television at home made people find unnecessary to go to cinema. By 1960s television started to broadcast motion pictures also. These period changed lots of things for cinema. Emerge of the television affected film editing in a realistic way. Because when people watched news from television they actually felt it was being broadcasted immediately. So audience got used to the idea when a film looks like television news, it was realistic. In the feature film, this style began to have an influence as early as John Frankenheimer’s “The Manchurian Candidate” (1962) and was continued in his later films, “Seven Days in May” (1964) and “Black Sunday” (1977) (Dancyger, 2011).

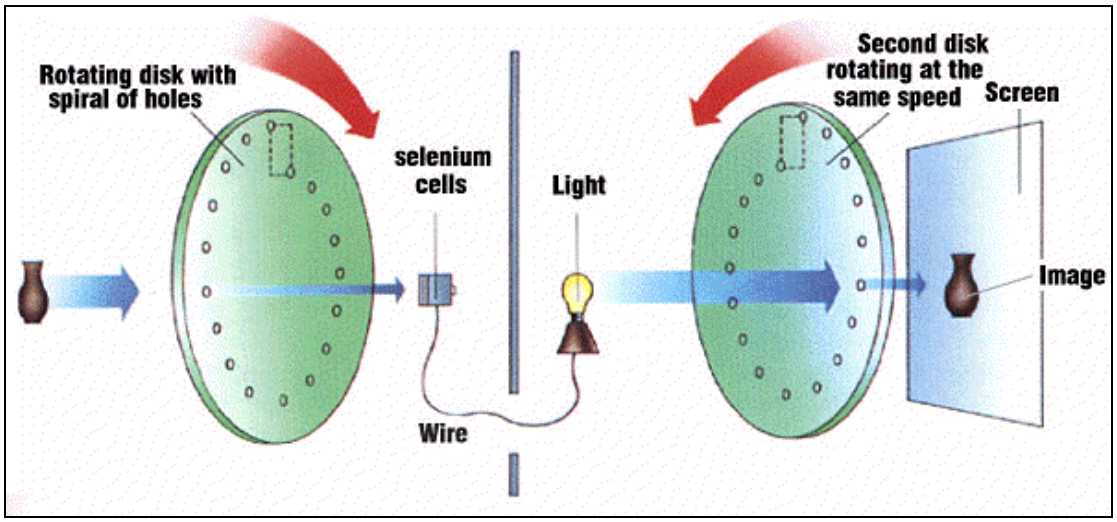

Figure 3.38 Paul Nipkow's Mechanical Television System
(Naughton, 2011)

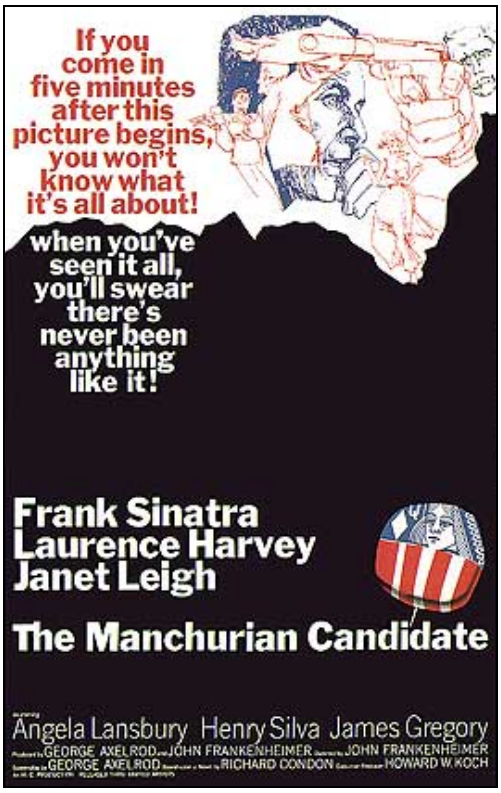

Figure 3.39 "The Manchurian Candidate" (1962) (John Frankenheimer)
(Greatest Films, 2011b)

Given that the subject, character, or event already has a public profile, the filmmaker need only dip back into that broadcast-created impression by using techniques that allude to veracity to make the film seem real (Dancyger, 2011).

Meanwhile, George Pal produced "Destination Moon" (1950) which was a story on lunar travel that got awarded with the Oscar for effects and ushers in a decade of science fiction features with high-profile special effects (Nova Online, 2000a). Gorge Pal later on awarded with Oscar for his other movies which were "When Worlds Collide" (1951) and "War of the Worlds" (1953).

By 1956 Cecil B. DeMille shot an earlier 1923 dated film of his "The Ten Commandments" for the second time. This time he used special effects involving a blue-screen for actor Charlton Heston, miniatures, pyrotechnics, 600 extras, matte paintings, and a 32-foot high dam channelling tens of thousands of gallons of water. It is known that the timing for this film was about two and a half years and $2 million was expended. This cost was the most expensive special effect for that moment.

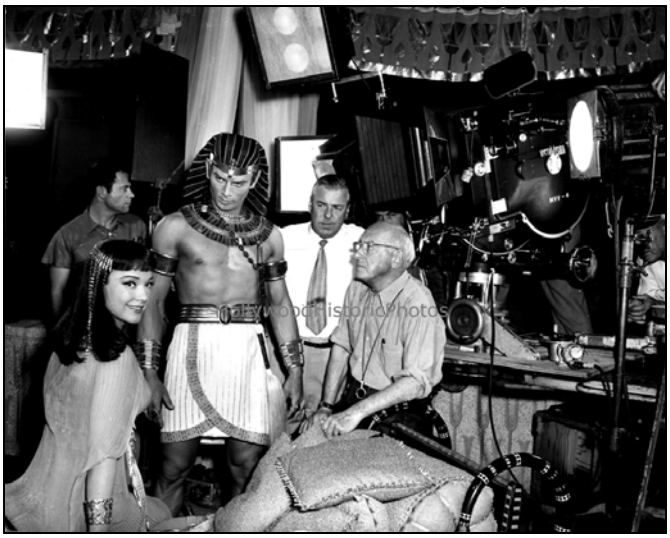

Figure 3.40 Cecil B. DeMille, on The Set of “The Ten Commandments” (1956)
(Hollywood Historic Photos, 2012)

At 1968 Stanley Kubrick’s “2001: A Space Odyssey” was shot which created a tremendous impression on audience. Including an early form of motion control and the slit-scan technique this film set a new standard for special effects. By the late 1960s, computer-generated animations of pulsating patterns by such artists as Mark, Michael, and John Whitney Jr., and Kenneth Knowlton pointed the way toward a new kind of “expanded cinema.”(McKernan, 2005)

By the late 1980s, thanks to new technology and a turnaround in the financial decline of the industry, almost all major titles by that time were being released with wide-range

multichannel stereo soundtracks, as is the case today. That breakthrough development was by Dolby Laboratories of a highly practical 35 mm stereo optical release print format originally identified as Dolby Stereo. In the space allotted to the conventional mono optical soundtrack is developed into two soundtracks that not only carry left and right information as in home stereo sound, but are also encoded with a third centerscreen channel and a fourth surround channel for ambient sound and special effects. As a result, stereo optical prints could be reproduced in cinemas installing Dolby cinema processors with far wider frequency response and much lower distortion than conventional soundtracks. The result was multichannel capability equalling that of four-track magnetic 35 mm which soon became obsolete, with consistently higher fidelity, greater reliability, and far lower cost.

The newest Dolby format, Dolby Digital Surround EX, was introduced in 1999, and adds a third surround channel to the Dolby Digital format. Admittedly, the results can vary but Dolby film sound at its best means not only better sound quality, but sound in the theatre that consistently realizes the director's original intentions. Dolby Laboratories' involvement with film sound first achieved wide recognition with the spectacular audio effects of such films as "Star Wars" (1977).

3.2.3. Contemporary Techniques of Post-Production, Digital Cinema Era

It's hard to say exactly when the digital cinema revolution began in earnest, but George Lucas' 1996 letter to Sony's research centre in Atsugi, Japan probably provides the best historical starting point (Mamer, 2009).

George Lucas, who is a writer, director, editor and producer, is an important person for motion pictures industry with his contributions to digital cinema revolution. He was always searching for a new innovation for cinema. With his 1977 release dated "Star Wars" he used Dykstraflex motion controlled camera which was a development of John Dykstra. Afterwards this camera was going to be used for most productions at industry. The film, "Star Wars" was awarded with 6 Oscars and one of them was special effects Oscar Dykstra got.

Figure 3.41 “Star Wars” (1977)
(Thomas, 2011)

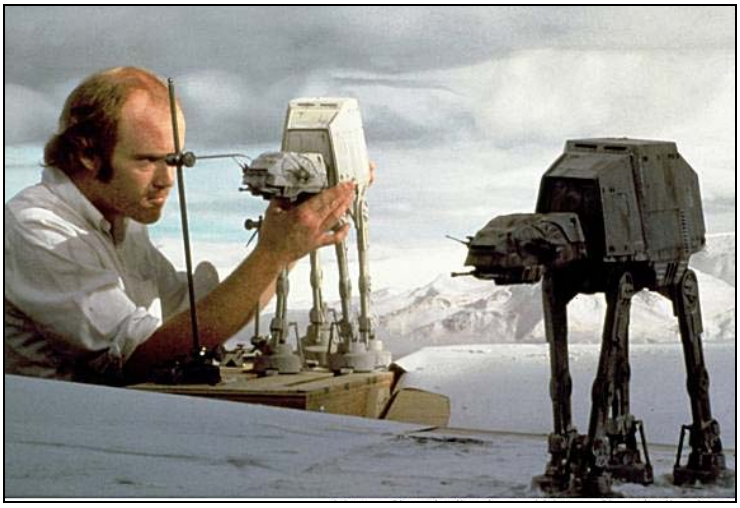

Figure 3.42 “Star Wars” (1977)
(Thomas, 2011)

With the benefits of this film, Lukas kept on improving new techniques and he came up with innovations. One of the first non-linear editing systems was EditRoid which is a LucasFilm innovation. In the mean time computer graphics were developing simultaneously and Gorge Lucas formed a department called Computer Development Division by 1980, which later on is going to be Pixar. Actually there were other companies working on computer graphics but most of them were working for television broadcasts. At 1982 Walt Disney Pictures released the film “Tron” which is another milestone in computerized film making.

