CRITICISM OF TECHNOLOGY IN TERMS OF SOCIAL DETERMINISM: PERSPECTIVES OF SCIENTISTS FROM TURKEY

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FATMA KÜBRA GÖKDEMİR

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Prof. Dr. Sencer Ayata
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. Sibel Kalaycıoğlu
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Prof. Dr. Mehmet Ecevit
Supervisor

Examining Committee Members

Prof. Dr. Mehmet Ecevit	(METU, SOC)
Assoc. Prof. Dr.Nilay Çabuk Kaya	(AU, SOC.)
Assoc. Prof. Dr. Erdoğan Yıldırım	(METU, SOC)

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Name, Last name: Fatma Kübra Gökdemir

Signature :

ABSTRACT

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Gökdemir, Fatma Kübra

M.S., Department of Sociology

Supervisor: Prof. Dr. Mehmet C. Ecevit

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Technology conceptualized as a social entity and a relation has attained new meanings and inquired based on different methodological and theoretical standpoints since 1970s. It was widely recognized as autonomous however it emerges and related to social relations and have a 'determining' role on social, economic and political character of societies. The role of technology in transforming scientific knowledge into needs of society is mostly considered within 'pragmatic' understanding. The aim of integrating and questioning the social character of technology lead to critical contemporary discussions of technology.

The goal of this study is to question whether technology is socially shaped and dependent or independent/autonomous social entity. That is whether it is largely external-outside of society, exogenous, supra-social and posses its own path or it is a socially dependent entity. This study thus aims to provide a critical inquiry on technological determinism and the social determinism is examined in the light of in-depth interviews carried out with scientists from Turkey. The social character of technology is related to issues concerning the expansion of capitalist social relations: uncertain, risky and rational.

Key words: technology, social determinism, autonomous, capitalism, Turkey

ÖZ

TOPLUMSAL BELİRLENİMCİLİK BAĞLAMINDA TEKNOLOJİNİN ELEŞTİRİSİ:
TÜRKİYE'DEN BİLİM İNSANLARININ BAKIŞ AÇILARI

Gökdemir, Fatma Kübra

Yüksek Lisans, Sosyoloji Bölümü

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70'lerden itibaren teknoloji yeni anlamlar kazanıyor. Bu süreçte teknoloji toplumsal bir oluşum olarak kavramsallaştırılırken metodolojik ve kuramsal olarak farklı bakış açıları tarafından ele alınıyor. Önceden, teknoloji toplumların iktisadi siyasi ve toplumsal özelliklerini belirleyen konumuna sahip bağımsız bir değişken olarak değerlendiriliyordu. Teknolojinin rolünün faydacı bir anlayış içerisinde bilimsel bilginin toplumun ihtiyaçları doğrultusunda değiştiği düşünülüyordu. Teknolojinin toplumsal özelliğini bütünleştirme ve sorgulama amacı, teknolojiye ilişkin güncel eleştirel tartışmaları doğurmaktadır

Bu çalışma teknolojinin toplumsal olarak şekillenip şekillenmediğini ya da bağımsız bir toplumsal varlık olup olmadığını sorgulamayı, başka bir ifade ile teknolojinin, bağımsız bir varlık olarak topluma dışsal, toplumsalın üstünde, kendine ait bir yönü mü olduğunu yoksa teknolojinin toplumsal olana bağımlı bir varlık mı olduğunu sorgulamayı amaçlamaktadır. Bu çalışmada teknoloji belirlenimciliğine eleştirel bir bakış açısı getirmek ve Türkiye'deki bilim insanları ile yürütülen derinlemesine mülakatlar ışığında toplumsal belirlenimciliği incelemek

amaçlanmaktadır. Teknolojinin toplumsal özelliği kapitalist toplumsal ilişkilerin genişlemesine ilişkin konularla bağlantılıdır: belirsizlik, risk, rasyonellik.

Anahtar Kelimeler: teknoloji, toplumsal belirlenimcilik, otonom, kapitalizm, Türkiye

To mother; Kadincimcime

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LIST OF ABBREVIATIONS

SCOT	: Social Construction of Technology
ANT	: Actor Network Theory

CHAPTER I

INTRODUCTION

This study aims to analyze, by in-depth interviews, the issue of shaping of technology by social relations within contemporary debates over technology. The goal of this study is to argue whether the technology is socially shaped and dependent variable or autonomous that is largely external-outside of society, supra-social or exogenous and posses its own path and develops independently of social relations and independent variable. In fact this study enquires into technology to provide a critical perspective on the technological determinism in the light of the in-depth interview with scientists.

The study also focuses on the relations between technology and society that is shaped through social relations within the current capitalist system. The study puts in perspective the technology as it is socially determined by arguing that the issues concerning the expansion of capitalist social relations over the technological apparatuses have power to drive the social change and technological change is inevitable. The new technologies are occurred within the consideration of the social needs or interests and social position of social groups that can be constituted by the social political and economic sphere. Although the meaning attributed to technology is neutral and autonomous as a force of efficiency, rationality and progress in general, this study will follow the traces of evidence in the light of field research and has endeavor to reveal the social relations embedded into technology in the processes.

On the other hand, my goal with choosing the in-depth qualitative interview method is to understand the scientists' view on the existence of technology as socially dependent in Turkey. For this reason the in-depth interview seems especially an appropriate method for delving deep into issues, and challenges and captures the "whys" behind interviewees' reactions. The in-depth interviews that are conducted with 20 scientists contribute to put forth the social relations embedded into the technology in peculiar to Turkey.

Briefly, this study argues that technology is socially dependent in the sense of current capitalist system. . The literature on the technology with respect to my argument includes the empirical turn constituting the evaluation of technology in modernism to postmodernism. This study takes the criticism of modernity into account on the basis of critical theory. There seems no way to develop

good theoretical pictures without noticing the difference between 'technology as socially dependent' and 'social construction of technology'. In the similar vein, two conceptualization of technology displays the common touch that is relied on the social world and privileged the social relations rather non-natural or non-human forms of construction. Although the ideas of social construction and the classical sociology from analysis by Marx, Weber, and Durkheim have common origin of thought, the social construction of technology seized upon the empirical program of relativism in the social studies of technology rather than the realism (Sismondo, 2004: 52). In this sense, this study embraces a wide range of issues concerning technology and it cannot be benefited from the method of relativism and the technology is evaluated in terms of social relations as a critique to capitalism.

This thesis is composed of five chapters. The first chapter is a brief introduction to the subject. It presents the method of analysis involving the assumptions and the research question and the research sample to explicate how the study is carried out.

In the second chapter, the conceptualization of technology is introduced and the change in the conceptualization of technology is presented in harmony with the development of social theory. Among the themes in the social theory that came to the fore, none was more significant than the relationship between technology and its dependence on the social relations in this study. This is not all new that the umbrella debate is shaped around the social dependence of technology rather its autonomy position as claimed. The chapter begins with explaining the meaning of technology and touches upon the history of technological development briefly and the reflection of technology on the theoretical debates on the modernist and postmodernist perspectives in the social theory. It is tried to explain the feature of contemporary capitalism in terms of technological domination. The technology's power is marked as the major agent of social change in the modernity.

In the third chapter, dependent and autonomous characteristics of technology are evaluated in the light of interviews. The technology was assumed as rational, independent, self-controlling, self-generating, self-expanding force but now technology is rather exposed to social relations and reconstructed through this relationship.

This part attempts to clarify that the position of technology can be related to the power, inequality and cultural differences. The human intervention is related to the emergence of new technological development that alters the description of society such as knowledge society, network society, information society, etc. The different characterization of society with technological attributes can imply that technology is autonomous.

This chapter discusses the manipulation of culture through the capitalism and technological advancement. The sustainability of capitalist system is provided by mass culture in which technology is powerful instrument for social control and domination. In this chapter it is worth mentioning the technology is becoming a major force of production and mode of social organization and control. The obtained data from the field research is interpreted by means of Frankfurt School and Foucauldian analysis. In addition this chapter consists of one subheading that discusses the relationship between the technology and social sciences in a critical way.

The final chapter focuses on the relationship between global capitalism, social inequality and technology. First, it discusses the the dynamic characteristics of technology; rational, contingency, uncertain, unforeseen. In modern terms, technology is assumed to be rational, neutral and have foreseenable results. In other words, technology provides the increase in control of society by different means and these kind of social relations do not leave any gap for the ambiguous or uncertain conditions but the technology can treat as in an irrational way that includes the uncertain or unforeseen characteristics to pose a threat against the society.

The Enlightenment thought of rational society can be revaluated on the basis of unforeseen results of technology. The control histeria of modernity and uncertain, contingent characteristics of technology are in a contradictory position. This chapter discusses this contradictory position in the light of interviews. The questioning dynamic characteristics of technology carry on the criticism of modernity and the cultural dimension of modernity. The other part of this chapter examines the global capitalism and capitalist relations in Turkey that embodied labor, the contradiction of labor vs. capital, a kind of imperialism, global capitalism, international relations, and multinational formations. The major discussion points of modernity discussion are around the control of time, space and globalization. The new technologies bring the increase in leisure time and the control of time is important for examing of expansion of capitalist system in the global level. In addition, this chapter explores how the relationship between the social movements and technology is seen as co-evolving through the social sphere. The wide-reaching social movements comprise the contradictions of capitalism and technology provides the alternative way of resistance.

The other subheading is referring to the gender inequality. It becomes obvious by means of penetration of technology into social relations. The technology constructs the hidden disparity between man and woman. The technology has immanent aspects of patriarchal relations and capitalist relations.

1.1.Method of Analysis

This paper presents qualitative method used to understand and interpret social dependence of technology by assuming its changing position within the context of the capitalism.

The qualitative research is conducted by means of twenty interviewees. The interviewee group is comprised of four of expertise; economy(e), three of expertise; sociology(s), five of expertise; engineer(en), four of expertise; communication(c), two of expertise; labor economics and industrial relations(l), one of expertise; gender(g), one of expertise; technique demography(td). These parenthesis such as (s), (en), (c) is referring to the expertise of each interviewees. For instance, the (s_1) indicates the first interviewee of sociologist; (en_2) implies the second interviewee of engineer scienctist in the study. The age range of interviewees is 30-50 and one third of interviewees are woman. The interviews lasted between 45 minutes and three hours. In the field, the first two interviews have been planned as pilot study to reformulate the questions of study. The same questionnaire is applied to the interviewees from different disciplines. Some of the questions could not be responded easily by the interviewee because of this interdisciplinarity. The order and structure of questions are revisited and the additional questions emerged to overcome the problems experienced in the field.

In the beginning of the field research, it was tried to make an in-depth interview with social scientist that deal with the study of technology. The number of social scientist is inadequate to capture and discover the meaning that immersed the data on the issue of technology. For this reason the engineers were included into the study. Most of the engineers, participated in the research, deal with the social field of technology such as the history of science and technology, innovation economics, etc. During the research sample, the snowball sampling technique, which existing study interviewees find the future subjects from among their acquaintances, has been used to access the interviewees, scientists who concern with the social relations of technology.

This study has developed a critical view on the technology in relation to the social inequalities and capitalist relations. On the other hand, the social theory has been profoundly challenged by post-theories embodied post-humanism, post-structuralism and post-modernism. Contrary to the standpoint of these post-theories, the unit of analysis is ‘human’ in this study. Although the debate on non-human and cyborg has been included in this study in the light of the interviews and literature, I focused on the social relations, and the human. Focusing upon the interviews on the technology and its relations with societal is clear. The distinction between human and non-human/cyborg is manifested by the transition from the modern to the post-modern. The social sciences have empirical and theoretical focus on human and its relations with other humans and the social structure. But the contemporary theories’ account of the subject indicates that there is a shift

in their unit of analysis from humans to cyborgs. The reconceptualization of humans as cyborgs leans on the technological advances contributed to a growing uncertainty on the arising of subject. The growth of advances in transplant surgery, fertilization and genetic engineering contributed to control over bodies more. The increasing control over bodies manifests the weakening boundaries between bodies and machines. (Shilling, 2005: 4) Even human being is not embodied just only human but also non-human. For instance the heart pacemakers' insertion as endo-cardial implantation refers to the non-human or mechanized bodies arisen from the technological advancement in recent years. These are contrary to the enlightenment thought developed around the individual freed from the repression of society and traditional ties. The freedom of individual should be relied on human reason and logic. In this study the unit of analysis is human rather non-human/cyborg. The analysis of study is still conducted through human. The social relations are major tool of analysis for this study.

On the other hand, it should be admitted that there were many different difficulties to analyze the data as consequences of interviews. The time limitation, the number of interviewees, and the nature of knowledge obtained from the field are the real challenge of this study. In addition, the wide scale of perspectives and ideas forced me to put limits to the extent of discussions. Some irrelevant parts in the interviews were intentionally removed by taking the goal of the study into account.

The study on technology seems to be conducted by the natural sciences, however; in recent years, there is increasing interest of social sciences on this issue. It is possible to say that the reflection of technology on the classical social theory is not found in great details. The technology is often related to the process of modernization and capitalism in the classical social theory. The technology studies has been become more varied through the economic and political sphere to cultural sphere. The recent literature addresses to the technology under current evaluation by postmodern theories. Actually, I think that my sociology background helped me to make easier the evaluation of the technology in accordance with the social relations. However, I had some trouble to comprehend some issues specific to different fields of technology in the literature.

The study takes a variety of critical position to the autonomy of technology in the light of interviews. Debates on the autonomy of technology and the social dependence of technology have increased and the technology related to this context legitimized its importance in the literature. In addition, the interpretations of technology as socially dependent are various and complex and there are claims, theories, facts on this issue. I do not claim that this study is complete and cover all theoretical approaches on this issue.

CHAPTER II

AN OVERVIEW OF TECHNOLOGY

This chapter consists of literature review on technology. The meaning of technology, a very short history of technological development and change in conceptualization of technology in social theory are examined in this chapter.

Although the study of endeavor in technology seems related to the natural science rather than the social science, in last twenty years, the increasing interest of technology in social science indicates that the question marks keep appearing in our minds more on this issue. These are times of vast social change. The transformation of information, the processes of globalization, knowledge society and large-scale cultural influences have arisen. After the World War II, the technology has been considered as not only a tool or an instrument but also it has strong political and social implications that increased surveillance and commoditification and also leads to ecological degradation. In other words, the risky and ambiguous characteristic of the technology had been arisen by means of the strong emphasis on the political and social implications of the technology in the World.

The main problem of ethics on technology had also emerged in these days since the technology poses a serious threat to the civil society. Some of the technologies and its consequences such as nuclear weapons, the atom bombs, the mad cow disease, the genetically modified organism, can be perceived as the unintended consequences of technology that lead to the prevalence of anxiety among society. However technology has also served up the solution to epidemic disease, the packaging and dissemination of information and etc

.

2.1. A Brief Historical Overview of Technology Development

The technological innovation held a prominent position in history. Nowadays it is unprecedented technological progress, the ability of machines improving themselves with using of artificial intelligence that is addressing to human cognitive process and the philosophical problem of mind versus body. It has ability to cognize the process as human beings' intelligence (Heffernan, 2000: 105). The characteristics of past trends in the technological innovation give us some clues on the change in sociological perspective of technology. The historical development of technology has

been explained by reference to western history in which the renaissance period contains the technological innovations that are mechanical clock, the full-rigged ship, fixed viewpoint perspective, global maps and the printing press(Carlisler, 2004: 18).

The technological innovations were made in the field of metallurgy, chemical technology and mechanical engineering with the emergence of industrial society in the eighteenth century. The scientific discovery and technological invention in the historical period can not be considered independent of the chronological order that allow us to mark the progress in definite periods. Especially after 15th century, the Ages of Scientific Revolution 1600-1790, the Industrial Revolution 1791-1890, the Electrical Age 1891-1934, the Atomic and Electronic Age 1935 into 21th century (Carlisler, 2004: 15).

In addition to that new technological progress is called Third Revolution. Especially, the technological progress in artificial intelligence and the cybernetics are used to strengthen the assertion of third revolution in technology. The focal point is not to give the chronological emergence of technical development but rather the problematization of technology and social relations that are formed by the discussion of autonomy of technology and society.

The increase in automation of production and the use of computer and new technological developments in biotechnology are the key ingredients of the change to understand the new social trends and transformations in last years. When the historical progress of technology has been examined, the centrality of technology is the first commencement to develop a theoretical framework for its irrevocable separation from the social change.

This study tries to discuss the conceptualization of technology in relation to the social theory which can be centered on the separation of time/space, the autonomy/dependent characteristics of technology and the unintended consequences of technology.

Before examining the theoretical aspects of technology, it has been described as a tool that basically focuses on the instrumental facet of it. But technology or machines have instrumental functions that are differentiated from tools. Mumford explains this distinction between tools and machine in which the user directly manipulates tools when machine are more independent of the skill of the user (Dusek, 2006: 31).

2.2. The Meaning of Technology

The essence of technology lies in the study of the etymology of technology. This concerns the root of the word and the meaning of it gives some clues on the relationship between the reason/rational

and the technology. Technology as a word is originated from the Ancient Greek word tekhne, meaning is art and craft. In modern phrase, the meaning of technology is used as instrumental aspect that is implied the word 'craft' (Edgar and Sedgwick, 2003: 404).

According to Platon, the real *tekhne* (art) is operated by artisan, knows how it is done and explains this activity in a rational way (Güçlü, Uzun and Yolsal, 2002: 1406). The explanation of the artisan's activity in a rational way is important issue for the reflection of technology on the modern times.

The rational way of thinking celebrated the technology's modernizing feature and the construction of various technologies is occurred within the modernity. For this reason the role of technology in modernity and the critique view on modernity and technology will be found systematically in this study. From a critique to modernism, Foucault (Grampton, 2003: 15) supposed to techne as a practice and is not restricted to the modern sense of word 'technology'. Techne has the sense of producing or production of something. The technology of the self is related with the production of the self. Foucault mentioned the relationship between the technology, production and self scerned from the modern episteme that focuses on the rationality, science and technology. In this sense, the rationality and modernity bring to mind a linkage of the science and technology.

At first technology is often seen as part of science even technology may be accepted as the consequence of science. Other reaction has been manifested as the inseparability of science and technology that interact in whatever manner in a new form. Sismondo defines technology that unified the scientific method within practical and creative minded (2004: 9). Moreover, Dewey agreed that science is simply theoretical technology and all rational thought is instrumental, sees technology as applied science. On other debate, technology has deep-rooted past in history of the humanity that contains the Neolithic period in which technology is the production of rock, cutter and axe. On the contrary, Science as a term belongs to 19th century means controlling and shaping the nature (Bassalla, 2004: 36). This debate on the technology comes from science and vice versa is a vicious circle that the historical development of the technology can not be interpreted without scrutinizing the relation between science and social structure.

2.3. Between Time and Space

The philosophy of the technology is begun to address the time and space during the much of the twentieth century. Especially the regulation of time and the technological control of time have placed important agenda on the existing condition of modernity. If the technology has been the catalyzer of the modernity, we can say that the existing modernity is shaped by technology.

Technology can be taken as a result of modernity. But the contrary may also be possible that modernity is shaping and driving technology, an integral part of the system of production, institutions, economic system and culture (Brey, 2003: 33). This discussion has been continued by different perspectives towards technology. The examination of time and space can not be separated from the discussion of modernity including the general manner to twentieth century.

Conceptualizing time can be difficult not to realize the differentiation of the time and our perception of time. Our perception of time has been put aside in the examination of modern understanding of time. The differentiation of our perception of time represents the new social transformation and the structure of the modern world.

As a standard concept, time, a measuring system to sequence events, has been changed through the invention of the clock. The impact of this improvement has been explored to get the picture of the ability of manipulation of nature and impacts on social world.

One of the important functions of the clock is to organize the actions and relations with nature. Lewis Mumford agreed that the clock is the key of the machine age and this key has an impact on life of human being (Sismondo, 2004: 8). Because it provides the system of measurement, the standardization of time and the calculation of day/night become possible. Before the invention of the clock, nature that is human or animal muscles, water, wind as external and unreliable were used instead of clock. For instance Egyptians accommodated near the Nile River because of the need for water. They irrigated their lands thanks to the Nile River. They improved the irrigation technique within mathematical aspect. The farmers recorded the season of rain and fasten down the need of water of land. When the rain seasons provided the flood of Nile River, the Egyptians make fertile for growing crops. The rainy seasons and the study of astronomy were vital to provide the calendar information. The systems of taxes, administration were regulated by the help of this calendar information. The standardization of time brought the historical development in agriculture. The nature plays a deterministic role to control time before the invention of the clock.

Simpson argues that the clocks are inevitable mechanisms for modern technology. It provides the coordination, comparison and increasing control, and harmonizing the processes and improving the efficiency of production (1995: 7). The existence of the standardization in time accelerates the development in agriculture and triggered the creation of new technologies.

In this part of study, the question ‘what the relationship between the space/time and technology is taken up more implicitly. The separation of time and space was discussed by many philosophers. Kant used the notion of the separation of time and space in the modern sense. There is a fundamental split of modern between the subject (internal), object (external) and between the

things within themselves (noumena) and we sense the things and know them (phenomena). There is radical rupture between human and technology by this distinction. According to Kant, you can not have a space of cognition; ideas can not crossed our minds in spatial relations but it crossed our minds one after another in sequence- in time. For this reason space is external but time is internal, time is seen as primary (Wise, 1997: 4). It can be considered that time has more privileged position than space and technology has a desire for controlling the future within using time restriction.

The perception of time has differentiated as the consequence of information and communication technology Castells introduces new concept 'timeless time' would emerge where the sequential activities that characterize the linear time were cut in by the cross-connections between activities. These activities accompany with our network society(Kingma and Boergma, 2002: 2-3). In other words timeless time enables us to be in different places at the same time. For instance the internet (World Wide Web) can provide the increase in the number of activities that can be participated at the same time and at different places. This conveys the transformation in spatial structure and time. For Castells, this transformation includes a new form of space, the space of flows. The space of flow is electronic circuits and information system but it is made of territories physical places whose functional or symbolic meaning on their connection to a network rather than on its specific characteristics as localities (2000: 695).

The timeless time and space of flow are directly connected with the expansion of telecommunications, fast transportation and the development of information systems. Castells considers the network society as dynamic and open structures. But Urry have an objection that these structures include the flow of people, images and information but also new inequalities of access/non-access of particular societies. Especially this condition produces the emergence of new hierarchies and the new forms of class relations (Gane, 2004: 112). It is also crucial that the new hierarchies lead to deepen the unequal positioning of countries that are determined by level of the technological development. The development of technology come to be seen as deriving from the West, this can manifest the increasing centrality of technology's production that come out of the unequal relations with the Third World. It is difficult to overlook the technology as a chief agent of change and this condition creates a gap between the producers or just only consumers of technology of countries. The development of science and technology appears to lie in the Western Thought. Some scholars recognized that this claim has to be interrogated to demonstrate constructing the science and technology history as a result of the interaction of East and West. This biased perspective has complicated to understand the idea of progress of technology. Nevertheless McQuire noted a related shift that the industrialized West lost its superior position in the leadership in technological production. In the 1980's Japan was a rival to Industrialized West in the field of electronics and microelectronics. The Asian tigers are the new rivals of the Industrialized West and this condition changes the map of global technology emerged in the world (2006: 261). For this

reason, industrialized West loses its hegemony on the technological production in the global market.

