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**EFFECT OF INFORMATION TECHNOLOGY ON THE REPRODUCTION
OF THE DOMINANT CLASS**

A thesis submitted to
the Faculty of Graduate Studies
in partial fulfilment of
the requirements for the degree of

Master of Arts

Carleton University
Ottawa, Ontario
19 July 1999

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"EFFECT OF INFORMATION TECHNOLOGY ON THE REPRODUCTION
OF THE DOMINANT CLASS"

submitted by Zdenek Hanzlicek
in partial fulfilment for
the degree of Master of Arts

Thesis Supervisor

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July 19, 1999

Abstract

This thesis theorizes the reproduction of the dominant class using Habermas' theory of society and then analyses how information technology affects this reproduction. It argues that access to mechanisms of control of system is based on actors' knowledge of the system. System is viewed as consisting of various kinds of knowledge including cultural knowledge. Cultural knowledge of the dominant class reproduced in their exclusive lifeworld by providing an advantage for accessing the positions of control allows the reproduction of this class. By making possible increased codification of system information technology reduces need for cultural knowledge in the system. Without exclusive cultural knowledge the dominant class cannot reproduce itself and the society becomes more meritocratic.

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1. INTRODUCTION

1.1 Introduction - Relevance of Social Power and Class

All societies change but the rate of change we are presently experiencing is widely noted and often with concern. While there are likely more causes of this rapid change, and it would be impossible to untangle them all, proliferation of information technology (IT) is certainly one of the most important. IT affects society in a number of ways. It provides a new means of communication and so transforms the social relations and also people's perception of social reality. IT also revolutionizes the economy by automation of production, creation information products and by changing the organization of production as well as exchange.

These changes have been made possible by IT's capacity for generation, storage and distribution of information at volumes and speeds not possible for humans. Further, information processing can now be executed independently of human intervention, creating systems with dynamics increasingly independent of human agency. As IT stores or embodies a growing proportion of social knowledge, and allows laymen to effectively use this knowledge, it makes many professions redundant or deskills them. This is because IT encourages codification of what used to be intuitive knowledge reproduced through practical experience and passed on through culture (DeLanda, 1991).

These changes, while they do bring some unquestionable benefits, are also a reason for concern. From the perspective of the modern world view that holds that society can and should steer

the direction of its change, any change represents risk as well as opportunity. The modern view has been widely criticized in recent years but it has not been replaced by any viable alternative and it remains deeply ingrained in the consciousness of the society. The speed of the change makes the risks more serious because it causes the understanding of society to lag even further behind the emergent social reality. This increases the chance that irreversible undesirable developments are established before society is able to assess the changes and consider corrective actions.

In this situation it is particularly important that society identifies the risks and opportunities as early as possible. It is the role of the social sciences to develop tools that aid 'reading' and understanding of the changes. Such tools are social theories and theoretical concepts. They are necessary for empirical research, which then can indicate actual trends in the society. Identification of risks and opportunities also can mobilize society and promote its capacity for self-regulation.

While there are many theories that more or less adequately explain the past, change in society brings new challenges that require that the existing theories are adjusted or scrapped. In this way it also presents an opportunity to improve social theories by generalizing them to include new developments.

Progressive social sciences have always been preoccupied with the questions of power. They have strived to understand the sources and mechanisms of power, how different kinds of power affect the distribution of power and stratification of society,

and how this stratification can be ameliorated. There are good reasons for this concern with power. A concentration of power, in the long run, affects the stability of society. As it paralyses the self-regulating capacity of society, there remains no mechanism that could reverse the trend in some controlled way. A major social conflict seems to be then the only mechanism that can reverse the growing polarization. In this century this function was taken care of by the two world wars (though not caused directly by social stratification), the Great Depression and the Bolshevik revolution in Russia. Concentration of power also leaves a large part of society with limited control of their circumstances. The disempowered groups suffer from a diminished quality of life that is reflected in their physical and mental health. Further, their contribution to society ends up being far below their potential.

IT has already started changing society and more dramatic changes are expected. Changing all social activities, this technology will inevitably also have an impact on social power. As mentioned, IT has a direct effect on the character of communication and on the reproduction and distribution of knowledge. Knowledge has always been an important factor in the equations of power. Since any process of technical change unevenly benefits people at different locations in a structure of social inequality (Miles and Gershuny in Mansell and Silverstone, 1996:36), it can be expected that it will introduce new mechanism of concentration of power. Society has, over time, developed ways to equalize the distribution of power or to

compensate for the existing differences of power to ensure social stability. They included provisions like the regulation of labour relations, social services, welfare and legal recognition for trade unions. Many of these provisions were, however, seen as an obstacle to the transformation of the economy and fell victim to deregulations. It is important that new ways to deal with the imbalance of power are found. We have, however, little understanding how the new power would work and even less understanding of how we could control it. The understanding of mechanisms of power is necessary for development of policies aimed at power equalization.