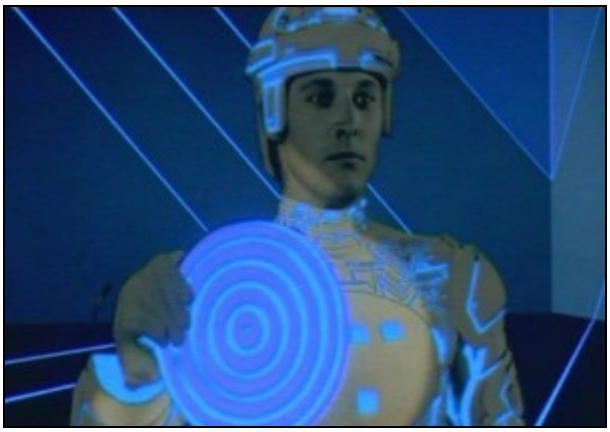

Figure 3.43 A Scene from The Film "Tron" (1982).
(Johnson, 2010)

More than fifteen minutes of this film was created with computer graphics and camera shots were edited with computer graphics also. This film's success was not much exciting but it was an important step to show how a new look was possible with computer graphics. The graphics of the film was transferred through picture tube to movie film, producers worked with Constantine Engineering Laboratories Company (CELCO), which had been making special cameras for NASA and the defence community. CELCO worked on transferring digital satellite image data to large photographic prints. "The Last Starfighter" (1984) and "Young Sherlock Holmes" (1985) were also films which were made with computer graphics.

> "CG animated movies has proven to be very profitable. One of the best known American computer animation studios. Pixar. exemplifies the profitability clearly with its extraordinary fiscal records. On average, each of Pixar's six productions has raked in $240 million at the domestic box office. $285 million internationally, and an astounding gross profit of $450 million". (Sütçü & Yılmaz, 2007)

In the mid 1980s, editing manufacturers had already begun to experiment with creating new editing systems that could return the advantages of "nonlinear" editing to video. Tape-based, optical-based, and hybrid systems appeared in the market as pioneering systems from Montage, Ediflex, CMX, and—from George Lucas' R&D lab—EditDroid (McKernan, 2005). Non-linear editing systems were welcomed very nice in theory at first, because in practice the process of getting used to it was a time consuming period. Lucas' EditRoid was a starting point for AVID's Media Composer.

Figure 3.44 A Scene from “The Last Starfighter” (1984)
(Sciflicks, 1984)

Filmmakers did not get used to the idea first but at 1990s digital non linear editing and as a brand AVID were the industry standard for editing. Also Pro Tools by AVID's Technical Grammy awarded DAW is now generally preferred software for non-linear editing process. Afterwards Sony made an attempt to create the video cameras which were high definition for cinema. With HD recording technologies of Sony, Lucas and Sony together created the starting point of the digital age of cinema. Sony became the new “Kodak”. The problem was that, video cameras were for broadcasting even they are HD and because of that their shooting format was 30 frames interlaced and cinema’s was 24 frames per second and progressive. The letter Lucas wrote to Sony company was about this problem. He asked Sony to create a camera which records, stores and playbacks the high definition images in 24 frames progressive format. Sony rose to Lucas’ challenge and brought forth its CineAlta format, which recorded 24-frame progressive-scanned digital HD video (McKernan, 2005).

Figure 3.45 Interlaced Scan Problem
(Windows Movie Makers, 2011)

At 1995 "Toy Story," the first entirely CG feature-length film, was released. The filmmaking process was about four years, the film length was 77 minutes, and contained 1000 gigabytes of data which the render time interval was 800000 hours.

Figure 3.46 Behind The Scenes of “Toy Story”
(Flickr - Photo Sharing, 2011)

At 1997 "Titanic" was released which was a James Cameron film and received 10 Oscars, including Achievement in Visual Effects. With more than 450 effects shots were created by Digital Domain and 16 other companies, it became the highest-grossing film of all time worldwide.

Figure 3.47 Baja Studios, The Set-up Created for “Titanic”.
(Muttalib, 2007)

At the beginning of the 2000s the non linear editing process was shaped as expressed before as contemporary editing process. From the beginning, these digital nonlinear editing systems offered more than just editing. Their inventors realized that the digital environment made it possible for several tools to be offered as software within the same box. Character generation, video “paint” graphics, and audio mixing made their way into some of the very first nonlinear editing systems (McKernan, 2005). Companies are still working on pushing the limits for the better, in relation with the general improvements of technology. 3-D films have existed since the 1950s, but had been largely relegated to a niche in the motion picture industry because of the costly hardware and processes required to produce and display a 3-D film, and the lack of a standardized format for all segments of the entertainment business. Nonetheless, 3-D films were prominently featured in the 1950s in American cinema, and later experienced a worldwide resurgence in the 1980s and '90s driven by IMAX high-end theatres and Disney themed-venues. Last but not least as an important example for contemporary techniques James Cameron’s latest film should be mentioned. This film has highly used computer graphics and also a three dimensional film.

Figure 3.48 “Avatar” (2009) Behind The Scenes.
(Pendlebury, 2010)

Figure 3.49 “Avatar” (2009) Behind The Scenes.
(Pendlebury, 2010)

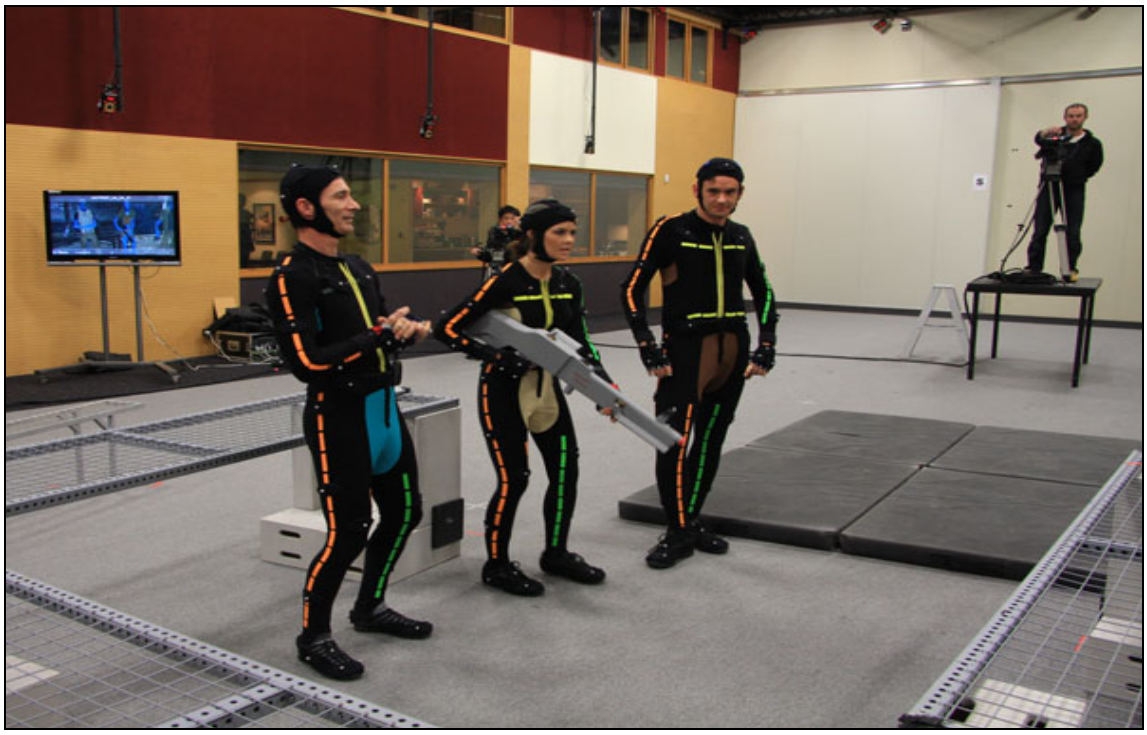

Figure 3.50 “Avatar” (2009) Behind The Scenes.
(Pendlebury, 2010)

Figure 3.51 “Avatar” (2009) Behind The Scenes.
(Pendlebury, 2010)

4. ANALYZING the EFFECTS of TECHNOLOGICAL IMPROVEMENTS on POST-PRODUCTION AREA in CINEMA SECTOR ACCORDING to USER INTERVIEWS

"The practice of putting together a media object from already existing and commercially distributed media elements already existed with old media, but new media technology further standardizes it and makes it much easier to perform. What before involved scissors and glue now involves simply clicking on cut and paste." (Manovich, 2002: 125)

In today's environment, as expressed before, there are several ways for reaching a film. People can watch the same film at cinema, by computer or by DVD players or do all of these preferably. A large number of people are waiting the official DVDs to be released instead of going to cinema. On the other hand, there are several people who cannot underestimate the image and sound quality of watching a film at cinema. However internet is a powerful source today, the release date of a DVD is now the same day that film is available for free downloads via torrent files through internet. Even before that DVD release date, some of the people are recording these films with their personal amateur cameras at cinemas and share this as a copy of that film with a lower sound and image quality but these have a range of downloader as well. Even 3-D films are available for watching at home because of 3-D TV innovations. This is surely going to be followed by similar innovations. However large numbers of people still prefer to go theaters to see a film that is because cinema became a product of popular culture also. Going to cinema is a habbit, is a date with friends. On the other hand this is not changing the fact that lots of things changed in the process of film making.

Technology is the norm that brought the situation to this aspect, films to be easy to reach for audience. On the other hand technology again is the norm which brought the film making process to today's aspect also. None of the earliest film makers such as Griffith could imagine today's film making, editing and presenting technology. He would have thought himself dreaming while watching James Cameron's "Avatar" because expectations of his era were not even close, he could not imagine at all.

Technological improvements not only became the reason for reshape for cinema or audience, most of the entities of most concepts had a share from this evolution. The major consequence of this evolution can be considered as interactivity. Interactivity and new media norms have been adverted to in previous parts of this thesis.

In this part of this thesis the approach is going to be analyzing the the effects of the improvement of technology at post-production area of cinema. To accomplish that, 15 people who work on the post-production field have been interviewed and their answers are going to be evaluated.

The questions asked to these groups of users are as follows:

(Hereby non linear digital film and sound editing techniques are taken as contemporary, traditional systems refer to analogue sound and film editing systems.)

1. For how long have you been working on post-production sector?

2. Approximately how many people do you think are working on post-production sector at Turkey?

3. What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?

4. Have you ever used traditional editing techniques?

5. Do you prefer traditional editing or contemporary editing for your work? (Questions 5.1. and 5.2. are going to be chosen according to the answer given for question 5)

5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?