In this chapter, it has attempted to give the descriptive examination of technology in the first part. In this part, the technology become the major themes of post-discussion in the literature and the changing conceptualization of technology and relation with the social relations has been combined with the social theory and contemporary discussion in multiple ways.

Technology has autonomous characteristics. This suggested that it somehow determines every aspects of society and shapes the economy and differentiation of the power. Hitherto, sociologists neglect the analysis of technology and social science does not have adequate study on it. Technology was evaluated as exterior factor in the field of social, political and economic sphere. But this view is criticized by which technology is constructed socially and is dependently shaped by social conditions.

On the other aspect that technology and science involve objects, representations and creating situations in which humans and non humans affect each other. When we put the discussion of the autonomy of technology on the sideway, the post-modern critique focuses on the transformation and commoditification of the culture within the technological development. In this study, we examine the three aspects of technology and the contemporary critique to modernity and technology is able to tell the whole story of the development of social theory on this issue.

2.4. The Classical Approach to Technology

When tracking the autonomous characteristic of technology in the social theory, Marx is key thinker on the neutral conception of technology. The isolation of technology from the social relations or the technology over social relations can take place in Marxian analysis which point out the reproduction of surplus value depending on the increased speed of production by using new machinery. In the literature this interpretation is referring to the technological determinism which Marx's analysis has been stigmatized as merely. But this view can be described as Marxian analysis of technology influenced by prejudged perspective. In this sense, this attempt is necessary to examine the Marxian analysis on machine in a detailed way. In mid-late nineteenth century, the dichotomy of machine and worker has been so obvious within the industrial production that the improvement of machine leaded to the decrease in labor time in the short instance.

In Marxian sense, the machine technology possesses decisive position in productive process that is directly related with the dynamics of capital accumulation and the worker's experience of productive activity. The position of labor has changed independent relation into interdependent

relation with machine. Especially, human labor is different from animal labor that is bound to genetic code of the species. The integration of human labor to automated system is not as easily as it is predicted. There are some results from the integration of human labor and machine. The integration of organic labor into automated system decreases the time that gives possibility to a greater proportion of the day for surplus value and the devaluation of labor provides the general cheapening of commodities and inferentially, the subsistence level of worker has also goes down

The capital accumulation has changed as a result of producing more and selling at lower and lower prices. This can give rise to crises for over-production, under-consumption and unemployment about which Marx mentioned in his writings. The capital accumulation has taken into account the competition between different levels of technological development in making the production. In other words, the capital accumulation plays a key role in free market competition to keep reinvest in new technological means of production (Abbinnett, 2006: 67). Technology enables to maintain the position of being competitive in the market. The production time has shortened and the increase in number and variety of products has changed the worker's life.

In Marxian analysis, the technology is the forerunner of the capitalist production and industrialization. The motor of force of history is the development of technology and the productivity that revolutionizes and transforms the society (Mac Kenzie, 2001: 144).

Moreover, there are many representations of machine in Marx's text. For instance Communist Manifesto emphasizes the revolutionary influence of technological innovation in manufacturing, agriculture, transport and communication. Capital includes the destroying social affects of machine production and the factory system on worker. The main issue is the political control over surplus in Marxist analysis that is constituted by the structural division between the forces of production and the relations of production. That division made, favors a relatively neutral conception of technology (McQuire, 2006: 255-256). The neutrality of technology can be demonstrated the independency in machines from human intervention in the production process. In the preface of the Contribution to the Critique of Political Economy by Marx, he has emphasis on the historical materialism that the real base is the technological development that determines mankind's ideological development, the superstructure that is law and morality religion and art philosophy and science. Technology takes priority over ideology (Axelos, 1976: 143). The organization of labor, the production process and the labor process are determined by the technological development in the industry. The historical change in development of technology has been pursued as determining actor to organize the labor process and the mode of production. The development of industrial technology increases the production more at cheaper prices and it gives the possibility to make a mass production of goods. The efficiency of production and the labor time can be combined with the development of automatic that leads to diminish the labor time and the increase in production. Marx argues that the

aim of the improved machinery is to lessen manual labor, to provide for a process or the completion of a link in a manufacture by the aid of an iron instead of the human apparatus (Mackenzie, 2001: 156). The characteristic feature of our modern mechanical improvement is the diminishing of the labor time. In the Grundrisse, Marx added to that the realization of fixed capital is the machine. The machine is differentiated from tools because the machine affects the autonomous activity of the worker into an objective power that determines the process and temporality of production (Abbinnett, 2006: 65). The machine merges with the human labor in the beginning of the industrialization. But to what extend machine substitutes the human labor is a considerable question that is connected with the level of technological development and the intervention of technology into our work life. In contemporary society, the relationship between the human and machine has unaccountable results to interpret the anthropoid-machines.

> In acquiring new productive forces men change their mode of production and in changing their mode of production in changing the way of earning their living, they change all their social relations. The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist. Marx (Axelos, 1976)

Marx has given an emphasis that the technology has changed the social relations in accordance with types of production. In the text, he constituted machine, used instead of technology, that the change in labor especially labor process and the devaluation of labor are the negative conception from that angle. Nevertheless, Marx predicts that technology has a central and positive role in communist society to provide people with free time and it provides people to cultivate their talents and develop as free, social individuals.

By the improvements in mechanics, the labor process has been changed drastically and the view of the autonomy of technology has become stronger within the debate over labor. But the Marxian analysis of technology has been interpreted as technology deterministic by some thinkers. Especially they criticized that technology has autonomous character to shape the social relations and technology is over to figure out the dominant factor in social change.

Mumford argues that Marx concedes technology as central place and directive function in human development and Mumford added that technical forces evolved automatically and determined character of all other institutions (Bimber, 1990: 334). These arguments about Marx and technology tend to emphasize the technological deterministic way of thinking. On the other hand, Miller argues that Marx was no technological determinist because of the work relations as independent force in history. Rosenberg claims that the historical change is seen as social rather than technological process by Marx (Bimber, 1990: 334). MacKanzie argues that the forces of production should not even up technology. The chief parts of the forces of production are human not technological (Bimber, 1990:336). The economic logic of progress can contain technology but

it is neither dependent on nor determined by technical factors. The technological determinism of Marxist analysis has remained ambiguous as the origin of discussion. In the article of Bimber divides technological determinism of Marxian analysis into three faces that Norm Based Account clarifies the technological determinism as a chiefly cultural phenomena; Unintended Consequences Account view perceive the technological enterprise in terms of unexpected social outcomes. The Logical Sequence Account view claims that the primary factors in the development of the forces of production are human (1990: 333). Human includes arousing of self-expression, resistance to alienation and expanding needs. Norm-Based Account of technological determinism clarifies that there is the absence of willful control over technical practice; the goals of efficiency and productivity come into question instead of ethical norms and it constitutes the control over technology without social values. (Bimber, 1990: 337)

For Ellul argues that technology is the domination of social, political and economic life targeting to the goals of logic, and efficiency. Ellul indicates that capitalism could not create our world but machine could. From now on technique provides an evolution that is transformed and is being progressing without any decisive intervention by human being (Bimber, 1990: 337). In the short instance technology can replace the human labor and it can have hegemony on the control of human labor in the free market. Human being internalized the hegemony of technology and they can not resist or struggle against the desire of control of technology.

For this reason the description of the technology has modified and the de-humanized conceptualization of technology is prevailing over dependency of technology today. According to Lewis Mumford (Sismondo, 2004: 9) technology can be divided into two parts. One of the parts is that polytechnics are life-oriented and cooperating with human needs. There are existing tools, which is manipulated in a more functional way by using polytechnics. Another part is mono-techniques produce mega machines that can increase power dramatically but by regimenting and dehumanizing. (E.g. computer, cyborgs) Today the technological change is so rapid and profound that the mega-machines can be found through analysis of trends which can not be irreversible and out of the human control directly. The autonomy and the unintended consequence of technology will be prevailed without the domination of human-being.

In addition to Mumford's caution about the dangers of mega-technic that Marcuse's description of the one-dimensional life of technological rationality can be taken as a clue for the emphasis on the autonomous state of technology. All of these ideas are arising with the Habermasian question that has society adopted a hegemonic cultural mind-set which limits discourse and judgment to matters of logic, reason or productivity. (Bimber, 1990: 337) Habermas stresses cultural determinants such as norms, values and social practices in technological progress.

This manifests that the arguments support the cultural aspects of the technology and it is capable of lightening up the debate on the origins of technology determinism and proponents of the other arguments.

The other technological deterministic view by Bimber's separation is the Logical Sequence Account that Cohen takes machinery and sub-human power that function as the independent agencies of history. Technology itself applies causal influence on social practice.
The evolution of technological change in the social structure is naturally given and what people thought or desired is not essential for the posterior development of society. The technological development is naturally given logic which is not determined by social and cultural factors. Heilbroner develops this idea that technological developments assign the evolutionary path over which society must travel. Heilbroner argues that the development of the hand mill to steam mill has not been emerged by chance. Thus this path is naturally given and acts upon social development independently. The scientific laws predetermine history. (Bimber, 1990: 338)

The third approach is to explain technology and social change through a technological deterministic view that concentrates on the unintended effects of technological development. These effects emerged unsought and uncontrolled within the development of new technologies. The technological outcomes are independent of human will and this account does not depend on laws or pattern which is Logical Sequence Account is based. (Bimber, 1990: 339)

The assertion of technological determinism of Marxism has been explored and the real significance of this discussion is core point how the technological change has occurred through naturally given or cultural phenomena and have unintended results.

On the other hand, there is a noteworthy theoretical differentiation which includes the challenge ideas of rationality and irrationality, leads to provide our understanding between reason, rationality, capitalism and technology.

The concepts of rationalization and modernity go hand in hand to depict the existing social relations. Modernity is the historical condition, referring to the universal characteristics of objective science, definite cultural forms and the epistemological standpoint. The application of objective rules, the efficiency and the calculative principle in the social relations are embedded in the rational society. It can be considered that the rationalization process guides the development of capitalism and the technology. In this context, Weber's major works are essential to deal with the rationalization, the development of capitalism and bureaucracy. In what context technology and rationalization is relating? Weber argues that the modern economic order is bound to technical/economic conditions of machine production. These conditions determine the lives of

individuals directly. The process of economic rationalization of modern capitalism and irrational value commitments are connecting with the decoding motives behind the technological change(Clarke, 2006: 18). For Weber, the change through human action, human subjects are motivated in certain ways for differing reasons. The spirit of capitalism is constituted by the motivational structure of action. In this respect, human beings are not passive objects by impersonal forces. The change in technology is not dominated by the economic system but human actions enable them to affect the social change in the long instance. In addition to that Weber sees the reason of domination of man over man as a fate and technical reason may be used to enslave us or emancipate us in accordance with the way in which it is used. The role of the human and the enslavement of technical reason have some philosophical implications on the discussion of technology.

Frankfurt School has implied the critique of technology that is an attribution to the negative essence to technology, perceives it as the force of domination, control and exploitation. Contrary to the arguments made by Weber, Marcuse (Clarke, 2006: 23) argues that the technical rationality is ideological and can be freed from human actions deliberately. Technical rationality is dominated by market which is determined by political and economic monopolies. The technological improvements in computing communication and internet expanded the hegemony of western market in the global world. For this reason, the machine is not neutral; it is leaded by ruling and political interests. Marcuse's analysis focused on the market relations with political interest that is an answer to these questions; who owns the technology, benefits from it and who decides?

The Frankfurt School that pursued the discussion on technological change to create the power relations, has criticized the neutral understanding of technology. Heidegger and Adorno (Feenberg, 1996: 45) illustrates this view that instrumentality is a form of domination in itself. This domination controls objects that violates their integrity, suppresses and destroys them and so technology is not neutral and simply using its instrumentality. It contains a taking a valuative stance. This view also advocates the non-neutral technology and this non-neutrality contains the values, preferences and potentialities.

Instead of Weber's emphasis on market and bureaucracy, Heidegger stressed the technology and his iron cage is a system of research and development, a techno-science. He added that techno-science essentially restructures the reality in a path. This path reveals its intrinsic potentialities and exposed it to domination in service to subjective ends. This domination brings up the destruction of both human and nature. Technology is radically alien and hostile and enframed the World. Techno-science is dangerous than rhetoric or markets. (Feenberg, 2008)

The term ‘techno-science’ has a priority for Heidegger’s analysis to explain the value-neutrality of technology. The danger emerges when the modern technology dominates and suppresses our life. Despite of this danger, Heidegger split the modern technology into two patterns. This emphasis is not placed on the straight-line instrumentalism, but he sees the modern technology as a “challenging’’. Modern technology as a challenge puts to the nature unreasonable demands that it supply energy that can be extracted and stored.

The other pattern that the modern technology is as a form of revealing is an attempt to unlock, transform, store, and distribute the resources that nature has to offer. In this respect, the nature has been threatened as standing reserve. On the other side he claims that man is not transformed into mere standing-reserve. Besides, the standing reserve is associated with the idea of "instrumentality". The instrumental position of technology transforms the world into standing reserve. Technology is not good in itself but it is good for something/somebody. In other words, technology is useful to others. For instance internet has no value and meaning in itself but internet, as a means of communication, is valuable for humanity and has a profound impact on the transformation of society. (Godzinski, 2008) His focus where it needs to be on the negative essence of technology as domination in service to subjective ends and the connection between instrumental view of technology and the domination of nature. The value-stance aspects of technology precede the interrogation of the modernity.

On the Contrary, Habermas’s approach implies that technology is neutral in its proper sphere. Taken as outside the sphere, it leads to the various social pathologies which may be considered as chief problems of modern societies. He evaluates technology as a generic project, a project of the human species as a whole not of some particular historical epoch like class society or of a particular class like the bourgeoisie. But Habermas accepts that technological development is influenced by social demands but it differentiated from the notion according to the variety of technical rationalities. (Feenberg, 1996: 48) In short, Habermas as in Weber, scientific-technical rationality is non-social, neutral and formal , it excludes the social .It is neutral therefore it stands for a species-wide interest and a cognitive instrumental interest which neglects the specific values of every sub-group of human species. Science and technology are not essentially responsive to social interests or ideology but only to objective world that they stand for the possibilities of understanding and control. Habermas (Wanjcman, 2002: 349) added that a new modernist and technocratic ideology is the economic growth and social development which is constituted by scientific-technical progress. A new modernist and technocratic ideology took the place of the legitimating role of market liberalism.

After the Frankfurt School and Marxist Analysis have full-fledged examination of the dichotomy of neutrality and dependency, another point of view is the path-dependence theory that focuses on

how technology choices have created important paths for development. Dosi proponent of theory of technological paradigm, argues that technological developments assign the evolutionary path over which society must travel and this theory is technological deterministic and the enterprise organization takes part in a free market economy as the actor(Olsen and Engen, 2007: 461). According to this view, the existing technologies have been shaped by the market driven needs.

2.5 The Contemporary Approach to Technology

Social Construction of Technology is a newer approach that advocates the notion the construction of artifacts and technological practices are socially mediated and determined rather than natural world (Parayil, 2002: 51). Many of the new explorations of the social standpoint of technology were guided by the social construction of knowledge discussion in 1960's period. The mid-1980, Pinch and Bijker developed a social constructionist view of technology that the definition of technology has been explained in three layers. These are physical objects and artifacts, activities and processes, and a layer that refers to what people know as well as what they do. (Olsen and Engen, 2007: 458).

In SCOT, there is much opposition to the existing theoretical framework of technology. The simplistic generalization "science discovers and technology applies" has been rejected. But SCOT argues that the science and technology have become mutually determined. (Pinch&Bijker, 1984, p.403) The rejection of the simplistic generalization by SCOT has reminded us the challenging of the positivist understanding of the methodology in social science after the Thomas Kuhn's '*The Structure of Scientific Revolutions'* and his paradigm shift.

Bijker and Wiebe divide this approach into three components that are interpretive flexibility relevant social group, closure and stabilization, socio-cultural and political milieu. The interpretive flexibility brings up the empirical program of relativism in the social studies of science. Especially, technology is labeled as black box which becomes invisible. There are inputs and outputs in the black box that do not contain its own complexity. The more opaque and obscure the technology becomes, the higher possibility of success the technology can get (Latour, 2008.) He argues that it should not be a black box, rather it should be open. Layton (Pinch&Bijker, 1984: 404) added that a body of knowledge and a social system has been required to understand the technology from inside.

A component of the SCOT is the interpretative flexibility which has an attempt to explain the technology from inside. The interpretative flexibility is the transformation of the artifacts into the technological artifacts through the product of the inter-group negotiations. (Pinch &Bijker, 1987: 30) This group negotiation between the actors have crucial role in the technological development.

The distribution of interests, strategies, and knowledge of the negotiation process participating actors determine where the outcome of the innovation process (Olsen and Engen, 2007: 458).

The SCOT framework suggests open-ended innovation process and many different factors shapes the technology at the same time. For SCOT, the social interaction between relevant groups has resulted in technological development. The technological development does not have to be as a response to market demands, external shocks and technological opportunities. (Olsen and Engen, 2007: 457) The social interaction between relevant groups is a decisive actor to track the changes in technology and the social interaction has multiplied in accordance to technology and science. The multitude of social interaction expands and develops their existing culture and exploits some part of culture of the other. They are in a symbiotic relationship.

Science and technology are both socially constructed cultures and sustain cultural resources which are suitable for the purposes. (Bijker and Pinch, 1984: 404)

As mentioned above, the centrality of social interaction between relevant groups is so obvious that SCOT can perceive success or failure of a process or an artifact evaluated as a social achievement in terms of social factors. The social factors include the multitude social interaction between relevant groups that has shared the same set of meaning attached to specific artifact (Pinch and Bijker, 1987: 30). The artifact can represent the values, objectives of certain relevant social group which depends on heterogeneity in a development process.

The power relations in relevant social groups have complicated to forecast the consequences of interaction. Because there can be inter-group and intra-group conflict as consequences of interaction among the distinct social groups in the process of artifact development. The result of interaction among social groups can provide consensus and it is possible to lead to the critical thinking. Klein and Kleinman criticized that the SCOT ignores the systematic asymmetries of power and the unequal power relations in the structural features of social life (2002: 29).

Nevertheless a multi-group design process can experience controversies when different interpretations lead to conflicting images of an artifact. Design pursues until such conflicts are resolved and the artifact no longer have a problem to any relevant social group. The multi-group process achieves closure, no further design modifications occur and the artifact stabilizes in its final form (Klein and Kleinman, 2002: 30). The core point of the closure and stabilization is no longer change in artifact within the end of multi-group process. It is a continuous process of mutual shaping of technology and society. This process has been illustrated by Bijker in his studies explaining how SCOT can be constituted politically. In this case studies, he dealt with early development of bicycles, bakelite and fluorescent lighting in a broader sense. Bicycle takes part in

mechanical technology, bakelite chemical and the fluorescent lighting electrical. Especially the bicycle has debated from the user perspective (who rode the bicycle and how). The bicycle's development brings the relevant social group into open. For instance; tricycles were permitted machines for women, but women are potential bicyclists. For this reason the description of relevant social groups is elaborated in order to define the function of artefact with respect to each group. The problem of each group regarding to artefact and its solutions are identified and all kinds of conflicting technical requirement, moral conflicts are possible (such as women are wearing skirts or trousers in high- wheeler) (Pinch and Bijker, 1984: 415-416) Women can not ride the bicycle in high-wheeler because of the contradiction of technical requirement and moral values. The technological design restricted to women's riding of bicycle that came with shaping and reshaping of the technology because of moral conflicts and technical requirements. In other words, Bijker explores the technological change in bicycle as the role of changing gender relationships in shaping a technology.

The fourth part of SCOT framework is socio-cultural and political milieu in which the background of group interactions influence the meaning given to an artifact and artifact development takes place. The group interaction includes their relations to each other, the rules arranging their interactions and factors determining the power differentiation. (Klein and Kleinman, 2002: 30)

In sum, SCOT avoids the linear analysis of technological development and the important point is internal dynamics of technology. SCOT perceives the technological change as an entirely contingent and messy process in which technological outcome is influenced by heterogeneous factors. Technological change has constructed in multi-variant condition (Feenberg, 2003: 51)

On the other hand, SCOT is criticized by Actor-Network Theory (ANT) for focusing on social elements such as social groups and interpretation process instead of the natural and technical elements such as natural forces and technical devices. (Feenberg, 2003: 53) In other words; the reference point is the social factors, groups to explain the technological development in the place of natural and technical factors.

In contrast to SCOT, for ANT, technical devices and natural forces can be taken as actors in network to provide the stabilization of technical or scientific objects. The consequences of social factors are not adequate by themselves that's why the entities are not only socially constructed. (Feenberg, 2003: 53)

Therefore we can say that an actor-network perspective of technology in which society and technology are mutually determining can be considered as alternative theory to SCOT**.** The actor-network perspective attempts to explain social and technological evolution just only taking neither

technology determinism nor social constructionist into consideration. It combines that technology and society are in mutual determination. How it can be occurred that the actor-network theory is not reducible to an actor or network. Networks involve a series of heterogeneous elements that can be animate or inanimate. As a result, natural or social (non-human-human) could be defined within the mutual relations and bring new elements into the network. Latour, Callon and Law are the protagonist of this theory including not merely people, but objects and organizations in the network. That network consists of both social and technical parts or is playing in an association between human and non-human parts. Besides, the social and technical are inseparable parts of the ANT unlike SCOT's emphasis on just social factors. The contingency of networks are not determined, permanent or universal. They are rarely stable for long and continually bring in new elements and change the relations between actors. This condition can not render possible the system as closed. (Wanjman, 2002: 352) In other words, this network is accepted as an open system in which modern society has to be described as having a fibrous, threadlike, wiry, stringy, ropy, capillary character.

This capillary character has reminded us the Foucault's analysis of micro powers, capillary forms of power. The other characteristic of network is explained by Latour. The geographers define the space as proximity and distance in metrics and a scale without any connectibility. The network is liberated the definition of space from the tyranny of geographers. Thus the space is neither social nor real but it is associations. (Latour, 2008)

The other point to be emphasized is the context of network in which actors and actant are the players of ANT in the heterogeneous network. In general sense of Sociology, an actor is distinguished from the actants and actors in ANT that interpreted it as a semiotic approach. The semiotic actors are hybrids which shapes their own actor-worlds. The actor is not related with human intentional behavior as an entity but it is more abstract term that includes the human, non-human actors. (Fountain, 2008)

In ANT, the heterogeneity of entities and the association of human- non human actors imply the discussion of the position of the social in the sociology. Latour perceives the social as which is not at the centre of the sociology but rather it is the association. Latour has influenced by Tarde who defines social as special part of reality which is distinguished from biology, geology, economics, and etc, the social is the type of connections. By this way it can be conceded that the social has not a homogenized essence rather there is movement of connection between non-social elements.