With the recognized importance of IT, there has been a proliferation of literature addressing its effect on the society. Few authors, however, have paid much attention to the relation between IT and power in society. Those who do address the issues of power tend to focus only on the impact of IT on specific areas and aspects of society, and to assume existing relations and institutions in their analysis. There does not seem to be any work that attempts to assess the impact of IT on power in society considering that IT is changing and even replacing the existing institutions. This thesis aims to expand the understanding of these issues.

1.2 Research Question

For the reasons discussed above, my interest is in the distribution of power in society. There are differences in the natural talents of people which will always produce some

difference in their power but, if the society still recognizes the ideal of equality, it needs to make sure that there are limits to these differences. It is also important that, within these limits, the power of individuals is determined by their natural talent and contribution to society, rather than by advantages provided by their social background. The two objectives are connected; with increasing differences in power it becomes more and more difficult to achieve even just a semblance of the equality of opportunity. To achieve the two objectives, maintain limits to stratification and to minimize obstacles to social mobility, society needs to have the capacity to systematically regulate itself. For this we need to understand the mechanisms of power and how privileged groups are reproduced.

The emerging 'information society' seems to be bringing along changing mechanisms of social regulations which are connected to social power. It is my objective to throw some light on the challenges brought about by IT in respect to the stratification of power. This thesis explores how IT is likely to change the mechanism of power of the dominant¹ class and how this class is reproduced. In the industrial society it has been the ownership of the means of production that was seen as the mechanism of power and also reproduced the dominant class. This thesis seeks to indicate whether this base of power will remain in place, and if not, in what way it is likely to be changed. The issue is not that

¹ I use the term 'dominant class' rather than 'ruling class' because the latter implies that this class exercises direct control and so it underrates the role of the state.

power may be changing hands, but that the nature of exercising power, and, therefore, the means and the scope of social control is changing (Stehr, 1992:111).

1.3 Hypothesis

In capitalist society wealth is a good indication of power. Actors compete for profit and income, apart from other reasons, because money can be accumulated and stored. It can also be easily converted into other kinds of 'capital' (Bourdieu, 1991:14) including the means of production.

Since the introduction of IT, there have been some dramatic changes in the profits and wealth of corporations and in the income of professions and occupational groups. Some once wealthy and profitable industrial corporations struggle to survive and production workers, middle management and office workers are losing employment opportunities and income. At the same time there have been rising fortunes in the new high-tech field. In this field can be found most of the fast growing and most profitable companies. Programmers, engineers, system analysts and designers are in increasing demand and their salaries have climbed correspondingly. Many started their own business, either as self employed consultants earning incomes comparable to executives of corporations, or starting IT companies many of which are growing at speeds not seen since the Industrial Revolution.

These changing fortunes tend to be connected to the use of IT. Occupations that can be replaced by this technology have suffered losses. On the other hand those who can, with the help of

IT, replace workers in traditional jobs are benefiting. What the new, successful occupations and companies tend to have in common is that they process and analyze information. This suggests that there is a new source of power which is somehow connected to information and IT.

The hypothesis this thesis tries to support is that information is the new source of power. The power based in the control of information may be even competing with the power based in the control of money through the ownership of means of production. Those who have the capacity to control information could form a new dominant class.

1.4 Method and Theoretical Foundations

My method is essentially to theorize the mechanism of power of the existing dominant class power and the reproduction of this class. Then I analyze the implications of the changes brought about by IT for the theorized phenomena.

To be able to analyze the power and relations in society I need a suitable theory of society. This theory must allow me to theorise the power of the existing dominant class and also has to be able to incorporate the function of IT so that its effect on society can be analyzed. Habermas' (1987) theory of society appears to meet these requirements. This theory recognizes two kinds of relations in society constituting two autonomous spheres. One sphere, lifeworld, is constituted by actions oriented to mutual understanding and the other sphere, system, is constituted by actions oriented to goal achievement. Our existing system

consists of two main subsystems, economy and state administrations, which are regulated by the steering media of money and administrative power respectively.