7. Which workstation do you prefer and why?

8. Which way do you follow the developments of post-production technologies?

9. Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?

10. Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?

11. Does the commentary of audience have an effect on how you improve your techniques?

12. As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?

13. According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?

14. As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

14.3. Do you think this fact causes a profit concern for professional studios?

These questions have been asked to 15 people who are working in different fields of post-production sector for different time intervals. Some of them are working freelance but they are using post-production studios to finish the job they are given because film productions always work for professional studios for some reasons. Some of them are working for a company full time. This group contains people including sound designers, sound engineers, film music producers, motion graphics designers, editors, assistant editors and

programming coordinators. According to the given answers which can be seen in Appendixes, the current situation of post-production employees and the sector are going to be analyzed.

4.1. Effects of Technological Improvements According to Users

"As Edison and his contemporaries knew, photography and projection were the cinema's two major components. A century later, both would be transformed by a third technology born not of film or television, but rooted in managing information. And when this technology was applied to managing picture information, it would lead to the digital cinema revolution. That technology is the computer." (McKernan, 2005: 14)

4.1.1. Statements of Traditional System Exercisers

As mentioned before the interview subjects are from diferent fields of post-production sector. Most experienced person is Cem Kısmet who is a musician and member of well known music band "Pilli Bebek", film music producer and recently making musics of "Behzat Ç.: Bir Ankara Polisiyesi". He has been working on post-production area for about 17 years on and off. The least experienced is Erkut Demirci who is newly working as a sound technician at a post production company called "8 mm". Erkut Demirci has never worked on traditional editing systems but Cem Kısmet did.

When interviewees are considered according to Appendixes, there are 10 people which have at least once used traditional editing systems and have knowledge about them. 5 of these people say that they would prefer to work with traditional systems if the conditions were suitable. Actually these 5 people claimed that they would work with both of these systems, the others directly prefer contemporary systems. However the average value of the answer of 3rd question, the approximate percentage of contemporary editing system users in comparison with general users, is approximately 90.93 %. Before adverting on advantages and disadvantges of contemporary editing systems, the reasons these 5 people stated should be mentioned.

According to interviews, analog editing which is completed with workprints on flatbed machines as mentioned before, such as Moviola, is still being used for personal projects

editing or education of students. Some of the photographers also still use dark rooms for developing their films and printing them. People who use these old techniques are usually being working on their personal art projects and they do not have a concern about profit as Cem Kısmet stated "I would definitely prefer using the traditional techniques. However the real subject is time. The sector now defines the time period for a given project based on how fast the software works" (see Appendix II).

Actually it is important for digital editors to know the analog editing procedure to understand the basics of computer based editing. Aziz İmamoğlu indicated in his interview; "People working in traditional systems were experts in their fields. For example, a director knew what to picture, how to picture, and how to cut before shooting the film. This was same for the cinematography. Now it is much easier and possible to fix any mistakes with visual workstations. This situation causes the number of people who do their jobs the best to decrease. Expertise is dying. On the other hand, it has a big advantage for those who could not realize what they wanted with traditional systems. How wonderful the software are, there is not yet one which can pass the emotion to the audience, maybe one day" (see Appendix I).

On the other hand professional filmmakers which are films are bounded to production companies are obligated to work with digital editing techniques. Because these projects generally have deadlines and companies, they work under contract with, want their work to be finished in a healthy but efficient environment. Cem Kısmet stated this situation in his interview; "Yet if any given project gives me a year to finish the job than I would definitely prefer using the traditional techniques. However the real subject is time. The sector now defines the time period for a given project based on how fast the software works. On the other hand this presents a handicap for the artist because the producers give less and less time as they realize how fast and efficient the contemporary systems can work" (see Appendix II).

"The contemporary systems that we are using now are just the simulations and copies of the analog system. That is why sometimes they are successful sometimes not. When they are not I prefer traditional systems," said Mehmet Yaranona. Also Ezgi Sülün stated that "I can't get the real sound I am looking for according to traditional systems" and Fuat Güney added that "No matter what contemporary systems cannot give the quality of traditional systems in my opinion." Sound engineer and designer of "Behzat Ç.: Seni Kalbime

Gömdüm", Umut İsan explained that, "I may not be able to work with such systems except my education but what I know as a fact is that traditional systems give more organic and more realistic results. At the end of the day digital work flow is based on 'sampling' of the original stuff" (see Appendix XV). These people who have been able to experience traditional systems accept that both of the systems can be used time to time for one project. The other group accepts the traditional editing systems are not in use anymore and they do not need to use them.

"Each new technological development (sound, panchromatic stock, color) points to the viewers just how "un-realistic" the previous image was and also reminds them that the present image, even though more realistic, will be superseded in the future — thus constantly sustaining the state of disavowal" (Manovich, 2002: 170).

4.1.2. Advantages and Disadvantages of Contemporary Editing Systems According to Interview Results

Cinema is a technology, and the screen, or the multiplicity of screens that we have in the early twenty-first century, is a technological interface that influences not only what we see, but how we see it (Bennet et al., 2008). A lot of things changed in the sector, there are important innovations which helped filmmakers in a considerable extent. Today's filmmakers are reaching the dreams of Lumière Brothers maybe. It is easier to combine the necessary pieces of techniques to establish the expected goal.

As mentioned before, Edison's assistant Dickson worked on Kinetograph by using electric bulb which was an earlier invention of Edison. Technological improvements are carried in this way mostly. An earlier invention is lighting the path to another one. Newest technologies are mostly combined from earlier inventions. Cinema began as a technology of public projection, but it continues to develop as a screen-based media culture (Manovich, 2002).

The 6th question of interview asks interviewees, advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems. According to interviewees' answers, advantages of contemporary editing systems can be listed as follows:

- Practical, Easier correction; Possible mistakes can be corrected in seconds. Editors and engineers do not have to wait for print to see mistakes. There are lots of plugins and effects to apply easily on project, and preview the results in real time.
- Reduced costs; Post-production costs are reduced because of the time gained and also the techniques. Editors do not need a workprint to work on or have to create answer prints several times. And also new technologies are not unapproachable related to their prices.
- Time gaining; Benefits of digital techniques provided projects to be completed in a shorter time interval.
- Efficiency; The projects to be completed in shorter time allowed filmmakers to be able to work more projects in the time interval they used to work before.
- Modularity; Digital equipment is easier to carry when considered to traditional equipment. Equipment can be carried to another area in a short time interval.
- More functional – more optional; Colour timing, white balance or sound plugins are not limited. Editor can create parameters or can use several different effects which are presented within editing software.
- Easy to reach technology; Reduced costs make independent filmmakers to reach filmmaking and editing technologies smoothly. This caused the number of independent filmmakers to improve.
- Easy to carry data; Advances of data carrying technologies made possible to carry a project between workstations or studios easier.
- Using various formats of data; Only possible materials are not negatives now, today there are various formats digital media which can be used to edit.
- Reproducibility; It is easier to open projects in final state and arrange the cuts or effects again. And the same effects with same parameters can be used at different projects at different times and even different studios.

“Undo option is very convenient. You have the luxury of making a mistake” said editor Mustafa Gökçen (see Appendix XII). These new technologies and digital editing ability shortened the time needed for post-production. New systems enabled editors to jump from one scene to other scene of the film’s timeline with one click; this is what we call non-linear editing. Such as colour timing and transitions, as I referred before.

When traditional editing systems were used, editors had to wait the answer print to be developed before they could see the results of colour timing. Recently, with the advent of the Digital Intermediate process, digital technology's impact on filmmaking has taken another important step forward. This process, in which entire films are digitized, provides a whole new set of creative tools, allowing cinematographers unprecedented latitude in controlling and refining the final look of their film images.

Now with digital editing technologies, this can be done real time and in addition to this, there are ready to use parameters and effects which can be tried and removed with one click again. Editor can try these effects and arrange their parameters optionally and reach the look he or she wants or create the parameters and save them as presets to use again later with other similar or different projects. Or as Mustafa Gökçen expressed "undo" the wrong or unwanted result also Aziz İmamoğlu stated "Now it is much easier and possible to fix any mistakes with visual workstations" (see Appendix I).

Yet again regarding the subject of sound technology also played a great role that cannot be underestimated. Cinema changed course when talkies were offered for audiences' admiration. This is the reason for the second part of the historical evaluation of cinema in this research begins with the establishment of audio in motion picture. As sound production became an important element of cinema industry new circles of trade came to agenda. Sound engineers started to work on film post-production as the audio of the films are also needed editing. Manufacturers of sound technologies started to work on film sound production equipments. Today's Dolby Surround systems became available for cinema in this way. Nevertheless the advancement of technology continued and as a result it is now possible to install Dolby cinema systems in to houses.

Digital editing ability eventually provided the expenses to reduce. Cem Kısmet added, "Also there is the cost issue, for instance you can spend 5000$ on a contemporary system however you may need 4 or 5 times of such money in order to get the same level of work environment on a traditional system" (see Appendix II). For example, it is expressed of colour timing is easier without waiting for several answer prints. The results are printed as master print after making digital colour timing. On the other hand, when the existing technologies are improved and newer technologies become available, existing technology's prices are brought down by manufacturers. This is a reason also which provides the costs to be lower with the benefits of technology.

By means of improved computer technologies, more data can be saved in smaller carriers. IBM's first hard drive, invented in 1956, was able to carry 5 megabytes of data which is today actually needed to contain a song which is about five minutes long (Perenson, 2006). At the beginning of 2000s, an average personal computer's hard drive was able to contain for about 16 gigabyte data. Now there are flash drives with 16 gigabyte storage which you carry in your pocket. Today at the market there are external hard drives containing 1 terabyte of storage. And with flexible data carrying technologies, it is easy to move the project or preferred settings to other computer at the same studio or other ones.

Regarding this subject, Umut İsan stated that "The second important factor for me is the ease of retrieving, re-producing or duplicating previous result. I can take any previous projects that already finished from my backups and use the existing material to create new material or use certain results that has been used in previous projects on a project at hand. Also it is much easier to open the same project in different studios with similar equipment. The final reason is the broader spectrum of possibilities which in return supports creative workflow" and Fuat Güney added, "It is always faster and more practical to use new systems to be able to use the resource the best and for data transfers. It is undeniable to be blind to the importance of the rapidness when you think of the sector. That is why I prefer contemporary system" (see Appendix IX).

There may be reasons such as the production to change hands or enter into an agreement with another company. Or just the system may be not available at that moment so the project has to be carried to another system. This ability could be useful with this or similar other consequences.