Moreover, he introduces us the concepts of purification hybridization and the translation. The differentiation of purification and hybridization will be touched upon according to Haraway's debate on cyborgs in the later part. In addition to that translation is a process that is the reign of the

new objects. The new objects contain the creation of hybrid of nature and culture (Gane, 2004: 77, 82). This translation serves as which human and non-human acts, actions and agents are composed. Actors are inscribed to an interrelated set of entities successfully and the related group of entities is pertained to actor-world. The process of an actor is inscribed to other entities is called the process of translation (Fountain, 2008).

On the other hand, the actors are not passive and differing accordingly influence or resist the influence of other entities in a heterogeneous network of entities, in contrast to Marcuse's analysis on technology. The actors have maintained its status in the continual process of circulation and change in heterogeneous network. Latour has the desire to constitute the longer networks that are multiplying the hybrids, half object and half subjects. (Machines and Facts) Latour avoids the universality and absolute relativism as in SCOT (Wise, 1997: 37)

Actor-network relation is criticized for its distribution of agency. There are heroic scientists, engineers or of failed heroes constructed by Latour. This would seem no room at all for women who have a secondary position in scientific or technical work and may see the activities of science and technology quite differently. ANT enlivens the following of the heroes and would be heroes. (Feenberg, 2003:57) ANT gives a special emphasis on scientists and their laboratory and it leads to neglect the discussion of gender, class and other social inequality.

The more recent intellectual development represents the change in conceptualization of technology, including the perspective of the Social Constructionism and Actor-Network Theory and the critique on the techno-scientific community are referring to emergence of Postmodernist critique to Modernism since the mid-1980. Foucault describes the dilemma of modern condition as the Enlightenment which has a promise to achieve the freedom by means of exercising the reason, merely it has not been actualized completely in contrast to that the reason leads to a domination that seizes the place of freedom by force (Feenberg, 2003: 13).

Post-modern theoreticians criticize the modernist ones that technology is perceived as an external variable, universalistic force and has a homogenous structure instead of contingent, heterogeneous characteristics. In the post-modern condition, Borgman refused a universalistic method of truth or the set of technique to dominate and control nature, neo-positivistic concepts of science and hard science which ensure the truth and objectivity (Kellner, 2008). This objectivity preserved the dominant mindset in leading intellectual and academic circles. He suggests new mode of information- processing and new computer- new media technologies such as virtual reality, simulation and other exotic high tech instruments that leads to change in the economy, society, culture and everyday life. To overcome the technological determinism, the interpretation has been made through the global restructuring of capitalism and the new synthesis of capital and technology

that are the critical point of the social transformation. On the other hand, the use of new technologies addresses to the new hegemony what has been counted as the knowledge obtaining criterion of translatability and the primacy of human subjectivity superseded the machinic tendencies of modern technology (Edgar and Sedgwick, 2003: 406).

This subjectivity was accepted as the essence of the knowledge before coming into prominence of the machinic tendencies of modern technology. Recent analysis of the knowledge has been dictated by technology and knowledge is transformed through the technological process. According to Lyotard the miniaturization of computing technology and availability of high power machines decrease the domination of modernity that refers to the meta-narrative or grand narrative, the totalizing scientific discourse and individual some kind of truth and guarantee of the truth. The legitimatization crisis through knowledge is occurred by asking of these questions: who decides what knowledge is and who knows what needs to be decided. Modern knowledge is anticipated to construct the set of universal truths, on the contrary that postmodern knowledge rejects the meta-narrative and is comprised of the constant search for instabilities, heterogeneity, plurality, and the pragmatic construction at a local level and proposes micro rather than macro politics (Clarke, 2006: 116). The new forms of knowledge stiffened the thought of the difference and diversity to criticize the positivistic science and the rationality of social world. Nonetheless it implied an epistemological shift in modern to postmodern condition.

The other debate on the postmodernist and modernist view that the case of cyborg is a hybrid organism that is consists of human and machine part. The development in multi-media technologies, the dissemination of internet, the global flows of capital, deterritorialization, and flexible accumulation are signaling the cyberspace, a social setting and that has non-physical ground and subsumed the communication and computer technology within fluid and heterogeneous networks. Haraway describes the cyborg as a cybernetic organism, hybrid of machine and organism, a creature of social reality as well as a creature of science fiction. There is a complex and dualistic position of cyborg as a concept that belongs to modernism and postmodernism.

The cyborg represents the binary between the science as social reality in positivistic sense and the science fiction as virtual reality (1991: 149). In this sense the definition of cyborg is differentiated accordingly a modernist or post-modernist perspective. According to Adcock, the cyborg as a modernist construction represents a nihilism and also a radical freedom. Latour has added to this discussion that the cyborg is not related with just simulacra but has strong links to modern institutions, structures and drives .The cyborg entity is not a unified element of human and technology but it is just fragmented. The technical elements and human elements are in struggle and it is consists of the monstrous hybrid production. But it is still modern (Wise, 1997: 42). The existence of the concept ‘cyborg’ has been made the discussion of the separation of post-modern

and modern social relations meaningful. The in-between position of cyborg has continued envisioning the contemporary boundaries of technology. The differentiation of postmodern condition from the modern one is reflecting the cyborg's position.

In the postmodern condition, the problem is referring to heterogeneity, micro-politics, difference, and plurality. The micro-politics and the assertion of pluralism have altered the emphasis on ethnic groups, gender and class relations in the discussion of postmodernism. This alteration gives a new value to challenge the dominant ideologies around the gender relations. The fragmentation of grand narratives of patriarchal society has emerged with indeterminacy position of gender relations. The difference between man and woman is a problematic issue on the alternative conception of technology in the postmodern condition. According to Haraway, the cyborg can be considered as struggle of military origins and feminist marginal uses and positions and the cyborg is not new and unique. The identity problem with cyborg is not a cyborg, is a becoming and is the modern itself. The cyborg, as signifying an identity problem, is a radical figure to connect the purified categories. (Human-non-human and female and male) (Bell, Loader, Pleace, Schuler, 2004: 54)

Haraway constitutes her arguments on Latour's actor-network theory including the passive to active objects, scientific subject, animals, machines and women took their shapes in an unstable network of realized alliances between human and non-human actors. She gives an emphasis on cyberpunk politics that include the cybernetic ideal of biology and technology united under a single scientific paradigm. The social and natural phenomena are controlled by scientific mythology. This produces a hybrid; cybernetic mythology in which women and machines melt down feminizing the cybernetic ideal form within discourses of science themselves. The consequence of this condition is simultaneously to refuse the feminist critique of technology that reduces it to a male thing (Schneider, 2005: 67).

The common perception of technology is reckoned with man's control and the patriarchal relations. The technology dominated by man can be considered that normalizes the conditions of unequal positioning of women. The technology ensures mold not only class relations but also gender relations in which sustain the existing power relations in society. Haraway stated that before cybernetics, machines seemed clearly under man's control and machines applied the human directions or convey the human qualities by human. In contrast to that in the millennium age, machines make differentiated older ones that are between the natural and the artificial, mind and body, self-developing and externally designed.

The source of the authority has inclined to machine closer but it is not necessarily to technological determinism that the machines destroy humans but cyborgs unites machine to ascertain our survival because this fusion enhance, alter and adapt our bodies(Schneider, 2005: 65). In this way we can

say that the cyborg is a double-edged figure that have a tendency for feminist opposition and maintain the power of traditional techno-science and its social relations. To summarize the thought of Haraway that technology should not have been criticized sharply as rejecting it. As assumed by Haraway, the technology produces new meanings and new entities to affect the gender relations positively.

The changes in the self are constituted as decentred, multiple and fluid that reflects the post-modern condition. Technology offers cyberspace that create new communities and new tools for global information exchange and political organizing (Wajcman, 2002: 359). For instance the internet deterritoralizes the anti-globalization movement around the world, because this movement has gathered up people through different places without any spatial and time restriction. The political resistance to the existing system has a simple way without any face to face interaction by means of new media networks and communication technologies that manifest the possibility of liberated from the traditional relations. For instance the rapid coordination of global political campaigns against the Davos or a war in anywhere is possible with communication technologies in this digital era.

On the other hand, the free movement of technology and its indeterminacy characteristics bring to our minds the emergence of risks of technology. The uncontrolled technology can be associated with the indication of autonomous characteristics which can be firstly observed in technological liberation from the constraints of nature. The modern society is exposed to risks leading to the unintended consequences of technology as a result of the modernization process in which the discussion of the functionality of technology and the notions of anxiety and trust among society have been lightened up. According to Beck, the risks are manufactured by human beings and it affects the modernization process itself. The risks of the modern societies are differentiated from the pre-modern societies' conception of hazard-danger that is related with famines, disasters and natural phenomena. In the risk society, the safety of nuclear power, gene technologies the effect of radiation and chemical poisoning are emerged as model of risk. (Abbinnet, 2003: 160-161) Which factors determines privileging of the technological area is a vital question to predict the risky areas of technology.

Beck indicates that the outline of the technological development is bound to the standard of business efficiency and profitability criteria (1997: 118). The ideology of science and the method is not self reflexive because research practices are forced by the general dynamics of the economy. The technology can not take an action in cooperate with science by itself. In other words, Beck emphasizes the colonization of science by enterprises that control the generation and distribution of the capital (Abbinnet, 2003: 162). This condition leads to the blindness to the technological risks.

Even the technology policy maker, the state, has been influenced by the transnational actors within the globalization.

In contrary to industrial society, the risk society does not come out the inequalities of class and strata, the model of risk does not changed in accordance with class structure that lower classes and upper classes can be exposed to the same risks within the new technologies (Abbinnet, 1997: 163). Beck's analysis indicated the change of interpretation on concept 'class' that the social change can not be merely occurred with the class struggle like in Marxian sense. The recent perspective assumed that the capitalism has changed within technological development and it contributes to new economy that constructs new class position. New class position is called immaterial labor that is emerged by the restructuring of capitalism. The immaterial labor is related with intellectual on conceptualization of class in which labor produces an immaterial good that is a cultural product, a service, communication, knowledge (Hardt and Negri, 2001: 29).

In the post-modern sense, the newly defined immaterial labor is implied the weakness of class constructed by Marx. The postmodern critique promotes the consumption logic rather than production by means of the fragmentation of communication. But rather the analysis of class division has been interpreted differently with including the new conceptualization of technology. Marx just sees the impacts of technology on the economic activity, such as forces of production. Bourdeui organized his debate on technology is related with habits and practices and it sometimes crystallizing them and sometimes promoting them. The technology is not independent of social factors that contain technological production and consumption and technological practices are socially stratified (Sterne, 2003: 377).

The technology is usually perceived as the big-machines or complex entity whereas forks are assumed that is the part of technology and it brings up into mind class connotations too. In fact fork has not a special function but lifting the food instead of using hand. But not using fork is not a socially acceptable in polite society. The fork has arisen as a technological product that transforms the individual's disposition, reactions and habits. The condition of ability to use fork leads to shame and embracement- feeling. The social determination of these feelings is assigned to have higher or equal rank in the society (Sterne, 2003: 381). The example of fork as a technology figures out the relationship among the habits or practices of technology and the social relations. The habits and practices are interdependent to the technology that may contribute to shape the practice and habits. Technology is socially situated and involved in social struggle. Moreover, technology can not be studied without society.

According to Bourdeui technology do not just occupy a predetermined social purpose; technologies are socially shaped along with their meanings, functions, and domains and use. The makers and the

users of technology determine the role within collaboration. The consumers and producers interdependent with the technology and one can not be isolated from the other, so the transformation of one can change the other over time for different groups of people. Bourdeui introduces us the concept 'habitus' that intercedes between relatively structured social relations and relatively objectified forms of economic or social agency or interest and habitus is expressed in a way that person's walks, talks, types, plays a musical instrument drives , her aesthetic preferences , perceived health needs etc.

His emphasis on the social change and society does not refer the struggle between the ruling (bourgeoisie) and the ruled (working) classes to control technological and industrial power. Nonetheless society is fragmented between various specialist groups that keep the mutual relationship of exchange and subordination. A group logic dominates the society in which system is sustainable with the lower classes imitate the consumption and behavioral pattern of upper and elite classes (Sterne, 2003: 387). In other words the elite hold the power in determining the behavior and actions of lower classes. (Parayil, 2002: 58) In the postmodern time, the consumption is focused on rather than the production and the distinction between high and low culture as result of commoditification of culture has emerged radically. As Bourdeui mentioned that the high culture dominates lower cultures under its fragmentation of space and reality. Touraine explains the social change as a concept as grounded on class conflict, whose conceptualization is different from the Marxian one.

In the post-industrial society, class conflict has presented between the technocrats and their corporate sponsors on one side and the consumers on the other. The consumption has the major role to explore the status of technocrats and the liberal state and spreads out the antagonism. (Parayil, 2002: 57) how this antagonism is constituted and what is the resource of this antagonism? It is difficult to answer these questions that describe the existing condition.

On the other hand the post modernity cannot set apart from modernity that constitutes surveillance practices and surveillance technologies. The rationalization of the system is harsh to monitor the individual not only at work place but also during the process of production and consumption of that individual (Feenberg, 2003: 17). The forms of power has encircled the individual's life unconsciously that modern nation state has succeed the computerization of surveillance without any resistance mechanism. The technology can be considered as a way of domination and the sustainability of the system. Foucault draws the picture on technology of discipline, surveillance and punishment that the most important transformation is the scale and continuity of power and the purpose of the discipline coerces and generalizes docile body that is provided by rational, efficient technical society: an obedient, hardworking, conscience-ridden useful creature, flexible to all modern tactics of production and warfare (Clarke, 2006: 96). The docile body does not offer an

opportunity to resist the modern forms of power however power is plural, immanent, mobile, unstable and decentralized.

According to Foucault, hierarchical observation is main focal of surveillance which can be taken as the vital part of production and control. The Bentham's panoptican model is used by Foucault as model for a modern disciplinary society to observe and normalize; the Foucauldian model includes not only prison but also hospital and factory. Moreover the contemporary society is exposed to the world of electronic surveillance is described as super-panoptican that includes a virtual realm inspired from the Bentham's original prison plan. This virtual realm comes up with the restricted individuals into the circuits of their own panoptic control and the computer language constitutes the subjects rebutting the centered, rational autonomous subject of modernity (Brey, Feenberg, and Misa. 2003: 175).

The increasing communication facilities are assumed to provide the control of society and shape the language, practices in the digital era. The control on labor, visual culture added to language and practices produces the ideological apparatus on society in a decentralized hegemony. Feenberg emphasized the technical system accordance with the requirement of a system of domination and the social coding of technology as the technical code of capitalism (Wise, 1991: 74). This code is an effect of capitalist hegemony reproduced by the ideology of control that reconceptualize, reorganize and legitimate the system. The capitalist system has benefited from technology as a legitimating instrument in which argument technology is considered as dependent variable.

This chapter tried to overemphasize both modern and post-modern approaches to technology in the literature. This thesis develops a critique to modernity benefited from Frankfurt School and Foucault. The critique to modernity involves not only economic sphere but also cultural sphere in terms of Marxian analysis of technology and Frankfurt School analysis of culture industry. The post-modern approach is not delibarately emphasized in this study. Although this study has a critique to modernity, it takes the criticism of technology up by using analysis of modernity.

CHAPTER III

DEPENDENCY VERSUS AUTONOMY OF TECHNOLOGY

A critical discourse on the technology is evolving through the autonomous characteristics of technology after 1980's. The new approach on technology raises intriguing questions. In the last twenty years, the sociology of culture has begun to penetrate profoundly into the deterministic understanding of the technology. It was assumed that the technology creates one-sided effect on society and the one-sided effect can be positive or negative. This relation consists of top-down hierarchy construction shaped by technology itself. The crucial point on the debate of the autonomy of technology is the limits of the human intervention in the production, consumption and reproduction of the technology.

This study focuses on the autonomy or social determinism of technology and pose a critique to technology involving the analysis of capitalism. The cultural critics has been evaluated in the analysis of technology by using Frankfurt School. The Marxian analysis of technology and capitalism is taken into account in terms of criticism of modernity. The Foucauldian analysis of power has added to the analysis to criticize the modernity.

The contemporary theories have demolished the dichotomies of human and nature, nature and culture, rationality and irrationality, human and non-human, object and subject. The breaking old dichotomies represents newly emerged social relations. In this sense, the relations of human and nonhuman reshaped through the new conceptualization of technology. It can be assumed that the modern theories deal with the technology as an independent actor of social change. The technology is asserted to be a part of production sphere in the modern theories. The social organization of production is performed through the development of technology.

The Marxian analysis of technology is concentrated on the industrial production sphere rather than cultural sphere; life style and consumption. In this context, Fine and Saadfilho reject Marx's view evaluated as uni-linear development of technology that guides the historical change shaped by the development of production (2004: 8). Fine and Saadfilho interprets this way of evaluation on Marx, as invalid. The social organization influences the mutual determination of relationship between society, technology and history. In the capitalist system, the technological development is forced by the profit imperative across all commercial activity. For Marx, in the communist societies, the

technological development would functionalize to get rid of the repetitive, physically demanding, unsafe and unhealthy tasks, reduce total labor time, meet basic needs and develop human potential (2004: 8). The technology is regarded as machine in the theory of Marx who is trying to explain the relationship between the social organization of labor and machine. This relationship demonstrates that the machine is a competitor for workman, making the production more than it is demanded and the machine is a powerful instrument for repressing the strikes of working class (Wise, 1997:156).

The outstanding question of the theory is this: 'who controls the labor'. Braverman problematizes the question that the existence of machines is for serving benefits of humanity, but who controls the capital accumulation determined the ownership of the machine. The labor process has begun to be controlled by machine whose control is used by the management(Wise, 1997: 158). In other words, the technical possibilities are given to management responsibility and by this way the control of the labor is expected to increase the productivity of labor. The use of the automatic systems increases the surplus value. This condition involves the transformation of commodity into money. The penetration of machine use brings the capitalist to sell more and more products at lower and lower prices (Abbinett, 2006: 64). The crises of over-production accompanied with the unemployment and under-consumption that represents the dilemma of capitalism. Technological shaping of social relations is critical for the discussion above. The emphasis on the autonomy of technology is examined in detail in the passage above. One of the interviewees (en_3) merely evaluates the analysis on the production sphere that technology is a conflict area of labor and capital and where the technology is evolved either the side of labor or capital. In the conflict, the domination of labor will be apt to determine the direction of evolution of technology or vice versa. For this reason the dependency or independency of technology is problematic issue shaped by the arising of this question: 'who has power on control/ownership of technology. In this sense technology cannot be interpreted as autonomous per se. In other words, the technology has a determined position itself in the conflict of labor and capital.

Marcuse and Foucault share the skepticism in respect to human agency in deterministic terms. But they oppose to the neutrality thesis of technology that Marxism analyzes the technical to be neutral and fulfill the natural needs. The critical theory rejects the neutrality and the ultimate control has changed on the political domination of interest groups (Ritzer, 2005: 178)

On the other hand, one of the interviewee (s_2) argues that the position of technology can be taken as a determinant position. For instance the nuclear central puts on us a pressure that increases its invisible power. The other example is from the same interviewee that Windows 2007 has been installed on her / his computer instead of Windows 2004. In the earlier time of her / his use of computer, the computer exercises its power on him within material conditions at a given time period but six months later s/he learns how to use it in detailed way, s/he has power on this issue

again. The relative position of technology is associated with the practices of social domination. The level of knowledge elucidates the significant changes on relations of domination. These domination relations strive for exercising power or management. The interviewee drew a line under this issue that the technology is not an independent variable that is dwelt on the context of economy politics; capitalism. The domination relations are oriented to the needs of the capitalist system through which technical control is spreading.

The interviewee (s_2) also emphasized the dramatic changes in the genetic technology that require the realization of the new age of control process on our brain, body in the molecular level. Even human being is abstracted from the social within the determinism of genetics that gains its legitimacy through complex role of genes in frequently explaining the social sphere. The genetic revolution increase the understanding of biological reductionism that fosters the trivialization of the domination relations or taking the place more control in the molecular level.

Moreover, the genetically determinant of social sphere is exposed to market relations more. The decline in the distinction between natural sciences and the social science indicates the pattern or an instrument for control and domination. As mentioned before the tendency of social sciences has similarity to the natural sciences to expect the needs of the capitalist market. For Corrigan (2009: 344-345) genetic revolution is connected with the large financial investments since late 1980. It is assumed that the unexpected scientific activity in molecular biology and genetics is highly ideological and serves the interest of the capitalism or develop the control mechanism for reproduction of the system.

The control mechanism has been constituted different and the technological advancement reshape the process in the Foucault's historical thinking. Foucault defines power/knowledge as a web of social forces and tensions and everyone is captured as both subject and object in this web and tensions. This web is built upon techniques some of them materialized in machines, architecture, or other devices, others embodied in standardized forms of behavior that do not so much suppress and coerce the individuals as guide them toward more productive use of their bodies. (Gerrie 2003: 15)

The knowledge and power become very closely connected to each other and knowledge creates new areas to dominate or domesticate the others. The system of social control has pervaded through people to attack the ideal of the original subject. (Turner, 2009: 135) The skepticism on objectivity has raised in the social sciences that reflect the social control and domination. Technology can be examined in the field where it exists now and how the control mechanism has been established through the history. Foucault (Goldman, 1991: 31) describes the transition from sovereign power to bio-power centers on which the new political subject operates through the governance of variability of biological life and new political subject aimed at involving a regime of power.

Even the power is exercised over the earth and its products rather than human body. The domination relations alter its focal point of power manifested in the micro-level. Foucault (Gerrie, 2003: 16) clarified that the single powerful individual was enforced by the industrial era as representation of prudish bourgeois elite but it is rather not an entity, it develops numerous micro-mechanisms of power. The origin of oppression is no longer big individuals with authority but rather self imposed forms of structured activity. The resistance mechanism is fragmented and the resistance is hard to be in struggle against unknown centered authority. These struggles are not to attack an institution of power or group or elite or class rather a technique, a form of power. Foucault's analysis stressed the form of power rather the technology to describe his philosophical analysis. In the Foucauldian analysis, the changing power relations are distinct from the traditional Marxian analysis of domination that includes class owners who govern the others or simply top-down domination structure. Foucault avoids the relationship of ruler-ruled that leads to the reduction of complex power relations in the society.