"Contemporary system can be quite compact that gives you the freedom of workplace. You can use these modular systems wherever you want. You can just carry your laptop for some projects. Moreover it is another fact that set crew do not carry many equipment as they did before" as Cem Kısmet expressed (see Appendix II).

Beyond advantages there are also disadvantages of contemporary systems according to intervewees. These disadvantages can be listed as follows:

- Expertise is dying; Experts of this field have strengthened their knowledges based on traditional system experiences.
- Systems are aging rapidly; Rapid advancement of technology is causing current systems to be upgraded in a small time interval.

- Standarized work examples; Because of the plugins and effects which workstations offer and reproducibility, new outcomes result similar to each other.

"People working in traditional systems were experts in their fields. For example, a director knew what to picture, how to picture, and how to cut before shooting the film. This was same for the cinematography. Now it is much easier and possible to fix any mistakes with visual workstations. This situation causes the number of people who do their jobs the best to decrease. Expertise is dying" (Aziz İmamoğlu, see Appendix I).

Traditional editing techniques required to cut film. Of course workprints were created for cutting but a little mistake could result that workprint to be useless. Today directors are easily phrasing that the wrong shot can be cut at montage, it is not a big deal for editor. Indeed editors can cut unwanted parts with three or four mouse clicks from timelines of workstations. Earlier when traditional systems were in use, mistake of set crew could be a bigger problem for editors. To prevent from making mistakes, production crew had to be as careful as post-production crew. This fact provided traditional systems users to gain expertise while they learned their jobs in hardest way.

Also these ready to use affects and plugins within digital workstations give cause for editors and engineers to improve themselves limitingly. Mehmet Yaranona stated that "Traditional systems have only one processor that you have find out all the specs by yourself. This explains why the people doing this job in old time have excellent works" (see Appendix X).

Now color timing is not completed after several answer prints are finished. It is made real-time the results can be seen during the operation. This is an advantage for time gaining but also as is seen it is a disadvantage for expertise.

> "The unfortunate difficulty with technology, particularly audio technology, is that it is ever altering. Manufacturers and individuals in general are rarely satisfied with the creations we make. Because we seek perfection and we function from a standpoint of constant improvement, we are continuously striving to do much better. We as individuals are always in competition either with ourselves or with others. Over the last 100+ years, that determination and development has produced a slew of audio devices for recording and playback. As time progresses, a lot of of us have found that the devices we when previously loved have fallen into that obsolete category of dead or dying technology. We continue to cling to much of that old technology, be it audio or video, simply because there are memories attached to it – memories that can not be replaced" (Digital Technology, 2011).

While working on projects users can face with problems and they claim these problems to manifacturers in different ways. This is usually because they want to complete an action

easier and manifacturers evaluate these demands of users for an upgraded version of workstation. Approximately every year or once in two years upgraded versions of workstations are presented for the attention of users. Afterwards earlier versions become useless and to reach the industry standard almost ever studio have to upgrade their workstations. These workstations not only include software they also have hardware to integrate in computer systems. Eventually digital systems are aging rapidly.

As another advantage of contemporary systems, reproducibility has been introduced. Virtual memories of computers are getting bigger as their sizes are getting smaller. This allows projects to be saved and stored at these hard disks and used anytime anywhere that hard disk can be carried. And workatations contain various plugins and effects that are almost ready to use. On the other hand, this advantage brings a disadvantage with it. These ready to use plugins causes works to be similar with each other. As Mehmet Yaranona stated, “Contemporary systems unfortunately have a disadvantage that makes all the works look alike. When a person tries to apply the methods he newly learned, without any further knowledge, he or she is causing the resulted work to be similar with most of other people’s work” (see Appendix X). According to this evaluation, advantages and disadvantages can be tabulated as follows:

Table 4.1 Advantages and Disadvantages of Contemporary Editing Systems

ADVANTAGES	**DISADVANTAGES**
Practical	Expertise is dying
Reduced costs	Systems are aging rapidly
Time gaining	Standarized work examples
Efficiency	
Modularity	
Functional	
Easy to reach technology	
Easy to carry data	
Using various formats of data	
Reproducibility	

4.2. Current Situation of Sector According to Users of Contemporary Systems

Technological advancements at post production area eventually affected cinema sector as well. On this part, according to the answers of interviewees, current situation of cinema sector, audiences and studios are going to be evaluated. From 7th to 14th questions of interviews are related to these fields.

7th question is asking users the workstation preferations of them. According to results, 13 of 15 people prefer AVID as the brand of their workstations. The other 2 users only prefer Ableton and Final Cut. 6 of AVID users are utilizing AVID's Media Composer and 7 of them are using AVID's Pro Tools. One of the Pro Tools users also uses Apple's Logic and Ableton Live depending on the project's requirements. Another one also prefers Cubase, one of the Media Composer user also uses Final Cut. According to the table below AVID is the industry standard of Turkey today.

Table 4.2 Prefered Workstations of Interviewees

USERS	**PREFERED WORKSTATIONS**
Aziz İmamoğlu	Avid Media Composer – Apple Final Cut
Cem Kısmet	Avid Pro Tools - Cubase
Deniz Ünal	Avid Media Composer
Devin Komar	Avid Media Composer
Efe Özler	Apple Final Cut
Ender Balcı	Avid Pro Tools
Erkut Demirci	Avid Pro Tools
Ezgi Sülün	Ableton Live
Fuat Güney	Avid Pro Tools
Mehmet Yaranona	Avid Pro Tools – Apple Logic – Ableton Live
Mine Usluer	Avid Media Composer
Mustafa Gökçen	Avid Media Composer
Perran Yavru	Avid Media Composer
Umut İsan	Avid Pro Tools
Umut Uslusoy	Avid Pro Tools

8th question of this interview is related to following technological improvements. Most of them are using internet to follow advancements of post-production technology. 14 of the 15 interviewees are using internet, other one stated that he is exploring improvements by usage or learning from other colleagues. Also 5 of the remaining 14 users are following new technologies via their collagues besides internet. 2 of 14 users who explores improvements via internet and also reads related magazines.

Table 4.3 Interviewees' Ways of Following Technological Improvements at Post-Production

USERS	**WAYS OF FOLLOWING IMPROVEMENTS**
Aziz İmamoğlu	Internet - Colleagues
Cem Kısmet	Internet
Deniz Ünal	Internet – Colleagues
Devin Komar	Internet
Efe Özler	Internet - Colleagues
Ender Balcı	Internet
Erkut Demirci	Internet – Magazines
Ezgi Sülün	Internet – Magazines
Fuat Güney	Internet
Mehmet Yaranona	Internet – Magazines
Mine Usluer	Internet – Colleagues
Mustafa Gökçen	Usage – Colleagues
Perran Yavru	Internet
Umut İsan	Internet – Colleagues
Umut Uslusoy	Internet

If there was no communication, then there would be no way to perceive what the next person believes or values about life. Therefore the social process of communication is pivotal for society. Within our own society, communication can be observed in many different ways (Hall, 2002).

9th question of this interview was on audiences' choices on watching a film according to current situation. 10 of interviewees think that being able to watch a film at home on

computer and DVD players or downloading via internet reduces the number of audience watching a film at theatres. 2 of 15 people thinks that fact did not change the number and 3 of them are stating that depends on the structure of film audience or film.

After personal computers came into our lives, the interaction shape between human and the electronics changed. At first human technology interaction was in a directly physical contact way. After personal computers this interaction became visual and more personalized. In 1994 and 1995, "dot-com" was still a mystical term for many (Boyle, 2008).

The reason for questioning audience choises is to lead this research to examine another action of film makers. The question is if film makers are using technology's benefits to take audience's attention to theaters. There is a chain reaction between audience, filmmakers and films. Filmmaker adds on his production, evaluates the reaction of society and improves or changes the technique and style of his next production according to these reactions. This situation is a permanent reaction.

As expressed at earlier chapter, when television came to agenda, cinema lost attention for a while. This was when television's intimacy and reality took the interest of audience. But this made cinema to improve in another way, changing stories, concepts, editing and presentation styles and equipment also. This was when special effects and widescreen technologies improved eventually. And at motion pictures industry "Cinema Verite" movement has begun with a concern of catching these specifications of television as I mentioned before.

In the case of television, user has a control. User can zap the channel and select what to watch. Also the interactivity level is much higher on computer. User can stop playing the film to go outside and play again from where the film was stopped before. The database became an expression of the variability of new media: entries can be modified, added and deleted without consequences for the entity of the database; the user is granted random access to different kinds of multimedia objects (Weiberg, 2002).

The other important effect of audience is to share information and ideas related to the film they watch and film makers' reaction according to these commentaries. Following questions were related to this situation.

On 10^{th} and 11^{th} questions interviewees are asked if they are following the commentary of audience on the work they have participated and if these commentaries have an effect on

how they improve their techniques. 10 of 15 interviewees follow commentaries 4 of them not, and one of them sometimes follows.

On the other hand 6 of these interviewees stated that commentaries do not effect the improvement of their techniques, 7 of them accepted that there is such an effect and 2 of them indicated that commentary of audience sometimes has an effect on how they improve their techniques.

Table 4.4 Do You Follow the Commentaries of Audience on Works You Participated?

Following the Commentary of Audience	**Not Following the Commentary of Audience**	**Sometimes Follows the Commentary of Audience**
10	4	1

Table 4.5 Do These Commentaries Have an Effect on How You Improve Your Techniques?

Have an Effect	**Does not Have an Effect**	**Sometimes Have an Effect**
7	6	2

In the post-production sector, the audience is not the creator of the techniques. Audience is the one who taste the results of these techniques. However they are the significant norms with their responds to filmmakers. Editors' choices are eventually affected by audience, with colour corrections or transitions. There are several ways to express the emotion of the film for the editor as mentioned before of course. For a dramatic scene fade in and fade out can be used for transition and colours can be arranged according to the purport feeling for example. On the other hand, audience generally likes vintage colours at films. This is some kind of information which gives the editor a choice to attract audience. And editor can reach that information through internet easily. "Of course. Audience reaction is very important. After all we all work for them. Whether it is newspapers, personal blogs or social media, I follow them as much as I can"(Devin Komar, see Appendix IV).