An interviewee (c_2) takes our attention to the similar theoretical standpoint with Foucault that Harold Innis carried out his study on the communication technologies in order to explore the role of the media in shaping the culture and development of civilizations. He focused on the economy politics of fur trade in Canada and the communication imperialism that is tried to relate with the dissemination of the telegraph network, railway and rivers. Innis like Foucault examined how power system works in the new technical capitalism and the capillary forms of power has been exercised through the space and time. For Innis, there are two types of society; time-biased society such as Ancient Egypt and space-biased society such as Roman Empire. Time-binding media contain the spoken language, clay, parchment and stone because they are difficult to transport. For instance in Ancient Egypt, stone as the durable media provided the Pharaonic class for long-term dominance. Time-biased media raised hierarchy, decentralization, provinciality and tradition whereas space-biased media foster centralization, bureaucracy, secularism, imperialism and use of force. Space-biased media are paper, celluloid and electronic signals that are capable to be in wide-scale distribution (May, 2003: 91). The interviewee interprets the Innisian understanding that the communication medium is biased and technology has biased characteristics and we could not evaluate technology as neutral. Innis stressed the time and space biased of the technology rather class-biased.

The newly emerged technology creates its monopoly of knowledge and new monopoly of knowledge will collapse the older ones. These are vital areas of struggle for revolution movement. The telegraph network of internet connection demonstrates us the borders of the communication imperialism of the technology. The increase in the control mechanisms within the satellites reduces the possibility of revolution. Innis uses the similar interpretation that the communication medium

make its capacity easier to control space (or territory) and increasing control over time. The monopoly of power/knowledge has also extraordinary control on the entities (May, 2003: 93). According to interviewee(c_1), the power emerges from the new communication technology that creates new monopoly of knowledge and is in a cyclical relationship with more newly emerged technologies. The newly emerged technology makes some nodal points of networks important rather trivialize other nodal points of networks. This represents the domination relations through the technology. If It is returned to Foucauldian analysis of power, the expansive understanding of power is everywhere in the new forms of rationalized human behavior. McLuhan argues that power is produced through media transmitted in its endless cycle(Gerrie, 2003: 17).

In this sense, the great umbrella debate on the autonomy of the technology gets difficult to clarify from now on. Innisian approach seems to be technological determinism but there is a high emphasis on time and space biased of society and how the power is produced/ reproduced through the communication technologies is emphasized more. The interviewee (c_1) insists on the central difficulty of the statement 'technology determines the social sphere'. S/he illustrates the social position of technology that we meet some special terms when we are using a computer. The hand-shaking is one of the terms that serve as a process of negotiation for proceeding of normal information transfer between two computers. The hand-shaking is such a tradition when people meet; this tradition is transferred to the cyberspace by means of an automated process of negotiation. The technology is interpreted as social constructed along this example. But the interviewee remarked that technology can be take place in relationality of the network on which has a fluidity of capital, power, technology, people, goods and everything.

The all types of communication within the given codes of society are imitated during the design of the computer. In the design of technology, the relational sense of society has come out in the field of the technology. However the consequences of technology can be autonomous rather than the design of technology can be more social constructed. The relationality is a state of a flux in the society. The network society becomes a functional phenomenon to explain the contemporary fluidity of relations. The fluidity of relations is a wide-spread pattern of network society in which the people communicate each other through digital means within any space or time boundary. It does not have to face to face communication and share the same spaces. Despite they are the part of the same network. Network theory has rooted in the Marx, Durkheim and Simmel's thought. The networks are a way to describe the web of interaction. During periods of profound change in the social theories carry the some reflections of the network theory on the classical social theory. For Durkheim, the interdependence among the actors who was reason and results of the growth in the intensity of interaction could be found on the basis of social order in complex societies. According to Simmel the pattern of interaction among group changes in accordance with the number of actors in the group. The dyad is constituted within two person interaction and triad is a form of interaction

between three people. Simmel showed differences of the social interaction at the individual and small group level (Ritzer, 2005: 539). The new version of network theory is seen as actor-network theory emerged during 1980's on the subjects of science and technology.

Actor and Network Theory has an endeavor to understand action, not directly related the perspective of the actor but rather in terms of its location within a network and its relationship to non-human objects (Ritzer, 2005: 541). One of the interviewee emphasizes a point that the network theories touch upon the meaningless of space distinction and the importance of being in the same network. If you are not in the same network with your neighbor, it will not be a meaningful significance to share the same space. However, the articulating dialectical relations between the face to face relations and relations without any space sharing have emerged. The network is the channel to organize the social relations and the social relations through network has perceived as independent from other social reality. The analysis on network has criticized that the social relations has been interpreted to be easy generalizable.

The network theory is evaluated as Eurocentric by the interviewee because the face to face relations are also becoming widespread around the world in the large scale in dialectical relation with the network theory. The dissolution of citizenship and the dispersion of community relations are to exist in the recent times. The critique on the network theory of Castells by Miles that Castells neglected the issues on the observational complexity of networks. The nodal points of a network are predominantly come out of the observational complexity. The Castells' network concept is distinguished from Latour's actor-network theory that is based on the relational dimensionality of human and non-human actors and their differing possible epistemologies. On the contrary to that Castells demonstrates the positivist view of objects or actors as existing in themselves (Miles, 2009: 1). The emphasis of interviewee (l_2), on the autonomous characteristics of technology creates new determinism through simplicity of relations and overlooks the complexity of social relations at the same time. Castells has a tendency to generate the determinism of technology through network conceptualization. Other scholar Raymond Williams criticizes the technological determinism that the technology is seen to create the modern world, its emphasis on the autonomous process in which relations occurred in predictable way and relations via technology is inevitable to change the world when it is emerged (May, 2003: 175). For instance the telegraphy led to industrial revolution, the internet has led to information revolution; these statements are realized the simplicity and hegemonic power of propositions by Raymond Williams who insists on the development and use of technologies are determined by the social relations of the world. Moreover the priorities of most powerful groups will play the major role in shaping the capacities of particular innovations. The technology has undergone this kind of deterministic view in which technology have power to change the social sphere in an autonomous way. The evolutionary economics analysis of technology bears the nuve of the technological determinism where the

universal economic rationality supersedes the other interacting utilities of actors. The approach on the technological development in evolution theory of economics pertains to university that a center for knowledge production, public/private research institutions and firms that use and produce the knowledge.

The neoclassic approach explains the technological development and in this process; the firm is the only decision maker by itself. The determining influence of the technology is reduced to the firms and their desire for the profit maximization. The technology is an instrument to be easy decipherable and does not construct any resistance mechanism against the demands of the governors (Soyak, 2008: 12). The internal conflicts between human and machine are formed and embedded into firms. In the analysis of neoclassical economics it is assumed that the technological development traces the evolutionary path that society must travel. This path is naturally given and this path acts upon social development independently (Bimber, 1990: 340). The existing conflicts are concealed and sustained the unequal positions and the unforeseen relations of domination. The depiction of technology in the economy is interconnectedness with its autonomous position, the problematic issue is the hierarchical relationship between technology and human that represents the determinism in the analyses of technology. On the contrary the technological development is socially formed and this social shaping approach is a rejection of technological determinist standpoint in which a prime causal of social change is the technical change that are uncaused and not from any social influences (Woolgar and Grint, 1997: 114).

One of interviewees (l_1) argues that technology can be seen as independent from the social setting in the instant evaluation but in the longer period, the social relations shape the technology. It can be accepted that the dialectical relations and materialism are absolute and it is known that nothing is absolute on its own in the social sciences. In this sense technology is coexisted with dual nature that is both dependent and independent from social sphere. Other interviewee (e_1) share the same drawback that technology is evaluated as independent in general analysis, but the technology has a relational dimension in the all of variables except from its nature. In the level of a firm, it has no ability to influence the production of technology whereas the social development is connected with the technology as not an independent variable. On the other hand the needs of society require the direction of which technology will be developed. For instance the new methods for healing AIDS or liver transplantation have been developed in the light of the need of the society. For this reason technology is socially constructed from some exceptional cases. Interviewees are increasingly taking stance on the dual nature of technology. Most of the interviewees give special importance to the social shaping of technology approach and this question who has power and who benefits from it. Raymond Williams stresses the importance of the purpose and social intervention in the development of technologies. If the technologies are social relationships, not static or predictable processes, the social struggles shape these processes. The technology contains the social

complications (May, 2003 :181). In short Williams mentioned that the real determining factors are the distribution of power or of capital, physical inheritance, relations of scale and size between groups. Moreover, Marcuse agreed with Williams on the importance of ruling and political interest that the machine is not neutral; it is guided by ruling and political interests. The social ruling of a given society is the technical reason altered in its structure (Clarke, 2006: 23). If the technology is relatively isolated from the domination relations in large scale, the analysis on the dependency of technology is biased against contemporary phase of capitalism. For interviewee (c_4) the conditions for capitalism allow us to produce or consume the technology and the domination relations are woven throughout all our practices with the technology. The interviewee (en_4) considered that if you use the technology as a tool to make life much easier, you are guided by the technology, but if you make progress on the production of technology or making software, you will begin to determine the borders of the technology in your life. Unless you know how to produce/use the technology it will be just aimed at solving definite problems in your life. The technology is capable to control you and your life in the long run. You have ability to produce, reshape, renew, and follow the technology that is developed to enable you to exercise your power on. In Turkey, there are few people who deal with the research and development of technology in universities; the others who have no contribution to the development of technology have been controlled by the technological products, processes. Nalbantoglu notes that Turkey as a dependent and simple consumer country should overcome its position to be more participating in the production of scientific and technological thinking (2009: 177).

The domination of technology is becoming widespread by means of market actors and its instrumental rationality. The relationship between human and the technology is based on the forms of the control of technology and its economic rationality. The control of human by things would render possible by means of technical efficiency and the necessity within the latest advancement in technology. In addition, the instrumental rationality is the part of the scientific-technological revolution which is result of capitalism and an inherent drive for the instrumental rationality. The Horkheimer's critique of instrumental reason concentrated on that the logic of system governed by instrumental action changes the increasing areas of social life within capitalism (May and Powell, 1996: 160). The instrumental rationality is the form of domination and the processes of the capitalist accumulation are hinged upon the new mechanisms for control and the level of the efficiency. In Turkey, the articulation of the economic system to the global capitalism requires privilege for the economic rationality on the basis of market demands. Best illustrates again the market relations on the increasing advancement in the biotechnology. For Best in the new advancement of biotechnology, the life is redesigned in the petri dish and the genetic codes are written as quantitative context again. The concept 'nature and artificial' continues to blur the distinction of relationship (Avar, 2007: 175). This condition is defined as the part of instrumental rationality. The instrumental rationality and the existing forms of bio-power get into the life in the

molecular level. Avar evaluates the newly developments in the science and technology that the institutionalization of newly science and industry is addressed to the economic rationality associated with the profit. The living organism is patented and the nature is exposed to exploitation more, the genetically modified seeds and fattening animals influence the villains in the less developed countries negatively because of increasing dependency relations to high-industrialized countries(2007: 175). One of the interviewees (e_3) agrees with Avar and added that the generic technologies such as gene technologies, space and nanotechnologies are treated as manna from heaven. These fields are closed shooting arena for the multinational companies that monopolies all of the sectors. If you would like to posses these products as less developed country, you have to produce market oriented products or be subcontractor of the multinational company. In general, rationality and value free characteristics are attributed to the technology that is freed from the private property. That leads to a perception of technology in neutral way. In this sense the multiple layers of technology are reduced to the neutral understanding in which capitalism has fixed properties such as instrumental rationality, technical efficiency, individualism. The interviewee took South Korea as an example to explain the dependency relationship between the developed and less-developed country.

The vicious circle of less-developed countries' positions in the development of technology would break down and South Korea can be considered as an intriguing case. The interviewee (en_5) assessed the technological development in South Korea where applied the process of finding out the technological principles of a device, object or system through analysis of its structure, function and operation, called reverse engineering. But in recent economic crises whole companies has passed into multinational companies' hand in South Korea. The restructuring of the capitalist system has occurred through lion's share of the production in the third world and the new technological advancement that is reckoned to be a chance to achieve the position of technology in more autonomy in the third world. This condition has influenced other less-developed or developing countries.

A comparative view from Turkey is significantly meaningful to enable to break down the vicious circle. The decision making mechanism determines the direction of the technological development. In Turkey the state had a tendency to lean on the solution of market and bore its indeterminacy of political sphere for the map of science and technology. Oztas argues that after the Turkish Science Policy had published in 1983, the Science Policy of South Korea was reached and examined and it had great similarities with Turkish one. However, there was a crucial difference between two countries that South Korea applied the policy in consistency to adopt the science policies of Japan. Turkey did not apply these policies and waste it at least ten years (Goker, 2002: 5).

Gonel supported this idea that Turkey has altered the state of model driven development to regulative state model in which the plan for development was prepared ostensibly. In last twenty years, the regulative state model of Turkey manifested the unplanned system in the long term despite the coordination of the market and state is inextricably interwoven in the framework of planning in South Korea (2001: 1).

One of the interviewee (td) points out the new techniques and social relations in the construction of knowledge. In the recent evaluation of the knowledge, it becomes a commodity which is indissociable from the knower, producer of the knowledge. The indissociability of scientist and the researcher, labor and labor force and knowledge and the knower do not have ability to meet the needs of the capitalism. The knowledge requires the newly commodification for each day. For instance, the plastic bottle is consumed and can not be reproduced again, in contrast to that knowledge or labor can not be just interpreted in objectified base and they can reproduce themselves again and again.

At the subsistence level, the workers continue reproduce their labor power. In the capitalist system the knower, the producer of knowledge, can not access to the knowledge freely. The knower is abstracted from its knowledge, restricted by the commodity relations in the market and as result the access to knowledge is gaining the characteristics of the property form, can be met in the exchange in a marketplace.

Inam demonstrates that the close relationship between the knowledge, science, technology and the market economy has been ossified the framework for the meaning, this framework, in which people live, weakens the critical perspective and being autonomous and success of thinking on their own (Kiper, 2004: 20). In the capitalist system the knowledge, would be bought or sold, is becoming widespread commodity for each day. Social scientists discussed on the current positioning of knowledge and to extend that the emancipation of people from all forms of domination will be embodied. A critical construction of the knowledge has been expressed by Mannheim that the knowledge is engaged with the ideas of particular historical groups. The social group has the partial knowledge and informs their actions which lead to social change in the totality that determines their knowledge (Edwards, 2007: 17). It can be defined as new trend that the knowledge as labor has been becoming objective but this approach is inadequate to analyze the newly emerged commodification of knowledge. The knowledge is supposed to stand in the position of neutrality. Objectified knowledge is not taken as perspectival in character rather there is the plurality of knowledge in society that emphasizes the contradictory character of social reality itself (Turner, 2009: 297). The objectified knowledge gives us the clues on association of the absolute truth rejected by Mannheim. He refused the postulation of the absolute truth and any radical relativism but accepted all relative character of socially bound knowledge and this issue has embedded into

the sociology of knowledge (Turner, 2009: 298). The relationality of the knowledge continued the contradictory relations with the objectification of knowledge. Mannheim criticized the Marxist analysis of knowledge as having totality in itself. For Marx, all knowledge of social, historical world is built upon the standpoint of the particular class positions. Lukacs added that all consciousness and knowledge is socially located that the values are related back to their social origins (Edwards, 2007: 11).

The knowledge is transformed to the informational commodity that can be bought or sold on the international market within new commercial strategies. The new form of knowledge-commodity represents the decline of nation state or increasing control of the multinational corporations to provide the legitimating of the power on the concept of efficiency. The technology is seen as indispensable actor to constitute the knowledge and facilitate the influx of capital in an efficient way without the time and space boundaries. The political relations over technology embedded into the contradictions of capitalist system. The instrumental reason dominated the modern thought that focus on the positivistic understanding and the technical and instrumental rationality will come under some sort of the political control in capitalist system.

For Marcuse, the exercise of the political control contains the technological rationality. The Marxist analysis of late capitalism takes a position in which the essence of the individual (his/her work satisfaction and desire) is part of the new technology into its administered functionalized totality (Abbinett, 2006: 79). The assumption on the rational action of individual engaged with the technology that necessitates emancipation of human existence in theoretically in modern times. The purpose of the human emancipation enlivens the critique to the Enlightenment that reminds us the neutrality and universality of systems such as technology, bureaucracy and markets in a rational base. For an interviewee, technology is neutral in the essence and produces newly power relations not to be able to control the social relations in it. The interviewee(s_3) also thinks that the technology is a process not to lead an emancipation movement. This movement intends to emancipate the individual from the oppressive traditional social bonds and the individual has also put an end to all feudal relations within the growth of the propertyless. It was assumed that this condition brought more emancipation for subject. However the new network that cannot be control of us has constituted the social relations of individual within tenacious bond that has advanced at unbelievable speed in terms of the technology as an in emancipated process. In the first half of the 19^{th} century, description of subject has not had validity, this subjectivity has broken down and the group of the subjectivity has no longer remained. Although the figure of rational based human does not exist as in the Enlightenment Era, there are lots of processes that involve affecting relations one another, and these relations build upon ambiguous whole to be difficult to explain as a system or a foe. The Frankfurt School also points out the decline of the individual that is associated with the theories of monopoly capitalism, new industrial state, the role of technology and the cultural

industries(Nye, 2007: 537). In contrast to that the interviewee(s_3) implied that the decline of subjectivity is not related to a system or a foe. The Frankfurt School has focused on capitalist system that brought the western rationality served as instruments of domination. Nye agrees with Frankfurt School that the private sector or the market by itself decide the best uses of new machines and nobody deal with this question how the computers and the internet are utilized for reconstructing economic hierarchies and recapitulating the social sphere in the rule of laissez-faire process(2007: 597). Previously the technology was evaluated as an actor of economy rather than of culture. However the technology has been examined within the scope economy as a factor for economic growth, an input for the development etc. In recent analysis, technology is also seen as a part of cultural studies that is described under the concept of techno-culture.

The technology as a cultural item in modern capitalism is not supplied to meet the spontaneous wishes of the public but rather the supply to the market is produced by the culture industry. Frankfurt School mentioned that the change of the liberal capitalism to monopoly capitalism that produces the culture industry in which are cultural products as a commodity. The capitalist relations organize the consumption and leisure by means of culture industry (Scott, 2007: 22). The new advancement of technology has increased penetration of the cultural sphere into the market. One of the interviewees(e_4) utilizes an example of iPod, which mass does not need but mass increases the demand for. The passive masses cannot be the producers of technology but they consume it. IPod represents the status of higher class positions that hold the power in shaping the consumption behavior of lower classes. According to the interviewee, the main problem is how the demand is determined and the technology users should decide their needs of each phase of technological advancement, because in her/his opinion, the capitalist system can be explained as demand-constraint system in which the market is a generator of the supply on the technological product. The desire of autonomous subject is manipulated to false needs that provide sustainability of the capitalist system. The culture has become the reproduction of the system through promoting the consumption of commodities (Scott, 2007: 24).

The technology comes within the same orbit of the culture that is linked up the media technology related to the new advancement of information technologies. Adorno and Horkheimer argue that the advertisement of the culture industry is successful to drive the consumers to buy and use its products (Scott, 2007: 24). For the interviewee(en_2), the technology is shaped by the necessity of the society and the market-driven development of technology should lose its grounds in the social organization in the long run. The technology is designed, produced and consumed in the relations of capitalist system so the fuller penetration of capitalist relations of technology can be finally actualized. It can be considered that technology is not neutral and has its direction to the dependent of the capitalist relations.

In the similar vein, Marcuse argues that the capitalist economic relations and commodity production are orchestrated on a repressive basis. The individuals are not only loyal to a capitalist work ethic but also tied into commodity fetishism (How, 2003: 88). There are workaholic culture, greater consumption of commodities and the globalization of capitalism that constitute the contemporary pattern of society. One of the interviewees (s_2) opined on the workaholic culture and meeting the needs of individual rather the needs of system and illustrated his/her arguments on the change in the understanding of holiday and the new forms of work organization. S/he explained this change in the historical way. In the beginning of nineteenth century, holiday was conceptualized as calm, relaxed and out of related work for the bureaucrats in Moscow, in contrast to that in recent years it does not allow for holiday as in nineteenth century. During the holiday the worker might be disturbed by delivering a phone call related to business. The worker has been controlled by means of black berry, wireless handheld device that the worker has to use to controlling email instead of being in the workplace. The system privileges its needs rather than the needs of individual. When a woman takes part in labor force market, woman should not get pregnant during her work life. The pregnant worker is thrown out of the labor force market for the benefits of the system. The seeking for the surplus and maximization of profit is difficult to neglect the needs of the individual that can provide the human emancipation or freed from the traditional fetters of feudal bonds as the Enlightenment arrogated. The capitalism pledged the growth of the individualism. It is assumed that the 'free' individual has emerged within the free market that liberated people from the traditional bonds. The delusion of free individual can be ended and a wide range of surveillance technology is developed in order to sustain the system and generate the docile bodies.

One interviewee (td) remarked that the technology provides answers for the needs such as physical needs-pornography, sociological needs-research, economic needs-surplus. The technology has mutually dependent and independent variable that can change its position in accordance with the determination level. The dual characteristics of the technology is illustrated by the interview of his/her research conducted in Ankara in which women organized to be a tenderer for government contract to complete the cleaning via the internet. This attempt can be called as the advocate network that provides and serves the break down of the exploitation relations through the subcontractor. The solidarity network is organized over the internet on the basis of the individual. If the virtual organization over the internet is transformed into the bases rooted in the reality, the fragile structure of virtual organization will be altered to powerful organization in the real struggle or solidarity. In this example, the wind has been blown over the benefit of the worker in the technology use. However the internet caused to the social crises and legal struggle over free speech, privacy, pornography and e-commerce too (Nye, 2007: 597). Other interviewee(c_2) explains the characteristics of the internet that reflect the dual nature of both the arena for the freedom to resist the system and surveillance mechanism on human.

In conclusion the multiple layers of technology can be produced through the continual interaction between different levels of social production and reproduction. The nature of technology is defined as the ambivalent process that is developed through the social values and not only technical use as distinguished from the neutrality. The critical theory emphasizes that the technology is not a destiny but a scene of struggle. It is a social battlefield that goes on the political domination over the technology (Feenberg, 2009). The neutrality of technology is touched on the pure instrumentality, the universality of the truth, the rational character and is standing on the measurement for the effienciency. The discourse has been constituted through value-free of the technology. The approach can be build upon the interaction of technology and society. This study has a criticism to autonomy of technology and this part has argued that technology is socially determinant and the capitalist relations shape the boundary of technology.

3.1. Technology and Social Science

The focus on the appropriate method for examining the technology requires taking account it's interaction with the social sciences. Since 1970's the pendulum technology studies in social sciences has swung from emphasizing the position of technology as independent variable to emphasizing the social construction of technology as dependent variable in the social sciences. In the study of technology, the autonomous position of technology is an umbrella debate that includes the intervention of human, the interrelationship between agent and structure, non-human and human, nature and culture. This debate is stemmed from an empirical turn embedded in the social sciences after the Kuhn's *The Structure of Scientific Revolution* in which scientific revolutions alter what scientists see. In other words, the observation in scientific endeavor is shaped by what people believe (Sismondo, 2004: 16).

In the Enlightenment tradition of thought, the science can be accepted as identifying the process of rationalization which moves the social and economic sphere towards the development where natural sciences has been stressed its most important position. The social sciences are conceived as technically exploitable in the development of technology (Hearn and Heiskanen, 2004: 16). The interviewee(e_4) agrees with this view that the technology is perceived as inevitable tool to combine the social science to the natural sciences and this condition urges to weaken the content of the social sciences. No longer, the studies of socio-metry that is a quantitative method for measuring social relationships, has not validity for evaluating the social relationship among the society. In recent years, a very high-emphasis on the statement 'the project' shows that the universities take part in the market economy. The plentifulness of 'projects' has developed through not only social science but also natural sciences in the same path. The scientific research in both social and natural sciences cannot be separated from the demands of the market.

Horkheimer makes this issue clear with a critique on the traditional theory. The traditional theory is ideologically constituted by socio-economic forces in the social sciences. The traditional theory is restricted by empirical evidence and destroys the social totality because of the expanding technology(Dahms, 2008:.22). The technology hides the linkages between the economic exploitation and bourgeois democracy in the capitalist system. The accumulation of scientific knowledge is formed as to its relationship to the market. In Turkey, the university was a vital medium of the academic missions for education and research. The mission of universities has changed after 1980's when the reproduction of the knowledge base was reshaped in accordance with market relations. The conceptualization of the 'Entrepreneurial University' has settled down and the success of the university became dependent to the level of cooperation with industry, it's

capability of inventing commercial products and the number of the published article in the international journals.

According to Ozugurlu, since 1980's university as a part of the innovation system has modified its structure for bringing up the human capital that penetrates into the research and development activities for competing with global market. No longer university is an incubator machine of new industries in the technologically determined economy, for this reason the cooperation of university and industry is an expected result of this program. In addition to that, the shrinking role of the state within new neo-liberal politics has a great impact on reducing the arena for the politics of university. During this period the politics of economics has been left to 'Princes' and the politics of technology and society are again left to 'the influence of the Market'. (Ozugurlu, 1998: 51, 55) The autonomous characteristic of the university has a conflict with the relations of market mechanisms and technology.

The other similar critics on the relationship between social science and technology by the other interviewee(en4) argue that technology is changing through the motive of the self-interest of dominant class. Moreover technology is not a completely positive or negative entity as to whom it gives benefits. The commercial interest groups and multinational companies determine the technological products and who is able to use these products. The departments of sociology and economics as social sciences should deal with the issue of the dominant class relations and relations of production in terms of the technological advancement. If a technological product is commercialized, it will come up to a creation of new market and new social relations. The ideology of dominant class has gone hand in hand the commercialization process of the technology. One of the interviewees argues that the multinational companies give direction to the innovation movement. The departments of the research and development in the university are funded by multinational companies that control the process of the funded research and take the property right of the commercialized technological product in the market. The market relations and technology creates a new ideological arena for university as an institution of science. Habermas emphasizes the ideological tendencies of technology and natural sciences and the erosion of the public sphere(Dahms, 2008: 22). Ideological tendencies of natural sciences are often related to technology that was utilized by natural sciences and was derived from the natural sciences. The natural sciences and the technology imply the rise of the positivist sciences on man and society. In recent years the strong in recent years positivist approaches got importance in the social sciences in which the quantitative method is used wide-spread to understand the social relations in the society.

According to Harskamp, social scientists are inspired with the ways of scientific standards from the methods of natural scientist (1996: 18). One of the interviewee(en4) agrees with this view that social scientists benefits from technology to prove their scientific analysis as similar to the natural scientists. The more quantized of the social sciences has increased the prestige of social sciences

which can be more acceptable and purified from metaphysics and philosophy by means of the technology. The production of knowledge in the social sciences is no longer ideological but it is more neutral to use the technological instrumental of the research technique.

Other interviewee (e_3) stresses the specified characteristics of the departments of economics within technological methods in the research which requires the usage of data and the analysis of the data, the planning for the input and output relations and developing for new prediction methods. The departments of the economics have an increasing tendency of using mathematical methods. Another interviewee (en_3) takes attention to the importance of interdisciplinary studies related to engineers and social scientists. Even an engineer is curious about the social impact of its products. If an engineer wants to explore the social risk of technological product, s/he will necessitate the quantitative data from the social scientists to calculate the social risks in scientific way. On the contrary, it can be assumed that the social sciences are more complicated than the natural sciences and the socio-cultural reality is comprehensible through various kinds of research methods including quantitative and qualitative. The homogenization of the research through numerical analysis can be fallacious for understanding the complex set of social relations in this field. Because the aim of social science is to not only investigate but also interpret the complex set of social relations. If the relations have been read inversely within the contemporary technological advancement of research technique, the quantized social sciences can be interpreted as ideological to conceal the contradictions of the capitalist relations and legitimate the position of the dominant class.

For Marcuse, the modern capitalism implied the rationalization of socioeconomic relations; the production of exchange value, the fetishism of commodities and the intensification of labor power requires the description of science and technology regarded as the reproduction of the political domination (Abbinett, 2006: 79).

After the debate on the quantized social sciences, there is a new trend to compel the social science in rigorously interdisciplinary perspective. The evidence would suggest that the extreme specialization in the field of the science confronts us with too much fragmentation so it becomes complicated to comprehend the social reality. One of the interviewees(l_2) agrees with that this fragmentation is dangerous to interpret the holistic picture of the social relations. The disciplinary division in which technology can be explained as a self-generating logics and its deterministic position become problematic. The political economy approach should be embraced to evaluate the social relations and the deterministic position of the technology. The political economy approach can be reckoned to be interdisciplinary perspective different than contemporary interdisciplinary approach by the interviewee. For Nalbantoğlu, the contemporary concept of interdisciplinary is the mechanic meeting of the existing sciences. This interdisciplinary approach intended to save the day or it can be easily marketable in the academic and interior/exterior market. (Nalbantoglu, 2009:

409) Thus, the market driven standardization of the social sciences leads to face us the number of such problems. The social science related to technology areas shaped easily by market actors strengthens new dependency relations in the world of science.

The other interviewee's critique on the social sciences is dependency of western theory in Turkey. In other words, there is no peculiar knowledge accumulation in the social science in Turkey. Not only the theoretical structure but also the methodology of the social science in Turkey is adopted from western theories. In Turkey it is hard to make prediction on mutual interdependent relationship between the technology and social science, because the existing process cannot provide adequate information to explain itself. Nevertheless, the reflection of western theory is significant in the evaluation of social reality in Turkey. The social structures and practices of other countries are evaluated by the perspective of western ideology that is seen as superior. (Dahms, 2008: 8) While the debates on the relationship between technology and social sciences are examined, the conflict areas are immanent into the social theory.

CHAPTER IV

THE CHALLENGES OF GLOBALIZATION TO TECHNOLOGY

4.1. Unforeseenability, Uncertainy and Risk

The future society addresses to different ambivalent framework of technology that turns towards new control mechanism and the danger inherently in itself. The technological solution to human related problems is realized by the positive and negative expectation in the long run. Every new technology imparts its deterministic position to the social relations. However it is hard to analyze technology without the contradictory relations in the core of technology. The contradictory relations can be accepted as a solution for the crises of capitalist system. The contradiction of technology is inherently embedded into the crises tendencies of late capitalism. The technology is often interpreted in the efficiency of its application and a vehicle for culture of domination. The technology is comprised of two contradictions that the technology provide the increase in control via the usage of multiple senses and sources of data that is not to allow for leaving any ambiguous gap for the modern society. In the contrary to that the uncertain or unforeseen characteristics pose a threat against the society. Considering the Chernobyl Nuclear Disaster and the development of the atom bomb are frequently used to explain the uncertainty of technology or misconducting the technology for the society. Some theoreticians stated that the risks and crises, ecological problems are the consequences of disorganized capitalism in which pass over the new legitimation crises. (Edwards, 2007: 153)

One of the interviewees(en5) legitimation crises of capitalism has similar points and set forth the contradictions of technology that the technology is used for the production sphere in which the human labor is foreseenable, knowable, and controllable. The surveillance technology has been growing in the cities to invade our privacy that is no longer confidential or unknown. In the long run, the uncontrollability has come up in the light of technology-use that is unbound with the control on the technology. Having power to exercise over the technology comply with the risk which is embedded into the market relations. For instance; the nuclear disaster is presumptive consequences of the technology in regard to capitalist system. In USA, one of the universities declared that the global warming has not phenomenological ground and this research is funded by the plastic or petrol-oil companies. Moreover, the drug sector is determined by the multinational companies that privilege which drug will be on the market first in accordance with the

maximization of their profits. The stock of drugs shapes the market instead of the needs of the patients to gain more profit. The unforseenable or uncontrollability characteristics are not immanent to the technology but the international organization of the property regime on the technology is related to them. The main reason of the perception of risk does not link with the production and consumption of technology rather the basic motive is profitability and competitive drive. The interviewee interprets the unforeseen characteristics or risk factors of the technology as the consequences of capitalism.

The risk factor is assigned to predict or foresee the whole of picture as a part of the surveillance society, information society. The capitalist relation conceals the new hierarchical structure that has arisen out of the biased technological progress. The discipline and maintenance of the order depend on new technological methods to observe and record the bodies and guarantee the internalization of the disciplinary power within the bodies. The technological culture shapes the risks and contains contingencies of the social and symbolic organization which is part of the destabilization (Loon, 2002: 45). The interviewee(c_3) explains the uncertainty and the contingency of technology in the light of example of computer. The computer is evaluated the system within which contains rational and autonomous agents. When the computer breaks down, the engineer solves the problem not to utilize the rational resolution in the computer such as turn on or turn off the computer program. It can become more sophisticated in solving the problem but the real complex systems and its automatic management can be explained in inadequacy of the rational consideration. The contingency and uncertainty of technology produces and reproduces the new spaces for thought of risk.

The risk is comprised of dialectical relationships in which the acceleration in bizarre system of control and the conflicting reduction of uncertainty and contingency are implanted. It is assumed that the enlightenment project requires the scientific rationality, the positivism and technology dominated the idea of modernity. The controlling things, mastering nature the desire to control the outside hold the insanity in the scientific rationality which postulates the idea of the emancipated and fulfilling of the human existence (Clarke, 2006: 60). In the analysis of risk conceptualization, the rationality is open to question and rather the construction of reality has an important authority on the social, political and economic forces.

One interviewee(e_3) emphasizes that the emergence of technology may include the unforeseen and unknown positions in itself. If you do the scientific research without any of the ideological standpoint, you can easily realize that the technology is self-governing and is autonomous. There is close relationship among the modernity, individualization process, the new conceptualization of reflexive modernity and the idea of risk society. The nature of individualization reflects the idea of risk society in the same way.

Beck refers to the individualization is not the increase in the isolation and alienation from society but the human-being from his-her socio-cultural milieu is not disembedded (such as detraditionalization) and then the reembedded into a world ordered and revealed by technology. The world of know-how is technological result and is part of exclusive property of expert systems mediated by technology. The individualization is a form of societalization (Loon, 2002: 26). The technology is bound to the modernity, rationalization process of society which are generating and legitimizing the risks. The interviewee(s_3) noted the self-governing of technology and risks concerned with the individualization or a form of also a form of societalization by Beck who affirms the social production of wealth increase in the social production of risk. The risk is characterized as a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself (Clarke, 2006: 167). The conceptualization of risk is used under the circumstances where the new forms of society has multiplied such as post-modern, information society, network society etc. The fragmented picture on the new forms of society can lead to neglect the unequal positions embedded into the society. It is considered that the high science and technology drives the development without any questioning.

The technology is considered as unforeseen or unintended consequences of the other risks that are related to the capitalist relations of domination. Despite of the fact that Beck does not emphasize that class relations are inherent part of capitalist mode of production; the classes are based on a differential ability to satisfy needs (Loon, 2002: 20).

The class antagonism is not obviously propounded by the conceptualization of risk society. The high-technology with emergence of the risk society alters in work, employment and occupational structures that are seen as an indicator of the systemic change. The information society or network society or knowledge society shapes the substantial changes in work and labor organization which transforms the classification of class. Lash argues that a new set of structural conditions of reflexivity consists of the web of global and local networks of information and communication structures. Life changes and class inequality no longer rely on a person relationship to the mode of production but the person's place in accordance with mode of information (Clarke, 2006: 173).

The problem is no longer accessing the productive capital or production, but accessing to places in the new information and communication structures. In this sense, Lash implied the third class that is excluded from the information and communication structures. It is called as reflexive loser. This terminology is adopted from the conceptualization of reflexive modernity, radicalization of modernity that is characteristics of risk society and the reorganization and reform (Clarke, 2006: 189).

The uncertainty and the unintended consequences of technology pertains to the change in the understanding of modernity that is focused on the positivism and has linearity. If the one interviewee(s_3) remarked that the technology is perceived as linear and predictable but posses the unknown positions that could not be consist of not only human but also non-human as Latourian terms. This non-human creates the problems of unpredictable, for example; Chernobyl Nuclear Disaster can be exploded because of non-human such as bedbugs or broken glass. It can be reminded us the Latourian terms of the translation is the mechanism that the social and natural worlds take from and whose result is a situation in which certain entities control others.

Power in this model has performed through translation. (Abramson, 1998: 5) In this sense, the interviewee (s_3) specifies that technology is contingent because of unknown. We do not know how to be done, what will be going on. This unknown position can not defined easily that it stands here independently, it produces itself and it has life in itself. For this reason we can not exercise power on the technology as indefinite. The more we obtain the knowledge the more power exercise. There is a circular relationship between the knowledge and power. The power is based on knowledge; reproduces knowledge recreates the knowledge to determine the way of exercise.

The hysteria of control, the decrease in contingency of technology has emerged. Whereas we have never known the whole thing related to the uncertainty of technology. This represents the will to circulate and articulate through all capillary forms of power. In other words, it would be exaggerated that the new forms of power become spread in the molecular level to control our brain, body. The uncertainty of technology brings the hysteria of control that is main characteristic of modernity. Moreover, Horkheimer and Adorno insist on the instrumental rationality that leads to make society more rational, control nature and predict the future and incalculable hazards become calculable risks. The modern life is consists of both rational control system and the risks (Clarke, 2006: 169). The capitalism requires the high technology that enables the calculability of risk or leads to high-tech risks.

According to an interviewee(e_2) risk is required to be regulated by the state. The process of technological development should be controlled to reduce the risks. For instance the establishment of hospital can carry higher risks for public and the precautions should be taken against any risks. The technological applications and opportunities on biotechnology contain the genetically modified food that carries high risks and are expected to be commercialized. The state should regulate the new high-tech risks in the networks of global distribution. The nation-state is not only actor to organize the technological instititutional capacity of the economy. The nation state has transformed and the neoliberal policies have embedded into the system.

According to Castells, the consequences of global networks of economy; communication and knowledge and information is the death of the sovereign nation-state. However nation-state will not be lost in institutional existence but the power apparatus of nation state has transformed. The negotiation process of decision making of nation state has been altered by means of bypassing and rearranging the apparatus in the networks of shared sovereignty formed (Castells, 2000: 694). The interviewee defines the role of nation state within neoliberal perspective on the conceptualization of the 'risk'. This perspective manifests us that state organizes legal system for the protection of private property rights such as; the intellectual property right and the liberalization and the internationalization of the market has emerged with the new legal regulations.

The emergence of finance capital and the monopolies of finance capital are growing up within the understanding of neoliberal state. The foreign capital is supported by the nation state that has to take attention to the risk on behalf of the capital or multinational companies. Avar illustrates that the transgenic seeds and these applications on animals have some problems and the risks of the condition has not been announced to public. In addition the research on stem cell, the cord blood banks are created as the commercial sector means to the hopes and fears are reduced to be commoditified (2007: 157). The state can not be overall responsible for the each of these policies on risks or newly emerged problems of technology.

The capitalization in science and scientific thought brings to our minds the instrumental rationalities of the state and the market. Feenberg added to that technology, production technologies; possess technical code in the service of capitalist goals of power and profit. The technical code is constituted by cultural sphere in the society and the capitalist relations embodied the hegemonic value of power that demands for the economic efficiency(2003: 186). The perception of risk takes shape around the instrumental rationality and the capitalist relations. This perception is socially constructed and produces new determinism of technology around capitalist relations. The mere reflection of capitalist relations in the world system has changed the perception of risk in the developed countries and less developed countries. The great risks of production become widespread in the Third World because the First World Countries consume what the Third World produce. In this sense the ecological degradation pertains to the production sphere in the Third World more.

The rationality, contingency, unforeseen characteristics of technology is refering to social change and social transformation. The dynamic characteristics of technology is linked with the expansion of capitalist relations. Although the contradictory nature of technology is related to its contingency, its risks, and it indicates a critique to modernity, it is rather associated with the disorganised capitalism and its contradictions.

4.2. Exchange of Time and Space:

The control of time and space became a central component of the debate on the modernity and technology. The first part of this study includes the time and space distanciation of modern episteme in which time is seen as superior than space. The organized capitalism embedded into the change of the flow of time and space in its global stage. This part involves a critique to

The informational capitalism rearranges the time and space that is constituted in the new hierarchy transformed the mode of interaction in the network. The limitation of modern is considered as the social space, the movement, influence of actors. Latour tries to overcome this limitation that the divisions between the human and technology has been going out of circulation and both human and non-human can have in interaction with each other. Moreover time is not prioritized over space and Latour argues that time is the consequences of interactions of social actors (Wise, 1997: 30). The networks attempt to replace the hierarchies that are organized around the distanctiation of time and space or human and technology.

Time is often discussed on the modern and post-modern terms in which time is divided into parts and organized to the hegemonic transition rearranged through the technology. In this sense the hegemony is carried through technological systems to restrain the organization of time. For the interviewee, there is a distinction that is between people who use their time freely or their time used by others and it is critical to understand the technology on the time and capitalist relations. It should pay more attention to the fact that surplus time has been produced by means of technological devices as Marxian analysis of surplus value.

The surplus time is used and controlled by others. The technological system provides the surplus time that is open to exploitation of others. The technology can not be evaluated as negative existence per se but the power relations are embedded into technology and the reflection on the technology can be read negatively. Lefebvre asserted that the daily life is colonized by the commodity, a modern postwar capitalism had pursued to exploit ad alienate at the workplace and now had started to take the control and enter in the life composed of non-working, reproduction, leisure, free time and vacation time that nurture the consumerism by means of new media. The analysis of Lefebvre demonstrates the examination of non-working sphere of life that is shaped by technology in recent times (Merrifield, 2006: 9). The leisure time is reinvested by the technology through less working time, the less reproduction time etc.

The main issue is how the everyday life is colonized by and who is benefited from it. One of the interviewees (c_1) asks the same question on the flow of space and timeless time; who benefits from it. S/he exemplifies that there is an increase in the flow of financial capital but layperson is not

directly influenced by it and this condition is not major obstacle to alter the waking hours of layperson. It leads to the change in the perception of time that we have to be more impatient such as just comparing the expectation of response for an email in a very short time rather than a letter. For instance the internet in Turkey was brought in 1996-1997, if the internet was closed for three days in these years, any reaction would be given by the public, and this situation was not so important but one hour is vital today because all systems will be collapsed such as insurance system, the quantitative security. The centre for disaster recovery is established to prevent the risks of the system. Turkey has similar structure with the other countries to take precautions against these risks.

On the other hand, the social groups acted on the basis of their interest constituted in accordance with the flow of space and shrinking of time. The decline of the natural barriers of time and space has transformed the international financial capital which has been growing decisive role in the global economy.

The explanation of the timeless time and the space of flow has been done by Castells that introduced the culture of real virtuality composed of timeless time and placeless space. Timeless time is the characteristics of given context that is the informational paradigm and network society, influence the systemic unregulation in the sequential order of phenomena performed in that context. The space of flows can be described that anything can happen at any time, it can happen very rapidly, and its sequence is independent from what goes on in the places where the effects are felt (Stalder, 1998: 304). The flows of space and timeless time are coincided within the process of financial transactions that is provided through the electronic networks on the global market.

4.3. Global Dependency

After the exchange of time and space has been emphasized, this part concentrates on the technology and the social relation in terms of global capitalism. According to Castells the new society is built upon the networks that are flexible and adaptable for managing the tasks and the internet is the major actor of the network society in which the electronic communication system has capacity to decentralize and adapt the execution of tasks. There can be the flexibility of tasks in the organization that eliminate the hierarchical forms. (Castells, 2000: 695) The interviewee(e_1) agreed with the Castell's ideas that people enable to work independently from the space. This is interpreted as both positive and negative. The restrictions of time and space to work has been liberated in terms of employees and this condition influences the shared of leisure time. At a time an employee may be sit and watch television, s/he can go to the beginning for the job on the

computer because the job can be done from home. Similarly the employee may not work well at a time, but s/he is surfing on the internet irrelevant to the job.

The capitalist system facilitates the flexible specialization and the new technologies alter the job description in terms of time and space. This conceptualization of timeless time and the flow of space refer to the technological arrangements through which labor works has changed and the information technologies freed the labor rather the industrial technologies. Nye argues that industrial technologies were homogenizing people, products and places (2006: 597). As the assembly line produced identical goods, it seemed to erase difference. Workers became interchangeable. The emergence of information technology requires the worker equipped with know-how and it leads to temporary unemployment in other sectors. The technological systems are getting more complex and interlinked and human beings became dependent upon the machine and had to adjust to its demands.

The flexible production, the organization of labor and the labor intensity of worker is combined with the global capital system. Castells argues that the electronically managed global capital markets manipulate the time and the work time is build upon the flexi-time to maximize its most effective use. The new types of work have unregulated characteristics freed from the time and space boundaries that bring the lack of continuity, permanent existence and generation of new hierarchies (Webster, 2004 :108).

According to Harvey flexible accumulation is based on the flexibility in regards to labor processes, labor markets, products and the pattern of consumption. It is characterized by the emergence of entirely new sectors of production, new ways of providing financial services new markets and greatly intensified rates of commercial, technological and organizational innovation (Edwards, 2007: 196). The Castell's network categories pertain to the all advanced industrial societies that hold social complex of organization. According to interviewee (en_5), production scale is getting smaller and the number of worker decreases instead machines replaces the workers. The free-lance working or tele-working models are settled down in the labor market. The risk factors of job are taken directly by worker when they are working as free lancer.