People today are meeting with others via internet and striking up friendships. They are writing their favourite books or movies on their profiles so they can be in connection with people with similar habits. They can "Google" the films they wonder about, they can follow the further works of their favourite directors and they can learn when a new film is

going to be released in a minute. Even they can find behind the scenes photos of films they have watched and figure out how that film was produced. Audiences are not talking about the films at coffee shops instead they are writing down their thoughts to their blogs and waiting for similar responses. Television and the computer have been used to bring cinema into the home, and mobile devices such as phones, laptops, PDAs and multimedia jukeboxes are bringing cinema into new public spaces outside of cinemas (Bennet et al., 2008).

On 12th question interviewees were asked if they think the wide range of almost ready to use visual and sound effects options causes the story strength of films to be of secondary importance. 4 of them thinks that situation depends on the film, 3 of them agreed that effects cause story of the film to be secondary importance and 8 of them do not agree this is related to the strength of story. They think that effects only could be helpful to strengthen the story.

Table 4.6 Do Wide Range of Visual and Sound Effects Causes the Story of Film to be of Secondary Place?

Yes, it causes	**No, it does not**	**Depends on film**
3	8	4

One way or the other, going to cinema for watching a film or watching it at home, either way concept of cinema is indispensable. Filmmakers strongly prefer their films to be watched at cinema of course. According to researches 3-D audience are more than 50% for the last couple of years. North America accounted for 36.1% of tickets sold for 3D movies, down from 42.3% in 2009, while the rest of the world made up the other 69.3%, up from 53.8% in 2009 (Block, 2011). According to this research I adressed 13th question to interviewees. They are asked if making 3-D films is a strategy which filmmakers use for taking the attention of audience to theaters. 11 of 15 interviewees stated that this is correct, 3 of them did not accept this strategy to be real and only 1 interviewee thinks that it is possible and sector is more about consumption now. There is a fact that until quite recently, the only way to watch these films was to go IMAX cinemas, but of course with the speed of technological improvements, 3-D televisions are available now. DVD of a 3-D film can be bought and watched at home comfort, in interaction with that film. “Yes, but

technology remedied this and in short time we will have 3-D TV in price of a plasma TV" (Devin Komar, see Appendix IV).

Table 4.7 Do You Think Making 3-D Films is a Strategy which Filmmakers Use For Taking the Attention of Audience to Theaters?

Yes	No	Depends on film
11	3	1

The last question of the interview is 14th question and it is sectioned to three according to this phrase; "As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today".

The first question related to this phrase is if this situation is an advantage for independent filmmakers and all of the interviewees answered positive.

With a few research on the internet several independent production companies or independent filmmakers can be found. There is a strong distribution style like internet and independent filmmakers are trying to use this power efficiently. They are able to reach large amount of audience quite easily. YouTube, Vimeo and other video sharing web sites are really popular and easy to use and also it is free to be a member and upload videos and view them. Most of the people use these web sites to find whatever they want related to any subject as today there are significant resources which provides valuable and genuine information virtually about everything. After uploading these videos, they can be shared at Facebook, Twitter, Tumblr and similar social networking sites. Several filmmakers are able to reach many people from different countries this way and share their work with them and in turn become appreciated artists for their audience.

Most people can have editing technology on their personal computer at home and a HD recording camera. Any of the editing software can be downloaded from manufacturer websites. Also when a person wants to learn how to use one of these, he or she can simply search for visual or written tutorials from internet. Even they can find how to create effects with software included to these tutorials. At the earlier chapter, special effects bluebox and greenbox were mentioned. This was a big innovation at the beginning and now anybody can use this effect at their home.

Second related question was if this situation could reduce the number of productions produced at professional post-production studios. 9 of the interviewees answered negative, no matter how the semi-professional equipment advances, these can not reach the quality of professional equipment.

“Professional work is done with money. Nobody can show the film at theaters if they’ve made at home. If they want to show them they have to work with professionals” (Mustafa Gökçen, see Appendix XII).

“The technological improvements actually increase the number of project that can be done in a given period of time at a given studio or production facility by giving increasing the efficiency or preventing the repetition of an error. Nevertheless it is possible to claim the availability of such technologies to people like independent directors or etc. do not decrease the number of jobs or projects in professional facilities even by this factor alone “ (Cem Kısmet, see Appendix II).

“For commercials and short films, yes, but for films and TV show, one cannot give up on studios” (Devin Komar, see Appendix IV)

Last question and the third section of questions related to the phrase above is, if they think this fact causes a profit concern for professional studios. 8 of the interviewees answered no, 5 of the others answered yes and last two expressed that depends on the budget of the project.

“Because, no matter what kind of equipment you have for personal usage, a film should be processed in professional studios to be able to put on the cinema screen” (Aziz İmamoğlu, see Appendix I).

“I don’t think so. Only budgets are getting smaller, as long as job opportunities increase, people continue to make money. Earlier, if they were making 5 dollars in one job, they make 5 dollars in 3 jobs now, gaining from demand. The only difference is that working hours have increased” (Mustafa Gökçen, see Appendix XII).

Cinema is an entertainment business besides it is a branch of art. There is a box-office concern at cinema as we know. And this concern eventually affects set crew and post-production studios also. This is a reason why motion pictures industry is always trying to pull the audience to cinema with innovations. In a comprehensive point of view, filmmaking and editing technology has been a profit making industry since first films were

being presented to audience against payment. The wider motion picture industry got, more production companies were formed and this position eventually brought the idea of an organization for production companies and filmmakers.

Today, as it can be noticed in these interviews, post-production workers are claiming that maybe more works are completed but their prices are less. Regarding this, first attempt to take motion pistures industry under control was in 1922. The presidents of the major motion picture studios, including Samuel Goldwyn, Louis B. Mayer, Jesse Lasky and Joseph Schenck, formed the Motion Picture Producers and Distributors Association of America to resist mounting calls for government censorship of American films (MPAA, 2011). Government put its hand on motion pictures industry eventually.

This was excluding independent filmmakers of course. This improvement was helpful for the motion pictures industry to be organized between each other. However today, with the benefits of easy to reach technologies, number of independent film makers is increasing according to this analysis.

5. CONCLUSION

Within this thesis, the effects of rapid advances at technology of post-production are evaluated. In order to complete evaluation, first part of this thesis is containing the review of researches related to technology, communication and interactivity. Second part is based on historical evaluation of technological improvements at post-production area in cinema sector. Within the last part, the effects of these improvements on post-production area of cinema sector are analysed according to interview results of a group who works at post-production field.

Technology and its development have been broadly discussed subjects between philosophers and researchers as mentioned in earlier parts. According to these researches at the first main part of this thesis following result can be induced. Instrumentalis theory of technology argues that technology does not carry a value in itself but users attribute value to it. When the development is completed, society starts to attribute independent meanings to them with their purpose of usage. In this means society can not yield to the benefits of technology but there is somewhere a choice for humanity which provides to control the relationship with technology.

In table 2.2, categorization of understandings in philosophy of technology is shown. According to answers that are obtained from interviews, post-production professionals are using technology as an instrument. Altough some of them states that they would prefer using traditional techniques for their works, they add they have to take advantage of benefits of contemporary techniques in respect of the current situation of post-production sector. They use contemporary techniques to finish their work faster and effective so they can reach the speed of sector. In conclusion, current situation of post-production professionals according to philosoph of technology accord with instrumentalist theory of technology.

Although apocalypse lovers in Hollywood enjoys giving near-future prophecies in which humanity become slaves of tyrant machines, computers or etc, it is still the human beings at the wheel of technology and again it will only be the human beings that will architect their own demise.

Technological developments are being nourished from knowledge. Every new research brings up new knowledge related to the research area. And innovators are trying to achieve new technologies to feed the needs of society. From the moment computers were available

to be used by not only engineers but also ordinary people, interaction level improved between them. Keyboard and mouse evolved into touchscreen technologies which are widely used with smart phones today. The last two years, some manufacturers inserted touchscreen technology on tablet computers. Cursor is human finger and the keyboard is starting on the screen in case it is needed.

Within the second main part of this thesis, technological improvements at post-production area have been historically reviewed. According to this review, post-production processes have been digitalized and analog systems are rarely being used for personal projects mostly.

Last part of this thesis contains analysis of interviews with post-production area workers. According to this analysis, several results have been reached. These results can be summarised as follows.

This digitalization has provided film editing procedure to be completed in a shorter time interval and reduced cost and this is an avail on spare time and budget to be available for more projects. Also new technologies become cheaper with the release of similar products from different manufacturers.

This reduced costs of technologies and equipments provided number of independent filmmakers to increase. An ordinary person is able to buy enough equipment to create a film for web standards. In addition if this person has an average personal computer he or she can use editing software easily. These independent filmmakers also used internet technology to distribute their works all around the world.

However, as analysis of interviews show, professional studios do not have to be afraid of independent film makers. In order to present a film at theaters, it has to be processed at professional studios. Some interviewees stated that not films but little production such as commercials can be completed at independent home studios.

Another result is that, data storage technologies enabled carrying a project from computer to computer or studio to studio. This improvement is helpful for reproducibility of a project also. Traditional editing systems only allowed limited colour timing or effect options but these digital systems provides editors a wide range of ready to use effects which have editable parameters. Editor can just save these parameters as presets and use on different cuts or projects. Also visual effects and 3-D modelling technologies are improved and becoming more effective day by day.

According to results, 8 of 15 interviewees think that wide range of special effects do not cause the story of films to be of secondary place. However some film theorists argue that visual effects' effectiveness is causing the stories of the films to fall behind them. Audiences are exploring incredible visual effects while the story continues.

Audience has a limited role on post-production developments such as expressing their ideas about used effects or transitions via various communication technologies and taking advantage of new digital distribution styles. 10 of 15 interviewees accepted that they are following audience commentary mostly from internet and only 6 of them think that commentaries do not affect how they improve their techniques.

Also 10 of the interviewees think that being able to watch a film at home reduced the number of audience who watches film at theatre. Related to this subject, they were asked if making 3-D films is a strategy which film makers use to take audience's attention to cinema. 11 of the interviewees agree that this is used as a strategy. However, with the advances at technology, people are able to watch 3-D films at their homes on TVs.

As mentioned before, society needs new technologies and innovators work on creating these technologies by combining current inventions. Technology's development is continuous and process is gaining speed with high level of human-computer interaction.

Final statements according to this thesis are as follows; from the viewpoint of communication technologies, it is possible to reach larger amount of people, but increasing level of interaction between man and computer is reducing the level of face to face communication into communication with immediate surroundings actually.

Technological improvements at post-production sector accord with instrumentalist theory of technology. Technological advances are allowing post-production professionals to accomplish results in a faster and more effective way than it was earlier.