The globalization separated trait in consumption and production that belongs to Third World Countries and the mass consumption is emphasized in First World countries. In other words, there is a shift in manufacturing sector to service sector to match the development pace of the First World countries. The industrial manufacture production does not participate in the First World countries because the production is carried out in the Third World countries.

The conceptualization of consumption, the culture of risk society, virtuality has the fragmented role to depict the holistic picture of the newly emerged-society. The analysis of network society is a

reflection of late-capitalist society and it can be inadequate to grasp the social change in Turkey and similar countries.

The network analysis re-evaluates the existing condition in the society to examine the technology standing as neutral per-se. The innovation economy make an assumption that technology is a result of linear development and it is freed from the power relations and the network theory fends the technology off the hierarchical evaluation. Moreover, Aygül argues that the networks are presented to the problem for management as a democratic solution(2006: 153).

It is assumed that the network is the type of ascendant coordination to provide consensus and mutual trust rather the hierarchical relations. But it can not be proved that the networks are independent from the market and hierarchical relations. For instance in the European Union the main tendency is not getting the smaller scale of the economy, instead is growing within the merges and allocations. In the process of Turkey's integration to the EU, the networks in Turkey is seen more obvious and can reflect the hierarchical relations or unequal relations that is continued to perpetuate through the network analysis of the society. The technology does not just come into the world as a servant of humanity rather the instrument to whom the capital accumulation is provided in the ownership of the technology that remaps the domination relations in the society.

The interviewee (l_1), defines the utilization of concept 'globalization' to get out of the crises of capitalism that reveals the tools that is to be local, redeem the labor-capital conflict. The technology is defined as the part of the globalization and an instrument to overcome the crises. Ansal implies that during the crises period the authorities emphasize the importance role of technological advancement that can provide the most rational and efficient way of production to be represented the solution for the crises(1986:157). The notion of globalization and the technological advancement has been presented to be thoughtfully implanted in the solution for the capitalism crises. In the similar vein, Taymaz argues that the general view on the flexible technologies based on micro-electronics and post-fordist production will be playing crucial role to overcome the crises(1993: 6). The ways that the crises is getting out of, has been interpreted by the Neo-Smithian (flexible specialization) and the Regulation School. Jessop the interpretation of contemporary economy, society and culture can be examined in which the major goal of the technology is not production rather profitability and competitiveness that are fulfilled by the technological innovation and productivity growth(2004: 44). The post-fordist methods which are applied to maximize the profitability, can be defined the emergence of flexible specialization, the increase in part-time, temporary, self-employed and tele-workers such as home workers and the growth of the application of subcontracting, marketing. In addition to that the class-based discussion has been transformed because of new organization of labor and the class categories are newly redefined and the new conceptualization is open to discussion.

The fragmentation and pluralism related to the change in the origin of social movements that was relied on mass crowded in special groups rather now it is reduced the local dissemination and multiplied to gender, ethnic movements etc. The changes can be evaluated as the consequences of the post-fordism related to new forms of capitalism or the globalization as imperial power to colonize the life.

Castells indicates the global labor force and the increasing interdependence between local and localized labor forces s consequences of global employment in multi-national corporations and their cross-border networks, the impact of the international trade on employment in North and South, the local effects of global competition and flexible management(Webster, 2004 :365). When he depicts the informational capitalism within the global labor force, his conceptualization of new order does not allow for giving the opportunity for worker's emancipation. One of the interviewee (c_3) points out that people begin to share the profit not be able to rebel or resist as result of the increase in technological efficiency. Moreover people do not have to risk their life on the arena as a part of the social movement. S/he evaluated this condition that there is no longer conflict over the contradictions of class. To observe the class struggle, historical subject does not existed as subject. The interviewee illustrated this position that when the worker is thrown out of the employment, s/he does not need to go on strike. Because the factory is closed down on the ground that the economic crises has gone out and the worker just condemned the others who go on the strike.

The problem, it seems is not labor as a base of struggle. The struggle between capitalist and working class dissolves and transforms its collective entity into the social process that is different from the structure. Foucault identifies the subjectivity that is contingent upon the requirements of cultural and political structures as differentiated from the interviewee on the description of subjectivity. For Foucault, subjectivity has no absolute, universal or consistent content but it come along a regular position in cultural position and social life. The interviewee's (s_2), interpretation is more akin to Deleuze and Guattari's radical argument that subjectivity itself does not exist. Deleuze and Guattari conceptualized the endless and multiplicities of interrelationship in the assemblages (Mansfield, 2000: 137). The focus on the self by interviewee can be assessed to understand the modern to postmodern cultures.

The new conceptualization of labor or subject itself is tried to point out the ambiguity of the social sphere that put forth the fragmentation and decentralization. The interviewee takes the subjectivity in the social process rather than the social system. In addition Kristeva stress the same issue with the interviewee that the subject remains in process to be trying to establish itself and always challenge its limits. The subjectivity is theorized as incomplete and discontinuous, as a process rather than a fixed structure(Mansfield, 2000: 83). While such a characterization on subject can be

touched upon by just this interviewee, the other interviewees are using the tools of the modern theories.

Other interviewee (en_4), evaluates the labor and capital in the contradiction that should be required the examination for the capitalism as regards the technology that leads to the diminution in live labor existence in order to build upon the control mechanisms on the labor in the production. For this reason technology is the product of the class struggle. Marx sees the technology as fixed capital that shapes three effects dialectically. These are the constant decline of profit produced by technological innovation, the general depression of wages and the decline of the proletariat into a state of absolute impoverishment(Abbinett, 2006: 88). The interviewee (c_4) mentions about the production without factory or getting smaller economic scales in which the category is not bourgeoisie as urban residents but the small artisans are becoming proletarian or the doctors are becoming proletarian because they do not have control on their labor own by own. The market relations has been penetrated into the health sector day by day in Turkey and their labor is controlled and it means to lose the status of doctor in recent years. The argument has a structure that manifests the increase in labor subjected to the capital. In other words, the technological advancement nurtures this dependency relation of the labor to capital.

Another interviewee (g) assesses the class conflict over ambivalence of technology that which interest group takes the advantage from; the worker or the capital. The technology takes part in the capitalist society to be developed at any given epoch of a given society. The humanist or worker's benefits of technology should be emphasized that technology reflects the duality of capital and labor.

Freedman illustrates this dual relationship of technology that the internet technology is as natural ally of liberal democracy and is used to legitimate the free market and provide the commercialization of cyberspace but at the same time, this line of development is given to public status in which an electronic public library, a public sphere is independent of both state and market and this civic space allow individuals and groups for public benefits and not private gain. (May, 2003: 184) In this sense, the dual position of technology has increased the struggle between the labor and capital. The interviewee remarks that the continuous struggle between labor and capital has arisen, the class conflict which is made possible the identification of labor as commodity, continues on facets of unequal relations. While the cultural sphere expands its domination, the new proletarization is emerged in the urban sphere. The expanding of the cultural sphere leads to conceal certain domination relations and the contradictions of capitalism. This condition has trivialized the class conflict as minor. In Turkey, the human rights or cultural rights are seen as new arenas for the freedom but this emphasis on them complicated to perceive the proletarization process and the new domination relations. Moreover people can not have authority on their labor as

result of the surveillance technologies and the newly emerged technologies in the production. The labor is getting more sophisticated in the system of control. Goker mention about the future of labor and worker that today lots of worker is going out at the end of the shift, in the next century, 10-15 people will be appeared at front of the factory(1994: 20). The factory will be also disappeared in this century. The mechanical systems will carry out the process instead human. The interviewee has emphasis on the workers position are unable to claim their powers and satisfy their needs within these conditions. The consumption of cultural products, the individual construction of identities and the demands on cultural rights is rooted to obscure the class conflict. Another interviewee(en_5), agrees that the basic contradiction between labor and capital is completely going on and does not be ended. The neo-liberal economic politics requires free capital circulation, global division of labour and the free mobility of labor. The circulation of commodity and trade come true instead of the mobility of labor.

The labor market is still not free on the basis of late capitalism. The technology increases the surplus value and revalues the capital that sharpens the contradiction between labor and capital. In other words, the reproduction of surplus value comes to depend on the increased speed of production that is provided by the use of new machinery. The inability of mobility of labor is one of the reasons for the crises of capitalism. The basic feature of capitalism as a mode of production is the labor-capital relationship that interacts with the direction of technological development.

The machine decreases time for worker and the cost of subsistence level of worker. However it leads to the devaluation of labor power and also replaces the workers and the physical existence of workers goes down in the factory. Ansal argues that the technological development serves the economic, politic and ideological of interest of capital and capitalist technology is shaped by these interests(1986:169). The demands of the capital determine the design of technology. The workers are ruptured from the production sphere, the knowledge of the production and has no any control on the production process rather are controlled by means of technological devices. It is assumed that the contradiction has been disappeared or weakened through the mass production and cheapening of subsistence level and the possibility of employment.

For the Frankfurt Marxist Humanists, capitalism is developed into the system that is able to sustain growth and full employment and all of these weaken the internal economic contradiction of capitalism(Edwards, 2007: 56). This approach undermines the class struggle and the surplus is given to more people and the distribution of surplus, the increase in productivity by means of new technological development, has occurred in more rational way. In this sense the class conflict lost its base on getting to the power. The main centers of power are just not only capital, labor but also multiplied to gender, ethnicity etc. The modern mechanism of power would be destroyed and the traditional account of the class struggle has been demolished.

The expectation from masses to revolt for more liberation is too optimistic view to understand the struggle. The alternative channel to demand for the liberation can be constituted. According to Hardt and Negri the internationalization and globalization of relationships beyond national colonial and imperialist divisions is referring to the construction of Empire and the desire was set in motion by the multitude. The construction of Empire and its global network is a response to the various struggles against the modern machines of power and class struggle driven by multitude's desire for liberation. The multitude is called Empire into being (2000: 43). This view is differentiated from critical thought that the dominant countries of capitalist development and subordinate ones that have the resistance mechanism against the dominant countries to be organized around the national and regional groups and the other critical point is to develop the tools for the resisting against the foreign/global capital and the capitalist domination is ensuring the widespread acceleration within globalization that leads to localization of the struggles and this local resistance mechanisms conceal the contradictions of capitalism. The globalization is defined as a foe. In contrast to that the conceptualization of Empire by Hardt and Negri hold the different ground.

The Empire is a specific regime of global relations rather a foe. The local is defended in the critical views by this way, the liberation and the real alternatives are obscured. The Empire involving the ways of liberation and the real alternatives confronts homogenizing and heterogenizing flows in all its complexity on the power of the global multitude (2000: 50). While the 'empire' interpretation is examined the relationship between the power of the global multitude and the locality of resistance complicates the analysis of the class struggle. The borders of modernity have been exceeded by the conceptualization of Empire that bears the characteristics of post-society and this involves the interpretation of the self-driven technology (autonomous).

The class struggle is no longer to exist. Because the expansion of the capitalist production has transformed the proletarian struggles and the international cycle of struggles relied on communication(Hardt and Negri, 2000: 54). One of the interviewee (s_1), agree with the end of the contradiction that there were a contradiction between the labor and capital in 1700's because of the unemployment problem for emergence of new technologies in these years, but after the 1990's, it can not assumed that there is a contradiction between labor and capital, the flexibility of the work, labor and capital can provide vanishing of the contradiction.

The flexibility can be illustrated that person does not have to work in the same sector to whole life, s/he have capability to change her/his job easily, the capital is also flexible to promote and accelerate the expansion of investments across the world. The interviewee (td) evaluates the class struggle in pragmatic way that the labor or capital should be revised to be harmonized with the conditions of capitalist market in which hierarchical and unequal relations has dominated.

When trying to infer from the capitalism on basis of power relations, the globalization is playing its role as the debate on internationalization, imperialism or new international division of labor. It can certainly be recognized that the technology deepen the unequal conditions of core and the periphery of world capitalist system under conditions of globalization. Wallerstein defined the modern core-dependency hierarchy as an asymmetrical division of labor between producers of highly profitable core commodities and producers of much less profitable peripheral goods. Moreover he restated a new category as the intermediate zone, the semi-periphery(Ritzer, 2005: 375). The production and consumption of technology are connected with the position of the country as core or periphery. Turkey has dependent characteristics on the production of technology to the externality and is taken into account as the consumer country. Somel argues that core countries have the control on the technology excluding fixed capital and this occurred through the difference in human capital between the core and periphery countries(2001: 70). While the gap between the core and periphery is increasing with qualified labor the technological innovations produced in the core, will be become much more difficult to copy and imitate.

The quality of labor pursues the dependency relationship of Turkey as a periphery country. For Wallerstein, the ability of core capitalist and their states to exploit peripheral resources and labor has been a crucial factor in the competition among core contenders and the resistance to exploitation and domination organized by peripheral peoples(Ritzer, 2005: 375). Wallerstein clarifies the dependency relations on the basis of national borders in regardless to the decentred labor.

The space and time restriction is outdated on the labor within the information technology. The interviewee (C_2) claims that technology does not change the centre of the production process on the basis of the globalization. Although the production process has enlarged and become spread across the third world or periphery countries, the integration and the design process of technology are carried out in the core. When some software is produced in the India the domination relations on the technology do not change and the periphery countries are just the users of technology. The technology developed in the core countries is tried to transfer to the periphery countries within the opportunities that are related to human capital, the capital accumulation of the periphery country. According to Ansal, the multinational companies that are developing technology and has been retained its monopoly position diminish the financial power of the developing countries as a result of high cost of the foreign technology purchase. This dependency condition has negative impact on the transfer and the adaptation of technology. The choice for the solution is compiled that the choice of technology better, to understand technology provides the increase the negotiation power in market, to reach the capacity to the adaptation of technology in the local.

An interviewee(l_1) explains the influence of multinational companies on the development of technology in Turkey that the multinational companies can not have any impact on the trigger in the development of technology in the national level. The multi-national companies aim's is to utilize the resources from which are cheap labor, in the vicinity of market, the flexibility of regulations of the country. The multinational companies legitimize itself to bring the capital, technology and employment to the countries that attract them. The developing countries is facing the paradox that the possibility of technology transfer is occurred by means of multinational companies and the dependency relations between core and periphery continue on the unequal position in the market exchange because of the differentiation of capital accumulation. It is assumed that multinational companies trigger the local development of technology and the technology transfer is inevitable to reveal this advantage of multinational companies.

According to Pamukçu, after 1980's, the state encouraged the foreign capital invests that has not empirically positive influence on the manufacturing to be renewable in Turkey (Pamukçu, 2001: 85). In other words, the improvements in the production sphere cannot be observed on the bases of technological development in Turkey. One of the interviewee propound that the critical point is the establishment of research laboratories of multinational companies in the local area. The imitation or copy of technology can be much easier to transfer the technology in an efficient way by means of research laboratories in the locality. If the technology transfer contracts concern the commercial development of technology that come into the import path, the exterior position of developing countries to technology is continued.

Turkey is just the users of the technology rather the producer. In the context of the technology transfer, the intellectual property right is critical for developing countries in which the legal regulation on intellectual property right is implemented by the pressure of the developed countries. Jessop argues that the importance of knowledge has increased as fictitious commodity in shaping the social relations of production (2009). The knowledge produced the resources and where the intellectual property is generated in the capitalist condition for profit. The question on the exchange value of knowledge appears on the difference of technology transfer between the core and periphery countries. The intellectual property is privileged and the market-led determination of knowledge exchange value creates new hierarchies in the global level.

On the other hand, the chain of dependency is broken within the new ways of technology transfer by the state that put some restrictions on the legal regulation of technology transfer to get advantage in the market. For Pamukçu, the state in developing countries took the strict precautions to decrease the cost of the technology transfer. Especially the South Korea applied this method. The firms in developing countries try to import the capital commodity used in the international best

practice and related some element to develop technology that are not transferred by multinational companies against the precautions(2001: 87).

This condition brings the negative effect on the technological development process in the developing countries. If the developing countries whose have import substitution oriented policy, prefer capital-intensive technologies to be transferred, the complexity of transferred technologies and the monopoly characteristics of international market, the successful results from technology transfer is not achieved in these conditions and it has brought additional cost. The technology transfer is examined in the analysis the property relations and the relative dominance relations of core and periphery countries. The exceptions can take place in the debate of the dependency theory in which the South Korea Japanese achieved the technological development by means of the technology transfer whose rules are constituted by the independent understanding of technology by the state. A problem with proclaiming the decision maker role of the state in the innovation policy that is shaped by the demands of the military industry. Because the emergence of the technology has the consequences of defense needs. During the World War II, the intense cooperation between science and technology changed the direction of military-industrial complex that had an attack on masses.

The technological superiority can be observed in the constitution of the innovation policy. One of the interviewee point out the dependency relations that In Turkey, the consumption level of technology is related to the requirements of defense of country that is dictated by NATO, US. Turkey can not develop the new technologies in the defense by itself. The dependency relations prevent the position of Turkey from the being an actor in production, consumption and the reproduction sphere.

In addition to that the global market is a decision maker of the innovation policy in the periphery countries. The international market actors determine the area of the technology which is privileged by the national state in the periphery. It is called global imperialism. The dependency logic is inherently same in the industrial revolution and now it can not be altered during the examination of the market relations in the global level. The ironically some resistance mechanism are constituted and the strategies are generated against the dominant relations in the market. The alternative technologies such as health technologies are produced in Cuba. The technology embodies the contradictions of capitalism and the alternative way of resistance mechanism. The technology contains the set of inherent ambiguities that brings new possibilities for freedom as well as dependency and control.

The technology represents the alternative way of resistance and social movement activism against the globalization and neo-liberal ethos such as World Trade Organization. This is called global civil

society, it can be illustrated that the parallel summits such as the 2001 Porto Alegre meeting in Brazil attended by 11.000 people to protest against the Davos (Switzerland) World Economic Forum. In this organization multiple networks of social actors and non-governmental organizations are the result of access to powerful globalized forms of communication (internet) and organizational tools to increase their capacities on the local and international level (May and Powell, 1996: 268). The organized and linked social movements operated through transnational networks take the ironic position to affirm the solidarity on the global issues.

On the other hand, the social movements have capability to gather and organize people of similar goals via internet that loses their base of support in the organizations because of becoming out of touch. In this sense one of the interviewee claims that the new alternative media such as internet ensures an inability to struggle against the monopoly of knowledge alone. The monopoly of knowledge refers to interest having extraordinary control over what information available and possessing the impact on more complex patterns or habits of social thought (May, 2003: 94). If this the internet-based networks would not involve into the decisions of the local social movement, this movement turns to the tourism of social movement. S/he uses an example from the class movement in which the full benefits of technology can be got to transform the society on the base of class movement.

The process in relation to the social movement has been accelerated by the technology. The class-based movements by the help of technology can strongly oppose to the capital. On the other hand, some social scientists are assumed that the recent debates on the class movement has altered into differentiated movements and the new social movements has been decentralized into parts such as feminists, ecologists, identity politics of race, ethnicity and sexuality.

The primary reason for the constitution of new social movements is the new processes of commodification bureaucratization and homogenization create a growing politicization of social relations and the dissolutions of old solidarities and forms of community.

These processes create new forms of resistance and antagonism that are expressed in the new social movements. (Laclau and Mouffe, 1985: 112) This kind of the interpretation leads to the trivialization of the class movement and put the class struggle into the secondary position. The conflict areas on the new social movement interact with the technology that builds the new struggle tools and arena to be resistance mechanism. The technology is becoming an increasingly important tool to create new media for the social movement. The decentring operation of social movement has an impact on the new media for the resistance. The decentred social movements force the pace of change in the technology in order to form a new media for the resistance.

One of the interviewees (en5) argues that the content of social movement has been voided on which the disappearance of subjectivity can be influenced and the technology has also played a role on the acceleration of process on the void of context. While the most compelling driving force behind the social movement is not the social action, the human intervention is no longer to exist and there is no category as human. In the postmodern divide from modern, this radical fragmentation of subjectivity is the individual subject into multidimensional set of radically discontinuous realities (Clarke, 2006: 130). Whereas the modern perspective assumes that the ideas about individuality is naturally occurring unit that is harmed and ensnared by society and the rejecting the social pressure can provide the true freedom and fulfillment for the individuality inhibited expression.

For Foucault, Rousseau's free and autonomous individual is not merely alternative in theory of subjectivity. The subjectivity does not have the interior structure. The subjectivity is everywhere a position in a field of possible behaviors built by power/knowledge(Mansfield, 2000: 18). In accordance with the radical fragmentation of subjectivity, it can be considered that the subjectivity has no more centers and is immanently constituted by dissimilar points and the decentred subject can not have ability to provide the organization of the social movements again. But the social movements could be seen as a response in collective sense to felt sense of injustice or be against a totality.

The complexity of the contemporary social movements is arisen from the debates on the subjectivity, multitude of identity and the capitalist relations. To what extend the subjectivity and the change of social movement related to the technology directly. The technology is a tool to expand the social movement not only real but also virtual sphere.

The increase in communication media renders the social movements more visible, mobile for the protesters. The interviewee(en2) argues that it was difficult to establish a good organization in the past, the greater access to people had difficulties in relation to the limitation of communication media. Today, the social movements allows for quick and broad dissemination of information. S/he makes an analogy between TV and social movements. In the past, TRT channel (The Turkish Radio and Television Corporation) had to be watched in one channel period, the direct participation of artists in the TV broadcasted programme series were important because the mass audiences had to watch just these programmes. After 1990's the number of television channel has increased to 300 over time in Turkey. The increase in the number of television channel provides the audience a range and choice of programmes that leads to the exposure to stimuli more. The television programme is prone to ever more rapid devalorisation rather in the one channel period. It is considered that the social movement has increased and the limitation of time and space is ended within virtual sphere. It becomes harder to bring people together people in the real sphere. The

social movements attempt to generate new wave for the resistance that is not as powerful as the older social movements.

This part focuses on dependency relations in the global level and social movements. The technology has led to increase in unequal exchange between countries and has brought the possibility for organization of social movement easier. In the next part, the relationship between woman and technology is examined in terms of the social inequality.

4.4. Gender Perspectives on Technology

A special emphasis is put on the gender issues related to technology in this study for various reasons. One of the main reason is the debate on the autonomy of the technology pertained to the contemporary social position of women in the society. Whether the technology produces and sustains the unequal position of women or the technology has capable to change the social position of women in the society is the real problem. Some social scientists argue that technology will make advancements in all fields for both life and women. In this chapter, the issues on woman and technology are examined on the economic and cultural sources of women's oppression.

While the gender relations and technology are evaluated, the dynamics of social change figure out the production, reproduction and consumption of technology. In the production sphere, women's work has low status and is usually labor –intensive. Brush argues that men's productive activity is evaluated as historically and financially but women's reproductive activity is conceded as private and has non-pecuniary rewards(Brush, 2005:163). The position of men is described as the breadwinner of the family and woman's work contributes the budget of the family as pocket money. The capitalist relations and the patriarchal relations are taken into account to understand the social position of women and the technology.

First of all, women's work has changed traditional manufacturing to informational technologies. For instance the tele-working, which provides flexibility in working location and hours, becomes widespread. Cockburn claims that computer-aided design and cutting methods in the clothing industry increase the labor processes and this method of production requires computer literacy and some knowledge of programming(Mitter and Rowbotham, 1995: 31). The interviewee(g) mentions about this issue that there has been skill-biased technology and technology creates new field for special abilities. Access to relevant training especially engineering training is difficult for woman for the traditional relations. For this reason some jobs are categorized into sex; woman and man.

In Turkey, the division of labor has been explained by means of the gender relations. This problem should be solved by public policies that will be produced in taking the existing unequal position of

woman into consideration. While woman perform the repetitive and standardized tasks in the advent of computer technology, the man enable to choose jobs to get greater economic advancement and social power. One of the interviewee (td) points out that woman has been forced to prefer technology related tasks which are not chosen by man because of the low-status jobs. For instance women are employed as data processing workers by the multinational companies.

When woman takes part in labor force market in the Third World, the increase in autonomy of women is emphasized positively. But this condition can lead to the emergence of international exploitation system for women. Traditional labor process has been challenged by the requirement of technical knowledge in the labor process amenable to deskilling through the automation. While the new technology skills are being polarized by gender relations, the capitalist system becomes the labor force participation of women fragile. According to Marxist Feminist Analysis, the capitalist relations shape the patterns of women's employment. The capital-labor relation shapes lower pay and lesser labor force participation of women in the production sphere. For this reason subordinate, marginal category of worker is women and they are vulnerable to expose to greater exploitation by employers. In addition to that Bravermen conceived women as long term reserve army of labor, the woman labor is used to develop the capitalism and contemporary monopoly capitalism leads to a progressive deskilling of the job(Walby, 1990: 9-10-11). It can be considered that the advancement of the technology brings deskilling of the operations in the production and devaluation of labor. The emergence of the new-less skilled jobs is conditionally belonging to women as reserve army of labor. This means that women's labor is accepted as secondary, invaluable and deskilled and the technology can deepen the existing unequal positioning of women in the labor market. (Walby, 1990: 76)

In the global market, technology creates new areas of interdependence for the world economies. Especially the free flow of the capital and the rapid growth of world trade increase internationalization of production and the rapid expansion of multinational corporations. The seeking for the cheap labor is enabled to benefit from the information technology. Woman is reconstructed into the global economy as suppliers of cheap labor**.** The labor is partially freed from the time and space boundaries for some sectors in terms of information technology. The multinational cooperations use the women's labor as cheap labor integrated to global capitalism that leads to marginalization and oppression of women's labor. (Peet and Hartwick, 2002: 261)

It can be considered that the unequal position of women in the labor market is an advantage for the capitalist accumulation in global sphere. According to Moghadam, the surplus extraction of labor is required to attain the capitalist accumulation. Beside the class and regional differences across economic zones, the paid and unpaid economic activities of women can be one of the driving forces of the world system for the global accumulation. It is gendered processes in the sphere of the

production and reproduction. The participation of women in the global economy and in national labor forces provides question and change gender relations and ideologies. (2005: 153)

The interdependency relationship between the woman and technology can present the unequal position of the women in the labor market. The technologies of production, reproductive technologies and domestic technologies build upon the cultural environment of the women. The cultural environment entails the representation of patriarchal system. The patriarchal system enables to define the unequal position of women as unpaid worker, factory worker or data-processing worker of multinational corporations in Third World. Socialist Feminists argues that woman use its labor as unpaid and reproducing labor power as a kind of subsidy for capital and producers of the commodities for employer demand in factories. It means that women are super-exploited as working class. The patriarchal capitalism acts as conduit of the reproduction of the system itself.

One of the interviewee(c_4) reminds us the reproduction of patriarchal system via visual media. When the first mobile phones took part in the market of Turkey, the image of the mobile phone advertisement is male who wears business suit and bond bag. A man, who held high status job in the advertisement, represents the target group for mobile phone at the first importation in the Turkish market. This example demonstrates the immanent pattern of consumption on the basis of low labor force participation of women in Turkish Society. This way of advertisement can be contributed to a medium of dissemination of patriarchal culture and technology receives the existing culture and reproduces the inequalities on visual media. This advertisement can be interpreted that it represents the latent adaptation of women to technologies or woman has disadvantaged position to access the resources of the technology. Another remarkable example is the advertisement of the internet in Turkey, Banu Alkan, a blonde artist, played the role in the advertisement of the internet and she asked if you could make a website for her. The representation of the woman on the media emphasizes her inactive position not only to consume the technological product but also be able to use the technology itself. Among television characters and in motion pictures there are too few women represented as professionally competent in using technology. In fact, the popular culture images of women are either whores or virgins and villains or victims obtain on the TV or the internet. (Wyer, Barbercheck, Giesman, Ozturk and Wayne, 2001: 95) According to the interviewee, women's representations on the media figure out the social position of woman in the real life. The patriarchal relation prevails within the community in which technology is articulated to the social system by nature. The technology can be perceived as tool to discern the social inequalities of system and structure.

On the contrary that cyber-feminist theory argues that the industrial technology can have had a patriarchal character but the digital technologies have able to liberate women because gender and

technology are mutually shaping. Cyber-feminists illustrates that the internet is perceived as the ending of sex difference and causing of a multiplicity of innovative subjectivities. The traditional hierarchies can be abolished and horizontal diffuse, flexible networks are substituted with women's values and ways of being than men's. (Wanjcman, 2006: 12)

The other interviewee (e_4) agrees with the cyber-feminist that the gender inequalities do not embedded in the technology-use. The information technologies seem to have feminine characteristics. The feminine characteristic of information technology is related to the use of computer. It does not require the brute force for using the computer. The interviewee argues that the feminine characteristics of information technology can contribute to the liberation of woman. But the interviewee overlooks a critical point that the concept of gender consists of the range of biological and social difference between woman and man. The biological difference can not adequate to interpret the complexity, the mixture and the interpretation of relations between women and technology. The gender inequality consists of not only the biological difference but also cultural difference (embedded into patriarchal structure).

On the other hand, the interviewee (td) examines the relationship between the education and gender difference in Turkey. The data has been varied on the basis of the school enrollment in the level of the education by female/male students. The interviewee (td) points out the Status and Trends of Education Study in Turkey conducted by World Bank. This study indicates that there is a deepening gap between female and male students in the primary school or secondary school rather than in the university. In the other words, the gender difference between the man and woman has been closing down in the level of university. If women get higher education they can access to technology in more equal way. In this sense, the technology can play a beneficiary role to diminish the inequality of gender. The interviewee (td) overemphasizes the role of education in explaining the causality of unequal position of women in Turkey. The overemphasis of issue on education of women is complicated to understand the cultural and economic motivation behind the inequality of women. Especially the interviewee neglects the gender relations on the examination of women's role in conflicting culture of patriarchy.

The patriarchal relations are also embedded not only in the institutions but also other social relations in Turkey. Walby (Delanthy and Işın, 2003: 339) describes male domination of woman by utilizing the existing patriarchal structures that are six key structure; the patriarchal (domestic) mode of production, patriarchal relations in paid work, the patriarchal relations in the state; male violence, patriarchal relations in sexuality and the patriarchal relations in cultural institutions, including religions, media and education. The interviewe (en_4) argues that both education and technology can contribute to the improvement on the women's unequal position. The interviewee

assumes that technology brings the dominant form of the gender neutrality and liberates the woman in the education sphere.

On the discussion of gender inequality, the cyberspace is crucial to describe the cultural impact on the social inequality in the digital era. The dichotomy between the reality and virtuality is related to the representations of the social world. The virtual can be explained as appeared to exist by the use of computer software that provide new patterns of social relationships built around related values of community. The values of community have constituted to reveal the imaginary face of the new social relations. Shilling defines the cyberspace is a broad concept that is related to computer or electronically mediated communications which produce information space or techno-space. In the virtual places, people have complex interaction or access information without any physical boundaries(2005: 180). The interaction has been freed from the time and space within the introduction of the concept of cyberspace. The cyberspace is produced through the multi-media communications, the internet, the digital television, mobile phones etc.

The early discussions of gender inequality are captured in the subtitle of capitalism and patriarchal relations, but there is meaningful relationship between women and cyberspace that is interpreted by some social theorists. Haraway sets out a subsidiary framework that cyberspace is reckoned to be the medium through which to look into the concepts of emancipation, empowerment within transcendence of physical subjugation. In recent years, the internationalization of production and the dissemination of multinational companies lead to weaken the national state boundaries within the development of the global economies in which flow of money is freed from the control by national governments in the cyberspace(1985: 83).

Even Haraway has a positive approach on the techno-science and a critical view on who reject technology. She prefers to be a cyborg, which is a hybrid of organism and machine parts and takes in the great power of science and technology to create new meanings and new entities. Moreover, the advent of virtual reality is perceived as challenging traditional notions of gender identity. (Wanjcman, 2006: 12) For this reason it is considered that Haraway as cyber-feminists see new relationship between women and technology in oppose to the traditional relations in an optimistic way.

One of the interviewee (c_4) disagree with Haraway that the virtual reality can protect the gender inequality in the cyberspace as the same as in the real life. For instance the World War of Craft is a massively multiplayer online role playing game in which the players can interact with each other via internet, the players have able to use and change the different social setting in the cyberspace. But the social settings can be constructed by the players in an irrational way that the unequal position of women has been overstressed in exploring the new locations, creating new characters

and their roles as an imitation of real life in the patriarchal social setting. For this reason, the virtuality is not able to cope with dissolving the patriarchal organization of life and the breakdown of the social class.

The social difference defends its existence to reproduce the social sphere through cyberspace. For all that the interviewee makes mention of Ursula Le Guin that has reversed the question of the binaries; man/woman, superior/inferior oppositions. The feminist face of the book conveys the relationship between man and female hero that exist together within the pattern of the adventure. Man still plays his role as a wise-man and has power on nature. In spite of the fact that woman still plays her role in a witch to use her senses and natural forces. At the end of the book, man would share his power with his daughter and wife. This part of the book deconstructs the gendered power relations. Nevertheless the virtual milieu involves the inequality in itself. The virtual milieu reconfigures the social sphere on the interrelationship of technology and gender. The gender inequality remains among the social relations and reproduces itself through the virtual sphere.

On the other hand, the design of technology comprises the male domination in which man produces, develops and utilizes new technologies. One of the interviewees argues that the design of technology, positioning of the workplace in a technological condition reflects the male dominant system in the society.

Patriarchy has become completely intertwined with the production, design, and use of technology that we cannot realize the patriarchal structure among social sphere. The technology can be seen as neutral at all. However, this structure can be concealed in the design of technology, the interrelations of technology and women is attempted to interrogate the patriarchal system. In challenging circumstances, the internet user who was female rose from 20 percent to 39 percent in China and in Western Countries there is no gap between woman and man in related to the ownership or access to the mobile phone. In other words this artifact is not culturally coded as feminine or masculine among younger people. The exposition of women to technology provides them as user-friendly. At the same time it cannot be considered that women can include in the interior process of technology production per se. On the contrary to that the typical pattern of use is determined by innovative female users rather then male designers (Wancjman, 2006: 11).

The designers are man and the products are designed male dominated and the users are usually are woman in some sectors. One of the interviewee (g) illustrates that the domestic technologies such as; washing machine is produced and designed by man who imitate the usage of woman's movement in the washing the clothes or dishes. If the technology has a potential to be commercialized, man will bring in the production and distribution of the technological product.

Man has included into the process of taking profit from the technology on the field of related to women.

On the other hand, the other interviewee claims that the exclusion of women from technological sphere can be interpreted as a positive context in order to be emancipated from the world hegemony of capitalism. The contradiction of capitalist system gets into the cultural circuit of the society inherently including the gender relations. The technology is a tool for which general system of the hierarchies exists as a set of relations between the social, political and economic sphere. Capitalism is related to a replay of Taylorism, raising new kinds of managerial and worker bodies that are adjusted to ambiguous and slippery of the cultural pattern. In this way, a new and vibrant set of markets for capitalism is constituted by the cultural circuit (Thrift, 2005: 15).

The technology reinforces the interrelationship of the capitalism and cultural circuits that involves the gender constitution in society. For the interviewee(l_2), women, who can not work in relation to technology-use or have any relationship with technology, means her possession of raw unpolluted soul in order not to interact with power relations under capitalism. The lower interaction with technology worker has the lower exploitation level of capitalist system the worker is exposed to. In the contrast that the interviewee accepts that technology enable us to exhibit and coordinate the resistance mechanisms against the capitalist and patriarchal system more easily.

The interviewee does not imply that woman should not participate in labor market/production. The capitalist system alters the focal point of the exploitation to use the improved technology, underline the centralized control feature of technology. It hides the real truth of class struggle. The other interviewee argues against this view that labor force participation of women contributes to ease of access to new technology with which society can experience the decrease in gender inequality in the long term.

It can be argued that the technology is not a determinant factor in the gender relations. Foucauldian conceptualization has been used by the interviewee. Woman is involved into the homogenization of docile bodies later rather atomized, individualized man earlier. Borde argues that the management and discipline of women's bodies has embarked upon later and take more time than man. The reopening of the public arena to women intensifies the discipline of body come along with diversionary and subverting(1993: 166). In this manner, female bodies become docile bodies in which external regulation, subjection transformation, improvement are accustomed the normalizing forces of body. The interviewee(e_4) exemplifies this condition that woman reduces their ties to her children and her husband at minimum level, rather increase in her dedication to the work. The docile body of women is exposed to the normalization procedure by the modes of domination.

The interviewee (S_3) makes inferences that the production of socially trained docile body of women is presented as the project of gender emancipation. Although the prevalence of physical violence is no longer more evident among woman, her body becomes docile, this becoming docile is a movement for making woman inactive. In Foulcauldian analysis, it indicates the end of the subjectivity that has not a fixed and knowable content or does not exist outside of the demands power places on the individual bodies. The concept of Foulcault's power does not leave any space for subjects to resist and give any hope for emancipation (Mansfield, 2000: 51). The concept of power disempowers those subjects both man and woman at the same time. The death of subject is examined in the conceptualization of gender and technology.

In sum, the relationship between woman and technology is interpreted in the two spheres: cultural and economic. The patriarchal and capitalist relations are significantly meaningful to understand the unequal position of woman. In addition the emancipation of woman by means of technology can seems to be difficult. The technology and gender inequality has been examined and the technology is a tool for strenghtening the unequal position of women.

CHAPTER IV

CONCLUSION

This study has been conducted to discuss the social dependency of technology and attempted to develop a critical perspective on the autonomous of technology. It is argued that the technology is socially dependent and its reflections are constructed through social relations. The dependency and autonomous of technology and its relations with social sciences are assessed critically in the third chapter. The dynamic characteristics of technology referred to social change and transformation are accepted as rational, uncertain risky, contingency. The contradictory nature of these characteristics is examined in the fourth chapter. In the fifth chapter, it involved that the relationship between capitalism and technology is evaluated on the basis of global processes and the reflection of technology on gender relations are analyzed.

In the first chapter, I discussed the critical evaluation of key differences between two or more schools of thought in the autonomy of technology and technology as socially dependent. The field research has been carried out to shed a light on the analysis of technology in Turkey. The views of scientists give some clues on the social dependency of technology. I criticized the one-sided effect created by technology on the all spheres of society. This view evokes the technological determinism which comes to mean that new technology alone rules and imposes its imperatives and its demands on human. In this sense, the social relations has been neglected in the production, consumption and reproduction of technology and this neglect has been dominated the technology over the social and political sphere. In this study the social political and economic sphere are evaluated on the basis of technology and the hierarchical relations between these spheres and technology are refrained.

The technology is sometimes conceptualized as the machine used to explain the contradictory nature of technology. The features of machine are related to reduction of labor time, the improvement in the working conditions (unhealthy and unsafe tasks), cheapening the subsistence level, the decrease in wage and the rise of unemployment. In this sense, the machine reflects both positive and negative aspects of technology. The right question should be asked is who benefits from it and who is able to use/own it. I argued that the technology is not inherently positive or negative entity. The hierarchical relations alter the meaning attributed to the technology.

The hierarchical relations refers to the contradiction between the capital/ labor, ruler/ruled, owner/unowned or with/out power. Foucault analyzed the power without centre in the contemporary debates. What is the limit of being social? In general view, the raw materials and technology are tools for the domination of nature by human beings. The history is considered as an outcome of creative human actions. In this context, people both generate a social world and give meaning to it. Recently, the new conceptualization of technology has emerged. The modern constitution of science and technology are extra human and in fact they conceal the multiplies of intermediary that are fully human or non-human(Lash, 2009: 3). This kind of discourse is to open a new fronts on the unit of analysis that are not just consist of the human in the study. It is indicated that the boundaries between the subject and the object have changed in the contemporary perspective.

The modern episteme implies the fundamental split of modern between the subject (internal) and object (external). The distinction of human and non-human is seen as vague in Latourian analysis. The human (society) and non-human (nature) are connected by language in contrast to the division of society and nature in the modern episteme (Latour, 1994: 793). When I examined the data of the field research, I acknowledged that there have been major interpretations on the conceptualization of power in relation to technology. Some interviewee argues that the power relations are linked with the capitalist relations and the technology seems like an instrument for control and domination and the imperialist expansion of technology. This way of thinking is build upon the data from the field. This manifests the technology as a dependent position to exercise the power on the basis of knowledge and dwell on the economy politics: capitalism. The needs of the capitalist market shape the dissemination of technical control.

On the other hand the level of knowledge can change the position of the domination. For Foucault the discourses of knowledge are merely tools in the dream of power to totally organize the human population (May and Powell, 1996: 59). In other words, knowledge is the prime instrument to exercise the power. Foucault describes the transition from sovereign power to bio-power centers on which the new political subject operates through the governance of variability of biological life and new political subject aimed at involving a regime of power (Goldman, 1999: 31).

According to some interviews, the capitalism exercises its power on our molecules rather our brain through the technical control. It can be agreed with that the technology finds its way to diffuse into the body through the capitalist relations. Moreover, the contradiction of domination relations conveys itself through the biological determinism or new ways of technological determinism. The dramatic changes in the genetic technologies bring new possibility for the artificial organs, implantation of organs and discovery of stem cell. This can be accepted as the capitalism by means

of technology is for controlling our bodies. The actant position of human has been diminishing and the individuals could not do in a resistance to struggle against the domination relations.

The other argument is that the technology creates a kind of imperialism provided by newly emerged communication technologies. If I identified the technology in its autonomy or resulted in a new kind of imperialism, this view would get a labeled the technological determinist. The technology provides its control through the monopoly of knowledge. The monopoly of knowledge refers to possession of extra-ordinary control over what information is available and having predominant impact on the more complex patterns or habit of social thought (May, 2003: 94). I can make inferences that the new technology constitutes its monopoly of knowledge that creates new hierarchical relations and engenders the approach on the newly constitution of technological determinism.

The increasing emphasis on technological determinism is reduced to the hegemonic power propositions that are representation of universal economic rationality. In other words, the technical efficiency serves to increase the maximization of the profits and the instrumental rationality provides the control on the determination of needs in the society. Some interviewees touch upon the instrumental rationality of technology that includes the demand of market and the emphasis on efficiency.

The Frankfurt School concentrates on the technology and culture and how technology was becoming a major force of production and formative mode of social organization and control. The emancipation of people from all forms of power is important. It refers to free from the domination by market relations and from political relations of totalitarian control. This can be marked as the feature of contemporary capitalism. The technological domination is pertains to the cultural sphere. The needs of society has involved into the processes of cultural production. The rationalization of culture has power to analyze the social forms that related to the cultivation of false needs (Edwards, 2007: 24). In other words the culture manipulates the desire and channeling the desires around the false needs of autonomous subjects to provide the sustainability of the capitalist system.

In the capitalist system, the technology and culture produce the mass culture to individuals to conform the dominant patterns of thought and behavior. These thought and behavior are accepted as powerful instruments of social control and domination (Ritzer, 2005: 292). The autonomous subject is no longer to exist and it can be accepted that the subject is liberated from traditional bonds but the needs of system creates new dependency relations for the subject. The subject is exposed to newly emerged dependencies by means of technology. It can not be generalizable that the capitalist system dominates and controls all forms of relations and the technology is not just instrument for the control and domination colonization of the cultural sphere but also it can bring

new possibility for the constitution of resistance mechanism and networks against the existent system.

The other subheading in the third chapter is the examination of relationship between social science and technology. The analysis on the social science and technology can be divided into two parts in the light of interviews. One of the parts is related to the similarity of social science and natural science in accordance with using similar techniques during the interpretation of data, the other part involves how the scientific knowledge is constructed by the technology and its reflection on the social science. I realized that the methodology of social science is begun to resemble the methodology of natural sciences within the new technological advancement in the field of information technologies. I discussed the relationship between the social science and natural science that the quantitative methods are becoming widespread in the social science that the similar characteristics of sciences may be resulted in the demand of market relation. The contemporary social science has begun to be considered the positivistic studies important and the instrumentality of recent studies has emphasized at the same time.

According to Heidegger, the standpoint of the object or things has been fetishized by the proceeding positivistically contemporary social science. The social science has to be placed human reality rather than objectivity or thinghood at the centre of its phenomenological perspective (Wolin and Abromeit, 2005:15-16). Some interviews manifested that the market driven standardization of social science has emerged with the positivistic methodology by means of technological development. The other interviews assume theoretically that the goal of social science is to understand and interpret the social relations in a way. The social sciences have ability to play emancipator role for the individual and contributes to constitution of the resources for applied fields such as engineering. The demarcation of social and natural sciences is becoming vague. However the natural sciences continue its privileged position over the social science that applies the compulsory action to share the same methodology with natural sciences. In recent analysis, the methodology of social science is attributed to phronesis and *techne* that social sciences hamper the tendencies toward relativism and nihilism and the other kinds of peculiar methodology to social sciences never will obtain any significance as normal and predictive sciences (Flyvbjerg and Sampson, 2001 :62). It might be claimed that the quantized social science is connected with the great increase in exposition of market relations more.

The contemporary understanding of science is oriented to develop a method to obtain output that is often materialized as the technological product in a short time period. The technological product increases its commercial value in the level of significance. Some interviewees argued that the quantized social sciences are seen as ideological to conceal the contradictions of capitalist relations and legitimate the position of dominant class. It can be considered that the funding mechanism of

scientific research and the intellectual property rights is criticized that the ideology of dominant class and market relations have a reflection on the social constitution of knowledge. It has changed its structure along with the hegemony of information technology. According to Lyotard, the hegemony of computers has a suggestion to determine which the statement is accepted as knowledge statements. It is a through exteriorization of knowledge with respect to the knower at whatever point s/he may occupy in the knowledgeable process. In contrast to that older principle that is to obtain the knowledge in indissociable from training of minds or even of individuals is becoming absolute and will become even more so knowledge is and will be produced in order to be sold it is and will be consumed in order to be valorized in new production in both cases the goal is exchange. But now knowledge stopped to be an end in itself it loses its use value (Cooper, 2006: 97). The dissociability of knower and knowledge has been apprehensible to reflect the continued hierarchical and unequal relations of domination. I pursued a discussion on the new constitution of knowledge in accordance with the global capitalist relations in the fourth chapter.