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APPENDIX LIST

- **Appendix I** Interview with Aziz İmamoğlu
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- **Appendix XV** Interview with Umut İsan

- Hereby non linear digital film and sound editing techniques are taken as **contemporary systems**, **traditional systems** refer to analogue sound and film editing systems.
- Questions **5.1.** and **5.2.** are going to be chosen for answering, according to the answer given for question **5.**
- Questions **14.1.**, **14.2.** and **14.3.** are going to be answered according to the phrase in **14th** question.

Appendix I

Interview with Aziz İmamoğlu (1980) - Editor of films such as "Barda", "Behzat Ç.: Seni Kalbime Gömdüm".

1. **For how long have you been working on post-production sector?**

   11 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   It is hard to answer this question with numbers. Especially if you think of all the new graduates from art and communication schools and all the other personnel working in the TV series, commercials, video clips, and film sectors that have grown tremendously in recent years. I can say 1000 people as an approximate answer.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   I could not give a number but the analog system that you are talking about is no longer in use. So I could say %99 of them maybe.

4. **Have you ever used traditional editing techniques?**

   Only in one film, "Barda". The arrangement in this film is done with negative montage system after it was cut with a digital system.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I prefer contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   First and the most important reason is that traditional systems are no longer in use. However beyond this, post-production as its name is the process after production; so all the work done earlier determines your workspace.

5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

People working in traditional systems were experts in their fields. For example, a director knew what to picture, how to picture, and how to cut before shooting the film. This was same for the cinematography. Now it is much easier and possible to fix any mistakes with visual workstations. This situation causes the number of people who do their jobs the best to decrease. Expertise is dying. On the other hand, it has a big advantage for those who could not realize what they wanted with traditional systems. How wonderful the software are, there is not yet one which can pass the emotion to the audience, maybe one day.

7. **Which workstation do you prefer and why?**

Recently Final Cut Studio, before when first started this job Avid. Each of the software has different easiness for different conditions. I mostly prefer the software that satisfies the requirements of the job and makes it easier to focus on the subject.

8. **Which way do you follow the developments of post-production technologies.**

Mostly internet and colleagues. But the real way that I follow is to select the jobs which require techniques that I have less knowledge, spend some time on it, and learn with the hard way. If you spend enough time in the sector, you see that the only change is mostly the names. Contents and real changes improve very slowly maybe because of the economical factors.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

Absolutely it does. However in these days, because all of the shopping malls have cinema theaters inside and these theaters have a different atmosphere according to

houses, I believe still there are people choose to go to the theaters. Or I just want to believe in this.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    No, I don't.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    No, it does not.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    No. At the end the story that the audience watch is only what you show them. If it is required for the story you have to use it. For instance, the film called Perfume. Although it has an enormous budget and a lot of visual and sound effects, you never get far from the strength of story itself. On the other hand, action films are not expected to fascinate people with its storyline.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Porn sector is the most triggering effect in visual entertainment's improvements. Blu-ray systems or 3-D technologies are all applied to this sector in first place. Afterwards these were applied in other sectors. You cannot use this technology for all of the stories. It's also impossible and pointless to turn all of the films into this format. But is new and audiences love new stuff.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain**

the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes, absolutely.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

It reduces but the quality of work is important. Because, no matter what kind of equipment you have for personal usage, a film should be processed in professional studios to be able to put on the cinema screen.

14.3. Do you think this fact causes a profit concern for professional studios?

This concern is always valid, because a studio is also a business organization.

Appendix II

Interview with Cem Kısmet (1969) – Film Music Producer, Sound Designer of films such as "Behzat Ç.: Seni Kalbime Gömdüm".

1. **For how long have you been working on post-production sector?**

   16-17 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   It is impossible to give a definite number. Given the number of companies in post-production sector and considering the number of freelancers we can estimate a little more than one thousand including the editors, assistants, tape-converter guys, etc.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   Well i guess above 95% of the sector works with contemporary editing tools.

4. **Have you ever used traditional editing techniques?**

   Yes, I used to work with traditional techniques which were more organic and genuine. However digital era created certain tools to create such organic perception as a result you start to use more tools than before and this brings the question of efficiency in a sense.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   It is not a question of choice actually. It depends on the system you can reach. Actually I work with the one that allows me to finish the job sooner. Yet if any given project gives me a year to finish the job than I would definitely prefer using the traditional techniques. However the real subject is time. The sector now defines the time period for a given project based on how fast the software works. On the other hand this presents a handicap for the artist because the producers give less and less time as they realize how fast and efficient the contemporary systems can work.

5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

The most important factor is speed, and also the number of possibilities and options. It cannot be underestimated that contemporary systems provided certain jumps regarding efficiency. Although there is a catch here, if you aim for a big composition or similar multi-elemental pattern that I don't believe there is a difference between contemporary systems and traditional system regarding efficiency or speed.

5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

Well, first of all I prefer the organic feel of traditional systems upon the digital or contemporary systems. However, the sector did not evolve in such manner. There is neither a studio or facility that can provide such old fashioned workflow understanding or any infrastructure that can allow the development of such in Turkey. Thus my choice had to be contemporary systems.

6. What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?

As I have mentioned the first advantage is speed or efficiency. The second advantage is that contemporary system can be quite compact that gives you the freedom of workplace. You can use these modular systems wherever you want. You can just carry you laptop for some projects. Moreover it is another fact that set crew do not carry many equipment as they did before. Also there is the cost issue, for instance you can spend 5000$ on a contemporary system however you may need 4 or 5 times of such money in order to get the same level of work environment on a traditional system. However the other fact is that you cannot expect the former to even emulate the quality of the latter. Nevertheless as the technology improves our sensation and perception also changes together with the improvements or developments in technology. We re-define our perception and our 'new' perception start to ignore the difference between the old and the new. For example when black-and-white films were re-mastered as color films only the selected few that

have seen the original one cares or evaluates the new colored version. It can be said that new and old are in a sense interleaved in the current situation.

7. **Which workstation do you prefer and why?**

   Most of the time I use Pro Tools but for certain applications I prefer Cubase.

8. **Which way do you follow the developments of post-production technologies.**

   Actually I don't want to dig into such developments as long as I don't have to use. What i actually want to focus is how I compose or create, yet I can say that my main source is the internet.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   I don't think that these possibilities can mean a decrease in the cinema followers, or on the number of the people that go to cinema. Nevertheless we can say that such possibilities did not decrease the number of cinema audience but increased the number of the people that watch films.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    No.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    No.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

It is hard give a direct answer. It is possible that such effects and stuff can maximize the existing power of the story, maybe you have a very powerful story and you can use such tools to create extraordinary scenes but at the same time you may have a crappy story and you can use the same effects just as a make-up for the weakness of the hood. I believe that depends on the intention of the user.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    It can be interpreted as the attempt of the popular culture to impose the cinema as the leading or dominant art so it can be said that such techniques have the potential to increase the number of the audience.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

    14.1. Is that easy to reach technology an advantage for independent filmmakers?

    Of course, first of all every technological improvement gives many new possibilities and advantages to those who can create or who works in creative fields.

    14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

    The technological improvements actually increase the number of project that can be done in a given period of time at a given studio or production facility by giving increasing the efficiency or preventing the repetition of an error. Nevertheless it is possible to claim the availability of such technologies to people like independent directors or etc. do not decrease the number of jobs or projects in professional facilities even by this factor alone.

14.3. Do you think this fact causes a profit concern for professional studios?

I think these had been all considered by the major actors of the business before opening such technological improvements to the public so I think the availability of these improvements, tools or other software to people have nothing to do with the profitability of a production facility. Moreover we should consider that the capabilities of studios even small ones are much more than any given semi-professional or home user.

Appendix III

Interview with Deniz Ünal – Programming Coordinator at Fox International TV Channels.

1. **For how long have you been working on post-production sector?**

   7 years

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   I guess about 5000 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   % 90 of these people.

4. **Have you ever used traditional editing techniques?**

   No, I didn't.

5. **Do you prefer traditional editing or contemporary editing for your work? (Questions 5.1. and 5.2. are going to be chosen according to the answer given for question 5)**

   I prefer contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   These systems are faster and more effective.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Faster and more effective as I expressed.

7. **Which workstation do you prefer and why?**

   AVID's Media Composer.

8. **Which way do you follow the developments of post-production technologies.**

   Internet and dialogues with co-workers.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   I don't think it is applicable for domestic production. However in the case of foreign productions, illegal distribution has a negative effect on the number of people going to the theaters.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    Sometimes, only with face to face communication.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Yes, it does.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    This is extremely related to the cinematographer's creativity. I think ready to use material doesn't really kill the creativity. However factors such as budget and vision restrictions may have a negative effect.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

Yes.

14. As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

I think it is related to the budget. If there is budget, post-production studios continue working.

14.3. Do you think this fact causes a profit concern for professional studios?

Yes, it does.

Appendix IV

Interview with Devin Komar (1984) – Assistant Editor of films and TV series such as "Eyyvah Eyvah" and "Komedi Dükkanı".

1. **For how long have you been working on post-production sector?**

   I've been an assistant editor since 2007.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   Every year, new and extensive production companies establish, thus personnel working in this business increases. There are probably over 400 people working in different areas such as sound mix, montage and color correction.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   90%.

4. **Have you ever used traditional editing techniques?**

   No, I didn't, because it has lost its validity.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I prefer contemporary editing.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   New systems are designed so that they come through with a fastest and a clear manner. We now are in a sector that race against time and for that reason, analog systems are not preferred.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

They are more functional, easier to use and you can always crosscheck.

7. **Which workstation do you prefer and why?**

   I prefer AVID's Media Composer because it is solely designed to work on montage and it constantly renews itself.

8. **Which way do you follow the developments of post-production technologies.**

   Frequently from internet updates, because accomplishing my work rapidly and comfortably is very important for me.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Technology advances very quickly, and everybody has a home cinema system. With films being so overpriced, people use the luxury of enjoying cheapest films and they can watch as many as they like.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    Of course. Audience reaction is very important. After all we all work for them. Whether it is newspapers, personal blogs or social media, I follow them as much as I can.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Yes, knowing where they react, what they laugh at or what they do not like is important in terms of improving ourselves. For example, we can understand if the joke is understood or not by this means.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

These effects definitely have one to one impact on films. If it is used inaccurately, it might avert the film with a bad review. There are many examples of this.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Yes, but technology remedied this and in short time we will have 3-D TV in price of a plasma TV.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

    14.1. Is that easy to reach technology an advantage for independent filmmakers?

    Yes, this is the biggest evidence that shows infiniteness of these people's ingenuity. Therefore, people who truly want to perform this job, decide precisely and explicitly. This is both an advantage and a disadvantage. It is advantageous in terms of price, but disadvantageous in terms of accomplishing the task quickly, because the equipment and personnel in companies are much expensive than one can keep in his or her home.

    14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

    For commercials and short films, yes, but for films and TV show, one cannot give up on studios.

    14.3. Do you think this fact causes a profit concern for professional studios?

    Certainly. Especially because they are short and many in numbers, commercial revenues are in constant circulation and this is an opportunity that post production companies do not want to miss, for they earn most money from the commercials.

Appendix V

Interview with Efe Özler (1983) – Motion Graphics Designer at İmaj Post-Production Studios.

1. **For how long have you been working on post-production sector?**

   5 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   About 5000 people I guess.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   95%.

4. **Have you ever used traditional editing techniques?**

   Yes, I used.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I prefer contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Because it is cheaper and easier to have full control on the process. If a mistake is done, it allows you to go back in the process real-time, find the mistake, and correct it.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Contemporary techniques are cheaper and more effective.

7. **Which workstation do you prefer and why?**

   Apple Final Cut Studio. Becuase Mac OS gives less errors and I experience less hitches.

8. **Which way do you follow the developments of post-production technologies.**

   Forums on the internet, vimeo.com, websites related to the sector such as creative cow, and co-workers.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Yes I think it reduced the number of people going to the cinema theaters.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    Yes, I am trying to follow. I am reading the criticisms coming to post-production studio that I'm working at.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Yes, it has a positive effect. It motivates you when people have a reaction to your work.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    Yes, I think there is an effect like this.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

Yes.

14. As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

Yes, it is reducing.

14.3. Do you think this fact causes a profit concern for professional studios?

Yes.

Appendix VI

Interview with Ender Balci (1974) – Sound Engineer of films such as "NEFES: Vatan Sağolsun", "Behzat Ç.: Seni Kalbime Gömdüm".

1. **For how long have you been working on post-production sector?**

   I've been working on sound technologies for 15 years however during 5 years I've been also working on post-production.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   Because of the lack of a union of profession, it is hard to say something. However, if we consider total of people working on sound and visual, it wouldn't be an exaggeration to say 5000 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   I would say 80% with the fast progress in digital technology.

4. **Have you ever used traditional editing techniques?**

   We use analog/digital hybrid systems for sound technologies.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   My preferences differ according to the job's format and subject.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   These systems are faster and more practical. Also budget concern makes me choose contemporary systems.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

   Digital outcomes do not always satisfy me like traditional systems do.

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Contemporary techniques have a greater percentage when operational rapidness and cost calculations are included. Its advantages are variable according to the subject of the production. However the resolution quality of analog systems is always wanted. Sometimes, this is a disadvantage of the digital systems too.

7. **Which workstation do you prefer and why?**

   AVID Pro Tools.

8. **Which way do you follow the developments of post-production technologies.**

   Internet and international fairs where producers introduce their new technologies.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   People want to have quality stuff. If they can afford it they go to the cinema theaters. Others prefer to watch films on their TV, iPad, iPhone etc.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    Off course I ask my friends' opinions about the film and music DVD and albums I was involved. However people outside of the sector see this situation more clearly than us

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Yes**.**

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects**

options. Do you think that situation causes the story strength of films to be of secondary importance?

This is absolutely about what you dream about when you shape the film in your head. It is very different if you are picturing a documentary or a fiction film.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    This is absolutely about what you dream about when you shaping the film in your head. It is very different if you are picturing a documentary or a fiction film.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

    14.1. Is that easy to reach technology an advantage for independent filmmakers?

    Yes, of course.

    14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

    No, I don't think so.

    14.3. Do you think this fact causes a profit concern for professional studios?

    Not, actually.

Appendix VII

Interview with Erkut Demirci – Sound Technician at 8mm Studios.

1. **For how long have you been working on post-production sector?**

   1 year.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   Around 500-750 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   95%.

4. **Have you ever used traditional editing techniques?**

   No.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   Contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Fast, practical and less expensive.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Advantages are these systems are cheaper, faster and more effective. I think there is one disadvantage and that is rapid aging.

7. **Which workstation do you prefer and why?**

   Pro Tools, because it is world standard. Practical and compatible.

8. **Which way do you follow the developments of post-production technologies.**

   Internet and magazines.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Yes.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    From my colleagues in the sector.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    No.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    No. On the contrary it makes stronger. If the story is strong it stays on the front.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Yes.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

No.

14.3. Do you think this fact causes a profit concern for professional studios?

No.

Appendix VIII

Interview with Ezgi Sülün (1983) – Sound Engineer of documentary film "Mamak'ta".

1. **For how long have you been working on post-production sector?**

   6 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   Approximately 500 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   90%

4. **Have you ever used traditional editing techniques?**

   Yes, as a part of my education I did.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I prefer contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   They are simple and cheap. So that they can easily be used during the post – production.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Simpler and cheap but I can't get the real sound I am looking for according to traditional systems.

7. **Which workstation do you prefer and why?**

   I prefer Ableton Live because it is so user friendly. It has a great interface and it is very useful for a sound engineer.

8. **Which way do you follow the developments of post-production technologies.**

   From internet, sound engineering forums and websites, and magazines.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Maybe. They prefer to go the cinema if the film has great sound or visual effects.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    Yes I do. Usually from internet.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Of course it does.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    No I don't agree with this idea.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Yes I absolutely agree with it.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional**

equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes it is.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

I don't think so.

14.3. Do you think this fact causes a profit concern for professional studios?

No, I don't believe that.

Appendix IX

Interview with Fuat Güney (1978) – Sound Designer of films and TV series such as "Mustafa Hakkında Herşey", "Behzat Ç".

1. **For how long have you been working on post-production sector?**

   I finished 10 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   It's hard to give a correct number. But I'm guessing around 500.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   There is a few traditional system users if we think there are around 10 professional companies, so we can say approximately %85 of the general of these prefer contemporary systems.

4. **Have you ever used traditional editing techniques?**

   I work for the sound systems in the sector. And I started to sound engineering by taking the traditional methods class. But I'm following the revolution in technology.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I think we should use both systems at the same time; because sometimes you need the gifts of one system sometimes of the other.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Faster, more effective, cheaper, practical for data carriage or correction.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

No matter what contemporary systems cannot give the quality of traditional systems in my opinion.

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   It is always faster and more practical to use new systems to be able to use the resource the best and for data transfers. It is undeniable to be blind to the importance of the rapidness when you think of the sector. That is why I prefer contemporary system.

   But as I said quality of traditional systems cannot be denied.

7. **Which workstation do you prefer and why?**

   Mac computer system. Pro Tools and professional sound materials such as plugins.

8. **Which way do you follow the developments of post-production technologies.**

   From internet.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Yes.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    I have profiles on social media groups and Sinematurk's website. Sometimes I am checking comments.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    No. Actually I don't think there are audiences at that level.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects**

options. Do you think that situation causes the story strength of films to be of secondary importance?

I don't think there is, on the contrary I would say it has a positive effect.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Possible, sector is more about consumption now.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

    14.1. Is that easy to reach technology an advantage for independent filmmakers?

    Yes.

    14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

    No.

    14.3. Do you think this fact causes a profit concern for professional studios?

    There is no way to produce a final product with semi professional equipments. Internet triggers this; but professional media wouldn't allow it to happen.

Appendix X

Interview with Mehmet Yaranona (1983) – Sound Designer and Engineer at Opus Studios.

1. **For how long have you been working on post-production sector?**

   4 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   A lot, not a specific number but I guess around 5000 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   More than 80% I guess.

4. **Have you ever used traditional editing techniques?**

   I did, but it was a hybrid system. I did not use both systems in every step of the work, only in some.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Much easier and possible to correct mistakes. A system based on trial-error, on the other hand easy to carry physically and easier to install. Cheap too.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

   The contemporary systems that we are using now are just the simulations and copies of the analog system. That is why sometimes they are successful sometimes not. When they are not I prefer traditional systems.

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

Contemporary systems unfortunately have a disadvantage that makes all the works look alike. When a person tries to apply the methods he newly learned, without any further knowledge, he or she is causing the resulted work to be similar with most of other people's work. On the other hand contemporary systems are much cheaper, easy to find and use. Wear and tear is very rare when compared to traditional systems. Furthermore, there are a lot of plugins to play with, you can easily get lost. Traditional systems have only one processor that you have find out all the specs by yourself. This explains why the people doing this job in old time have excellent works.

7. **Which workstation do you prefer and why?**

   I work with whatever I have to use for a specific job. But I would choose AVID's ProTools, Apple Logic, and Ableton Live.

8. **Which way do you follow the developments of post-production technologies.**

   Websites of the brands that I use and forums related to sound engineering. Sometimes magazines.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Yes I think it did. But there are also the economic facts. Some films don't matter if you watch them home or in the theater. For example a film like 'Avatar' of course should be seen in the theater to fully feel it.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    No, I don't really do. Clients give their feedbacks and I have to cooperate with them.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

Of course it does. But more specifically the things that I watch and do a research about them improves my technical knowledge a lot.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    I absolutely think so. A lot of films have lost their meanings because of this problem. However there still are great films that keep being fascinating. So it really depends on the film.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Yes, but I think 3-D is a temporary technique that tires eyes and muscles of eyes with an illusion. So I don't think it will be permanent and I don't remember loving a film just because it had 3-D technology.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

    14.1. Is that easy to reach technology an advantage for independent filmmakers?

    It absolutely is an advantage. Maybe a disadvantage for those who don't really know how to use it.

    14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

    Yes it does. But still if a certain quality is needed, professionals are the best option.

14.3. Do you think this fact causes a profit concern for professional studios?

Yes it does. But this doesn't mean that investment on the sector have to be lowered. Because knowledge and experience are the key point in this sector like others. If you are good at these points, there is nothing to fear about. The most important point is the quality of the result in any work.

Appendix XI

Interview with Mine Usluer – Editor at FOX International Channels.

1. **For how long have you been working on post-production sector?**

   7 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   Around 5000.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   85% I guess.

4. **Have you ever used traditional editing techniques?**

   No.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I prefer contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   I have learned and experienced on these systems.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Rapidness, to be able to complete an action in more than one different ways. Easy to correct the mistakes.