The final chapter focuses on the relationship between global capitalism, social inequality and technology. First, I discussed the rationality, uncertainty, risk, contingency peculiar to dynamic characteristics of technology. The rationality, uncertainty, risk, contingency characteristics of technology has embedded into the debate on autonomy of technology. In the modernity sense, the meaning attributed to technology includes the neutrality and rationality. The technology has catalyzed the transition to modernity that is shaped by technology and the reverse is also true that technology is socially shaped or even socially constructed (Feenberg, 2003: 33). The technology is considered as the products of modernity. The uncertainty or contingency of technology are posed a treat on the rational, neutrality in the modern sense. The Enlightenment ideal of a rational society has been criticized to dwell on the uncertain, contingent and risky conditions embedded into the dynamism of the technology refers to the social change, reproduction and transformation. Habermas argues that the enlightenment on instrumental scientific-technological rationality has one-sided emphasis on the result that the system of economy and the state, technology implement its functional laws in all spheres of life (Feenberg, 2003: 40).

The other sphere is the social and cultural expression in which technology produces the uncontrolled uncertain and contingent positions in the control hysteria of modernism. The emergence of excessively risky uncertain factors can be independent from the human intervention in the process of technological development. While the technological development increases the contingency, it rendered the high limit control mechanism. According to Beck, the later stages of industrial modernity bring the economic growth; ecological degradation, industrial capitalism is producing so many negative side-effects (infectious disease such as swin flu) (Loon, 2002: 53). The values of progress and rationality are questionable as consequences of risk and contingency. Some

of interviewees place an emphasis of autonomous of technology refers to self-governing, self-controlling, and self-generating.

This concludes that technology is not subjected to any social relations rather has power to exercise over all forms of social relations. For Beck the promise of individualization defined as politically progressive force has fragmented in the sovereignty of institutional domains. This leads to de-politicization of the political and the political takes its place as class struggle in an industrial society, there is no more class struggle in the system and even there is the domain of governmentality in science, media and commerce (Loon, 2002: 42).
On the other hand, some interviewees criticize the emphasis on individualization and risk society has induced to the logic of free market. The ecological degradation, crises, diseases, risk are the result of capitalist relations. The perception of risk should be interpreted as the basic motive of profitability and competitive drive rather the evaluation of production and reproduction of technology. Loon illustrates that the new technological media claim to free speech and is seen as different logic; free markets. The mediation is a commodity and is sold profitably on ever-expanding markets (2002: 42). The capitalist societies restrain with the logic of capital and reduce all operations into financial transaction. All flows in terms of capital have been valorized. In this sense the moral judgment and everything is seen as commodity. The risks are transformed into opportunity in terms of capitalist system. In other words, the risks are diffused trough commodity relations that increases having power to exercise over technology.

The concept of 'risk' has strengthened its autonomous position of technology. In the light of the interviews, it can be assumed that the risk is the social consequences of disorganized capitalism. But other interviewees stress unexpected ways of technology in terms of concept 'risk'. The catastrophic future of society is generated by indeterminable character of risks and danger. If the technology has an autonomous entity, the control of technology will be one of the important problems of the modernity. The modernity and rationalization process of society have a promise for the liberation of individuals from the traditional bond. The technology bears the contradictory characteristic of modernity in itself and they are related to the contradictions of capitalist system in the light of interviews. While it is autonomous where the capitalism get into crises, unintended consequences of technology has been emerged among the society. The crises of capitalism legitimate itself through the perception of risks and generating the uncertainty.

Lastly, it is worth for a moment to consider the logic of technology and capitalism through an encompassing overview of global process in the final chapter. The technology If one looks at the way in which the western societies or core countries governs the periphery, it is clear that the technology, has been related to the social in a more complex way than in the past. The dependency relations of technology can also be criticized in this study.

The control of time and space became the central point of modernity discussion in term of globalization. The notion of informational capitalism is introduced by Castells who has emphasis on the timeless time and the flow of space. The newly defined informational capitalism requires the new way of thinking about power relations. While the power relations and unequal relations is bound to develop in a given time period and one place, the reorganization of time and space is opposed to the boundaries in the recent evaluation of information technologies. The one of the interviewees argues that it can accept the emergence of two classes as a consequences of the change in time and space. One of classes in which people have capability to free up more time for leisure activities and the other class category is people's time organized by the demand of the capitalist system.

The compression of time and space accelerated the economic changes but also the new technologies provide the decrease in labor time and this leads to increase in leisure time. This can be called surplus time appropriated by the capital by means of the new technological development. The interviewees exemplify the existence of capitalist appropriation of surplus time for leisure activities in this chapter. In this sense, the surplus of labor time has been shaped through the informational technology. This information technology changes the pattern of working. Webster argues that in the production sphere the worker as an element of being controlled operates the controls to controlling of the controls (1995: 271).

Even the worker labor has become educated and has been controlled by information technologies. The technological proletarization has arisen on account of the set of articulation with losing control of labor. Under these circumstances the engineers, doctors, artisans are becoming proletarian and they have no more control on their labor. Kumar argues that it does not bring a radical shift in the way industrial societies on the basis of the organization of labor. The capitalist industrialism intends to maximize the profit, power and control (1995: 154). The only difference with informational capitalism is the greater range and its intensity of capitalist industrialism's applications.

Moreover, the market and new technology drive a new form of flexible specialization. The flexible specialization is built upon the adaptability of productive organizations: the ability of workers to move from one job to another, the flexibility of legal constraints governing the contract of employment; the adaptability of wages and the possibility for companies to shrink the cost of social and fiscal payments. The flexible specialization has come out for the specialized goods as the demand of fragmented and volatile market (Heiskanen and Hearn, 2004: 86). The information technology contributes to the flexible specialization by means of time-space distanciation. Castells argues that the electronically managed global capital markets manipulate the time and the work

time is build upon the flexi-time to maximize its most effective use (Webster, 1995:108). The information technology provides the increase in capitalist accumulation needed for economic growth.

Harvey introduces us the concept 'accumulation by dispossession' and defines the neo-liberal changes after 1970's for western countries. The four implementations of neo-liberal policy are privatization, financialization, management and manipulation of crises, and state redistributions. In the global level, the structural adjustment programmes has been applied in underdeveloped countries which had experienced financial crises within the neo-liberal policies(2003: 137). The international financial institutions determines these programmes whose aim is to provide the liberalization of economy for rapid process of integration into world economy. (Storey, 2000: 301) The Turkey has included in the same process that the state has served to secure the social reproduction of a capitalist society and speed up the process of integration into global capitalism. The science and technology development is described as the dynamics of globalization that represent the new qualitative transformation of capitalism. The role of state maintains its importance for implementing the legal mechanism and guaranteeing the legal system in relation to the international law system (Soyak, 2008: 120). The periphery countries such as Turkey are subjected of trans-nationalization of production capital in the capitalist economy. Some of interviewees have emphasized the vicious circle of relationship between the core and periphery countries. That added to this relationship that the multinational companies can not have useful effect for triggering the development of technology in the local.

The goal of multinational companies is for the utilization of the resources that are cheap labor, in the vicinity of market, the flexibility of regulations of the country. On the other hand, some argument has carried out by the interviewee that the multinational countries have capable to bring new possibilities for the technology development in the periphery and local level. They exemplify this issue with the case of South Korea. Pamukçu (2001: 87) argues that the firms in developing countries try to import the capital commodity used in the international best practice. But there is no adequate human capital which has the ability to use the transferred technology in the developing countries. One of the interviewee argues that South Korea uses well-organized contract to prevent its system from the excessive intervention of multinational companies during the technology transferring process. Another interviewee argues that the multinational companies took the possession of the most of the South Korean Companies in this financial crisis. It can be assumed that the dependency relations have been expanded out of the borders by means of new technology. The multi-national companies lead to the new forms of dependent relations on the basis of production, consumption and the reproduction of the technology.

Some interviews criticize using of the concept ‘globalization’ that the globalization is a kind imperialism and conceal the unequal relations among the capitalist society. The state of dependence is continued by means of the exploitation relations in the capitalist system. Savran argues that this is the era of imperialism and globalization, in which multi-national companies are dominant. According to him, these companies work on behalf of interest of one-nation rather than existing for serving multinationally(2008: 43). This condition brings up the concealing of the unequal relations in the capitalist system. The technology provides to deepen the existing hierarchical relations. According to Marcuse, the machine is not neutral; it is guided by ruling and political interests. The social ruling of a given society is by means of the technical reason altered in its structure (Clarke, 2006: 23). The new hierarchical and domination relations are redefined in the capitalist system in regards to the technological development.

Moreover, this chapter also includes the discussion about the social movement and technology. The contradictions of capitalism reflect on the social movement and the technology represents the alternative way of resistance. The technology brings the possibility for organization of social movement easier. For instance the internet provides the capability to gather and organize people easily. Some interviewee argues that the internet is useful tool to accelerate the organization of people but the real base of social movements are not as unifying as the class movements in the past.

The virtual space is not adequate for the emerged centralized movement because of becoming out of touch. They depicted the new social movements decentralized such as feminists, ecologists, and identity politics of race, ethnicity and sexuality. The primary reason for the constitution of new social movements is the new processes of commodification bureaucratization and homogenization that create a growing politicization of social relations and the dissolutions of old solidarities and forms of community. These processes create new forms of resistance and antagonism expressed in the new social movements. (Laclau &Mouffe, 1985: 112) It can be evaluated that the new forms of resistance leads to the trivialization of the class movement and put the class struggle into the secondary position. The class struggle between the labor and capital has been examined on the basis of technology in the light of the interviews in this study. The interviews brings up with a dichotomy. The dichotomy is either the lasting of the contradiction of labor and capital or its ending totally. Some of the interviews argue that technology provides the increase in efficiency of production, cheapen the subsistence level and for this reason there is no more contradiction of capital and labor. Thus; this approach has emphasis on the death of subject to revolt against the system. For Foucault, subjectivity has no absolute, universal or consistent content but it come along a regular position in cultural position and social life. The emphasis of interviewee on the death of subjectivity has reminded commodification us Deleuze and Guattari’s radical argument that subjectivity itself does not exist. Deleuze and Guattari conceptualized the endless and multiplicities of interrelationship in the assemblages (Mansfield, 2000: 137).

On the other hand, the other interviewees evaluates that the contradiction between labor and capital continues and the technology deepens this growing contradiction. The capitalist system takes the advantage from technology on the basis of new forms of work and new division of labor. I think that the increase in the number of social movement can lead to devalorisation and decrease in the influence of resistance.

This chapter has also discussed the gender and technology by the help of interviews. The capitalist relations and patriarchal relations are examined for understanding the position of women in relation to technology. The women's employment position has changed and the new forms of labor have emerged as the consequences of information technology. The change manufacture into information sector does not transform the status of job chosen by woman

When woman perform the repetitive and standardized tasks in the advent of computer technology, the man enable to choose jobs to get greater economic advancement and social power. While the technology becomes varied in the workplace, the female labor has become more invisible by using new technology. Some interviews show us the international division of labor and multinational companies is polarizing the gender relations in accordance with the female labor force participation and new technology skills. Other argument is that the technology can play a beneficiary role to diminish the inequality of gender. The biological difference has been disappeared by means of new information technology. This perspective has similar characteristics with cyber-feminists. Cyber-feminists argue that cyberspace is considered to be the medium through which to look into the concepts of emancipation, empowerment within transcendence of physical subjugation (Haraway 1985: 83).

On the other hand the patriarchal relations are embedded into the cyberspace and the design of technology that manifests masculine characteristics. The reproduction technologies at home sphere leads to decrease the value of woman's labor as unpaid. I can assume that the technology, the patriarchal relations and capitalist relation are interrelated and it seems difficult to give hope for emancipation of woman through technology in the light of interviews.

In conclusion, the study of technology in the social sciences is enormously diverse and multifaceted. The main problem of study is whether the technology is dependency or autonomous. The relationship between the social science and technology, its dynamic characteristics; uncertain, risks, unforeseen and the global capitalism and social inequality have been examined in the light of interviews. The interviews include wide-range of perspectives and that is not simply to read. But the technology is socially dependent and reflects the hierarchical relations and unequal relations among society. However, there is no single theory and dominant perspective. It is not claimed that

this study contains all debates on technology in the literature. Actually, the interviews shape the borders of the study and the social theories are used for giving meaning to data of the research. This thesis can trigger new studies on this issue and contribute to the discussion of technology with respect to the critical approaches.

REFERENCES

Abbinnet R **(2003)** Culture and Identity Critical Theories London: Sage Publications.

Abramson B D **(1998)** Translating Nations: Actor-Network Theory in/and Canada, *The Canadian Review of Sociology and Antropology* 35: 1-18.

Ansal H **(1986)** Teknolojinin Taraflılığı ve Üretim İlişkileri *Onbirinci Tez Kitap Dizisi* 1: 154-172.

Axelos K **(1976)** Alienation, Praxis, and Techne in the Thought of Karl Marx Austin : University of Texas Press

Avar A **(2007)** Aydınlanmaya Karşı Aydınlanma, Akılcılığa Karşı Akılcılık: Frankfurt Okulu ve Epistemolojik Tarih Geleneğinde Tekno-Bilim Eleştirisi *Toplum ve Bilim* 110: 153-180.

Aygül **(2009)**
http://www.yayed.org.tr/resimler/ekler/7664060cc52bc6f_ek.pdf
[cited 27 March 2009]

Bell D, Loader D, Pleace N, Schuler D **(2004)** Cyber Culture New York: Routledge Taylor&Francis Group.

Bijker W, Hughes T, Pinch T, **(1987)** The Social Construction of Technological Systems: New Directions in Sociology and History of Technology Cambridge: MIT Press.

Bimber B **(1990)** Karl Marx and the Three Faces of Technological Determinism *Social Studies of Science* 20: 333-351

Brush L **(1999)** Revisioning Gender Gender, Work, Who Cares Production, Reproduction, Deindustrialization and Business as Usual, Chp.6 London: Sage Publication

Carlisler R **(2004)** The Inventions and Discoveries Scientific American New Jersey: John Wiley&Sons Inc. Hoboken

Castells M **(2000)** Toward A Sociology of the Network Society, *Contemporary Sociology* 29: 693-699.

Castells M **(2000)** Materials for An Exploratory Theory of the Network Society *The British Journal of Sociology* 51: 5-24.

Cooper S **(2006)** Technoculture and Critical Theory: In the Service of the Machine England: Routledge Press

Dahms H **(2008)** No Social Science without Critical Theory Current Perspectives in Social Theory UK: Emerald Group.

Delanthy G, Işın E **(2003)** Handbook of Historical Sociology London: Sage Publication.

Dusek V **(2006)** Philosophy of Techology: An Introduction, India: Blackwell Publishing. Nye D (2006) Technology and the Production of Difference American Quarterly 58: 597-618

Edgar A, Sedgwick P **(2003)** Cultural Theory: Key Concepts N.Y: Routledge.

Edwards T **(2007)** Cultural Theory London: Sage Publication.

Feenberg **(2008)**
http://www.sfu.ca/~andrewf/marcuse.htm
[cited 15 October 2008]

Feenberg **(2008)**
http://www-rohan.sdsu.edu/faculty/feenberg/PREF.HTM
[cited 26 December 2008]

Fine B, Saad-Filho A **(2004)** Marx's Capital USA: Pluto Press.

Flyvbjerg B, Sampson S **(2001)** Making Social Science Matter US: Cambridge University Press

Fountain **(2008)**
http://www.cours.fse.ulaval.ca/edc-65804/Actor%20Network%20Theory.pdf
[cited 09 November 2008]

Gane N **(2004)** The Future of Social Theory New York: Continuum Publishing.

Gerrie J **(2003)** Foucault and the Philosophy of Technology, Techne 7:2 Winter

Godzinski **(2008)**
http://www.humboldt.edu/~essays/godzinski.html
[cited 16 October 2008]

Gönel F **(2001)** Güney Kore - Türkiye Planlı Kalkınma Deneyimlerinin Karşılaştırılması: 7. National Social Sciences Congress, Ankara

Grampton J W **(2003)** The Political Mapping of Cyberspace Great Britain: The University of Chicago Press.

Güçlü A, Uzun E, Uzun S, Yolsal H **(2002)** Felsefe Sözlüğü Bilim ve Sanat Yayıncılık: Ankara.

Haraway **(2008)**
http://sfs.scnu.edu.cn/blogs/linghh/uploadfiles/2006928221222229.pdf
[cited 20 October 2008]

Harskamp A **(1996)** Conflicts in Social Science New York: Routledge Press.

Harvey D **(2003)** The New Imperialism New York: Oxford Press.

Hearn J, Heiskanen T **(2004)** Information Society and the Workplace: Spaces, Boundaries and Agency London: Routledge Press.

Heffernan N **(2000)** Capital, Class and Technology In Contemporary American Culture Projectig Post-Fordism USA: Pluto Press.

How A **(2003)** Critical Theory New York: Palgrave Macmillan Publication.

Jessop B **(2003)** Informational Capitalism and Empire: The PostMarxist Celebration of US Hegemony in a New World Order *Studies of Political Economy: A Socialist Review* 71/72: 39-58.

Kiper M (2004) Teknoloji Ankara: TMMOB Yayınları Kozan Ofset.

Klein H K, Kleinman D L **(2002)** The Social Construction of Technology: Structural Considerations *Science Technology Human Values* 27: 28-52.

Kumar K **(1995)** From Post-Industrail to Postmodern Society: New Theories of the Contemporary World Oxford: Blackwell Publication.

Laclau and Mouffe **(1985)** Hegemony and Socialist Strategy London: Verso Publisher.

Lash **(2009)**
http://translate.eipcp.net/transversal/0107/lash/en
[cited 26 March 2009]

Latour **(2008)**
http://www.bruno-latour.fr/livres/vii_tdm.html
[cited 05 November 2008]

Latour B **(1994)** Pragmatogonies A Mythical Account of How Humans and Nonhumans Swap Properties *American Behavioral Scientist* 37:791-808.

Loon J V **(2002)** Risk and Technological Culture towards Sociology of Virulence London: Routledge Press.

Mansfield N **(2000)** Subjectivity: Theories of the Self from Freud to Haraway Australia: Allen Unwin Press

May T, Powell J L **(1996)** Situating the Social Theory England: Open University Press.

Merrifield A **(2006)** Henri Lefebvre: A Critical Introduction New York: Routledge Taylor and Francis Group

Miles **(2009)**
http://globalmedia.emu.edu.tr/spring2008/book_reviews/4.%20Chris%20Miles%20book%20review.pdf
[cited 11 April 2009]

Mitter S, Rowbotham S **(1995)** Women Encounter Technology: Changing Pattern of Employment in the Third World London: Routledge Press

Moghadam V **(1999)** Revisioning Gender Gender and Global Economy, Chp.5 London: Sage Publication

Nalbantoğlu H **(2009)** Arayışlar: Bilim, Kültür, Üniversite İstanbul: İletişim Yayınları

Nye D **(2006)** Technology and the Production of Difference American Quarterly 58: 597-618.

Pamukçu T **(2001)** Teknoloji, Sanayileşme ve Türkiye: Quo Vadimus? *Mülkiye Dergisi* 25: 77-118

Parayil G **(2002)** Conceptualizing Technological Change Theoretical and Empirical Explorations, England: Rowman&Littlefield Publishers INC.

Peet R, Hartwick E **(2002)** Theories of Development USA: Gilford Press.

Pinch T, Bijker W **(1984)** Social Construction of Facts and Artefacts: or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other, *Social Studies of Science* 14: 399-441.

Ritzer G **(2005)** The Encyclopedia of Social Theory UK: Sage Publication.

Olsen O E, Engen A O **(2007)** Technological Change as a Trade-off between Social Construction and Technological Paradigms *Technology in Society* 29: 456-468.

Oppenheim R (**2007)** Actor-Network Theory and Anthropology After Science Technology and Society *Antropological Theory* 7: 471-493.

Özuğurlu M **(1998)** Üniversite-Sanayi İşbirliği Programı Üzerine Bir Eleştiri, *Kültür ve İletişim Dergisi* 2: 51-55.

Savran S **(2008)** Kod Adı Küreselleşme: 21.yy'da Emperyalizm İstanbul: Yordam Yayın.

Sergio S **(2004)** An Introduction to Science and Technology Studies UK: Blackwell Publishing.

Schneider J **(2005)** Donna Haraway: Live Theory New York: Continuum.

Simpson, L **(1995)** Technology Time and the Conversations of Modernity, USA: Routledge Press.

Somel C **(2001)** Kalkınmasız Teknolojik Gelişme Politikaları Mülkiye Dergisi 230: 67-76.

Stalder F **(1998)** The Network Paradigm: Social Formations in the Age of Information *The Information Society* 14:301-308.

Sterne J **(2003)** Bourdeiue, Technique and Technology *Cultural Studies* 17: 367-389.

Storey A **(2000)** The World Bank, Neo-liberalism and Power: Discourse Analysis and Implications for Campaigners *Development in Practice* 10: 361-370.

Sytze K, Kees B **(2002)** No Time to Spare? Time and Technology, *Time Society* 11: 351-355.

Taymaz E **(1993)** Teknoloji ve Kriz *Toplum ve Bilim* 56: 5-41

Philip B, Feenberg A **(2003)** Modernity and Technology USA: Massachusetts Institute of Technology.

Turner B **(2009)** The New Blackwell Companion to Social Theory USA: Blackwell Publication.

Wajcman J **(2006)** Techno-Capitalism Meets Techno-Feminism: Women and Technology in a Wireless World, *Labour and Industry* 16:7-20.

Wajcman J **(2002)** Adressing Technological Change: The Challenge to Social Theory *Current Sociology* 50: 347-363.

Wise J M **(1997)** Exploring Technology and Social Space Thousand Oaks, Calif: Sage Publications.

Woolgar S, Grint K **(1997)** The Machine at Work London: Polity Press.

Walby S **(1990)** Paid Employment Chp. 2 Theorizing Patriarchy, Basil, Blackwell Cambridge.

Wolin R, Abromeit J **(2005)** Heideggerian Marxism Herbert Marcuse US : University of Nebraska Press.

Wyer M, Barbercheck M, Giesman D, Öztürk Ö H, Wayne M **(2001)** Women Science and Technology New York: Routledge Press.