7. **Which workstation do you prefer and why?**

   AVID's Media Composer.

8. **Which way do you follow the developments of post-production technologies.**

   Internet and my colleagues.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Yes I do.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    I read the comments online but not regularly.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Time to time it does.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    Depends on how you use these effects I think.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    Yes.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

Mostly not.

14.3. Do you think this fact causes a profit concern for professional studios?

Maybe, because the number of works increase but budgets do not.

Appendix XII

Interview with Mustafa Gökçen (1980) – Editor of films and TV series such as "Eyyvah Eyvah", "Komedi Dükkanı".

1. **For how long have you been working on post-production sector?**

   For 13 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   For only in Istanbul, I believe there are 1000-2000 people who work in local and dedicated channels. If we include Turkey entirely, it would be around 5000 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   95%.

4. **Have you ever used traditional editing techniques?**

   Yes I did.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   Of course I prefer contemporary systems, who doesn't want to use 'undo'.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Undo option is very convenient. You have the luxury of making a mistake. I believe this is the biggest reason for preference. Apart from that there are millions of options. Dominating all equipment at the same time. Being able to create many versions by copying the parameters you've created. Mouse usage which you can access many parts of the video and audio with one click. Convenience of visual and sound effects usage. Using data in various formats, you can transfer data from an analog or digital tape, CD or DVD. And other millions of reasons.

5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   The downside is you have to wait for the transfer of the equipment before working. The only advantage of traditional systems is being able to start working immediately. As soon as the shooting is over you can start the montage. Of course, this will be a disadvantage in long sessions with lots of equipment, with lots of tape changing if you're not ready, and it will be time consuming in the long run.

7. **Which workstation do you prefer and why?**

   AVID's Media Composer. Compared to other programs, it is more user-friendly even though it is more complex. For example, in other programs there's normally one way in order to trim, but in AVID you have multiple ways to trim.

8. **Which way do you follow the developments of post-production technologies.**

   Generally, you have to learn the ways of new technology because it catches very fast in Turkey. For example, you have to use the proper AVID version in order to work with p2 cards. It's the same situation when shooting is completed with high definition on hard disks. Technology advances so fast so that you have to learn it yourself or ask the people who know about these programs.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Somewhat yes, but if you made a good film, you can easily access the certain film audience in Turkey. If people have the money, they will see that film. If it's bad, I believe they will only buy the DVD if they're curious and they missed it before.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

Of course I follow them. Generally from the internet. I follow it from the websites that you can get a true feedback.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Normally no. Because the critics of the people are focused on overall project. Nobody says the montage is bad, they say that the film is bad. Your techniques get better with experience and analyzing other work.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    I don't think so. Technology makes your job easier and enables you to make a better film because it's a tool. This is solely a matter of budget. If you are making a war film, instead of paying 30000 extras, you can duplicate 100 people in a computer, thus spend less. You don't necessarily have to build Titanic in order to make a film about it.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    No. This is only to improve the authenticity of realism. The sales do not go up just because there are 3-D TVs. Of course the film audience will prefer 3-D film, but this is for preference not to boost the number of film audience.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Definitely it's an advantage.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

No. Professional work is done with money. Nobody can show the film at theaters if they've made at home. If they want to show them they have to work with professionals.

14.3. Do you think this fact causes a profit concern for professional studios?

I don't think so. Only budgets are getting smaller, as long as job opportunities increase, people continue to make money. Earlier, if they were making 5 dollars in one job, they make 5 dollars in 3 jobs now, gaining from demand. The only difference is that working hours have increased.

Appendix XIII

Interview with Perran Yavru (1983) – Programming Coordinator at Fox International TV Channels.

1. **For how long have you been working on post-production sector?**

   For 3 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   Around 5000.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   90 %.

4. **Have you ever used traditional editing techniques?**

   Yes.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   Contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Faster, more practical, easier to use different effects.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   It doesn't lower the quality because it is fast and digital.

7. **Which workstation do you prefer and why?**

   AVID's Media Composer because it is what I am used to.

8. **Which way do you follow the developments of post-production technologies.**

   Forums.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   Yes.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    Yes. Websites, forums, and any other social media related to cinema.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    Sometimes.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    No, I don't think so.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    No.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.**

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Yes.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

No.

14.3. Do you think this fact causes a profit concern for professional studios?

No.

Appendix XIV

Interview with Umut İsan (1983) – Sound Engineer and Designer of films and TV series such as "NEFES: Vatan Sağolsun", "Behzat Ç.; Seni Kalbime Gömdüm", "Behzat Ç.: Bir Ankara Polisiyesi".

1. **For how long have you been working on post-production sector?**

   7 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   I cannot give an exact number, maybe around 1000 or something like that.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   Nearly 100 %.

4. **Have you ever used traditional editing techniques?**

   Yes but as a part of my education.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   I would prefer traditional systems, however considering the current situation of the business and the availability of such systems it is nearly impossible to work in traditional systems. In Turkey there may be 3 or 4 studios left that can provide such systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   The most important factor is speed, and also the number of possibilities and options. The most important aspect of contemporary systems is that they provide nearly the same result in seconds rather than hours so the time element is an important factor. The second important factor for me is the ease of retrieving, re-producing or duplicating previous result. I can take any previous projects that already finished from my backups and use the existing material to create new

material or use certain results that has been used in previous projects on a project at hand. Also it is much easier to open the same project in different studios with similar equipment. The final reason is the broader spectrum of possibilities which in return supports creative workflow.

5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

I may not be able to work with such systems before except my education but what I know as a fact is that traditional systems give more organic and more realistic results. At the end of the day digital work flow is based on 'sampling' of the original stuff.

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Contemporary techniques are based on mostly time saving so the basic advantage can be said as efficiency. Also it is easier to get the desired results with less steps or trials. On the other hand traditional systems are more accurate, needs very precise adjustments and most of the time you cannot undo an action or you cannot correct an error easily.

7. **Which workstation do you prefer and why?**

   Pro Tools because of factors such as ease of use, precision, reliability, intuitive user interface that enables me to work like I am working on real equipment.

8. **Which way do you follow the developments of post-production technologies.**

   From the Internet or from my colleagues.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   I believe we should divide the cinema audience into two. The first group goes to cinema because they want to go to cinema the second goes to cinema because that

day is their off-day and they went to this big mall as a family and they just decided to go to cinema at the end of their mall-exploration trip. What I think is that the number of the first group may not effect from such opportunities of contemporary life, in fact many member of the first group buys DVDs for watching a particular film they have seen on cinema again. On the other hand the latter group may be decreased or may be not but I also believe these people should not be considered as cinema audience.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    No.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    No.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    I think all these effects have their own capabilities and draw-backs which means that if the material you had before post-production has already matured enough it is possible to create legendary scenes with the aid of such effects. On the other hand if the material is not well prepared or not strong enough to affect people than no one can even remember it after few months later regardless of the success of effects or such technological tricks involved.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

I believe every new improvement, every new technique used especially in cinema or TV has an underlying goal to increase the box-office numbers or ratings, so my answer is yes.

14. As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

It would be pointless to deny the advantages of such compact and relatively inexpensive technological tools being available to people. I believe many important names of cinema that we will see in near-future are already paving their road to success as we speak with such equipment at their home studios.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

I don't think so because first of all the same equipment and technology made the pro-studios to finish projects faster. This means at a given time period the number of projects done by a given professional facility has increased. The second reason is that the quality of such home systems or semi-professional systems are deliberately limited by their respective manufacturers and systems with full potential of such software cost tens of thousands of dollars which is not a semi-professional league.

14.3. Do you think this fact causes a profit concern for professional studios?

Maybe or maybe not; depends on the studios original customer portfolio and ability to react the new conditions emerging in the market.

Appendix XV

Interview with Umut Uslusoy (1983) – Sound Engineer of film "Kurtlar Vadisi: Gladio".

1. **For how long have you been working on post-production sector?**

   4 years.

2. **Approximately how many people do you think are working on post-production sector at Turkey?**

   If you are asking about cinema and TV series, it is hard to give a number; however for post-production I would say around 300-400 people.

3. **What do you think is the approximate percentage of contemporary editing system users in comparison with general users regarding to this number?**

   Around 95%.

4. **Have you ever used traditional editing techniques?**

   Unfortunately no.

5. **Do you prefer traditional editing or contemporary editing for your work?**

   Contemporary systems.

   5.1. What is (are) your reason(s) for using contemporary editing systems instead of traditional systems?

   Easy to use, in time wise, this situation is a little standardized.

   5.2. What is (are) your reason(s) for using traditional editing systems instead of contemporary systems?

6. **What are advantages and disadvantages of contemporary editing systems in comparison with traditional editing systems in your opinion?**

   Because everything is digital, it is easy to do manıpulations and changes however for analog systems doing changes is very limited.

7. **Which workstation do you prefer and why?**

   Pro Tools 7.4 on Mac G5. Because it is a standard.

8. **Which way do you follow the developments of post-production technologies.**

   Internet of course.

9. **Audience can reach to films more than one way these days. They can prefer buying DVDs or download via internet. Do you think that fact reduces the number of people who prefer watching a film at theater?**

   I don't really think it has a negative effect. A film really successful finds its audience. People still think it is more enjoyable to watch a film in the theaters.

10. **Do you follow the commentary of audience on the works you have participated which have been released? Which way do you follow?**

    We mostly are informed by sectorial data.

11. **Does the commentary of audience have an effect on how you improve your techniques?**

    We don't really have direct information from the audience.

12. **As we know beginning with the usage of computer graphics for films, filmmakers have a wide range of almost ready to use visual and sound effects options. Do you think that situation causes the story strength of films to be of secondary importance?**

    I don't think so.

13. **According to researches more than 50% of audiences have gone to theaters for watching 3-D films for last couple years. Do you think that is a strategy which filmmakers use for taking the attention of audience to theaters?**

    This was the next step for the sector. So I think it got the attention that it deserved.

14. **As a result of technological improvements most of the semi-professional filmmaking equipment have almost reached the quality of professional**

equipment. Also most people own personal computers which are able to obtain the required system properties to install and use professional non-linear editing systems today.

14.1. Is that easy to reach technology an advantage for independent filmmakers?

Absolutely, this situation makes it artistically more attractive.

14.2. Do you think this situation reduce the number of productions produced at professional post-production studios?

Differences between semi-professional and professional systems are more than the half; that is why I don't think it is really possible.

14.3. Do you think this fact causes a profit concern for professional studios?

I don't think it is related to this reason.