In agreement with the generally accepted view, I see the system as the base of the dominant power in our society. The dominant class then can be defined by its capacity to control the system through the control of the media. There is another kind of power that can be conceptualized using the theory and that is the influence of the system and lifeworld imperatives. This influence is not amenable to direct control by actors. The imperatives are of interest because they can, under some circumstances, overrule the power of the media.

I believe that the functional imperatives have capacity to change the regulation of the system by introducing a new dominant medium and thus change the dominant class. I attempt to theorize information as a new steering medium. Information then could become a source of power for those who control it and IT could be seen as the means of control of this medium. A closer look makes it clear that the medium of information is not directly anchored in the lifeworld and so it can exercise power only through the two established media. This means that the medium of information cannot substantially affect the power of money.

Since the first method fails to provide a desired insight into the effect of IT, I will then try a different method, one is based on the argument that it is individuals' knowledge of the system that determines who moves into the positions that control the steering media. Since IT is transforming the system it is

likely to change what kind of knowledge is required. Different knowledge is likely to be acquired by individuals in a different way. This would change the dominant class reproduction and the character of the class. The system in the industrial society has consisted of various institutions. In the emerging information society many institutions are being replaced by IT. By analyzing the difference between acquiring the knowledge of institutions and knowledge of IT, I expect to gain indication how the dominant class is likely to change.

2. SYSTEM INFORMATION AS A STEERING MEDIUM

This chapter starts with a brief outline of Habermas' theory of society. Using this theory it then elaborates two mechanisms regulating society organized as a system, influence of the steering media and functional imperatives, both of which can be sources of power of actors. The dominant class is defined by the capacity to control the dominant medium. Then I elaborate how the influence of the established media are secured and how a new medium could be established. Finally, I theorize information as a steering medium and show that such a medium cannot threaten money as the dominant medium.

2.1 System and Lifeworld Theory

Habermas' (1987) theory of society builds on earlier theories of social systems, particularly on Parsons. These theories viewed modern society as a system organized with the objective of material production and with all relations and actions subordinated to this objective. The weakness of the system theories is that they fail to consider the needs of reproduction of culture and formation of personality. Habermas used Mead's concept of lifeworld to complement Parsons' theory. I present below a brief outline of Habermas' theory.

Habermas sees the relations in society separated into two autonomous spheres, lifeworld and system. In lifeworld the coordination of actions is achieved through consensus which depends on the mutual understanding of actors. This means that to initiate an action the society needs to understand the meaning of

the action. All actions are subject to the scrutiny of the society and the actions of individuals are regulated by normative control. This kind of action coordination, in addition to achieving the goals, also provides the conditions necessary for the cultural reproduction of the society and for the formation of personalities of its individual members. The pre-modern societies can be understood as organized purely on the basis of lifeworld.

Action coordination through consensus has its drawbacks. It provides little individual freedom and gives little opportunity to individuals to develop their creative potential. As a result it has limited capacity for developing knowledge and leaves society very vulnerable to the forces of nature. Action coordination on the principle of system provides improvement in this respect.

The differentiation of the system from lifeworld was made possible by the rationalization and differentiation of the lifeworld associated with the division of labour. The differentiated lifeworld lost the capacity for society-wide coordination of actions (Habermas, 1987:173) and so a new mechanism of action coordination was required. System regulated by steering media provided such mechanism. Rather than subjecting individual actions to normative control, the system provides actors with an increased degree of freedom while ensuring the integration of the results of their actions. Actors are free to take actions at their discretion with consideration of the influence of the media. The media thus uncouple action coordination from consensus formation.

The main steering media in Habermas' theory are money and

administrative power². Each medium structures its own subsystem constituted by institutional framework (Habermas,1987:174). The subsystems are the source of functional imperatives which provide them with a degree of autonomy from each other as well as from the lifeworld. Money facilitates a spontaneous action coordination in the subsystem of economy through the institution of market. The medium of power rationally organizes the administrative subsystem through the institution of bureaucratic organization. Apart from these institutions, which are necessary for the function of the media, there are additional institutions that make possible further increase in the complexity of the system.

From the lifeworld perspective, the system does not have any meaning of its own. It has to maintain its legitimacy by providing a material base for the lifeworld. The influence of the steering media is conditional on their legitimacy which is based on their demonstrated capacity to organize the system. The media also need to be anchored in the lifeworld to influence actions of individuals. Apart from providing a material base, the system has to respect other lifeworld imperatives which are determined by the requirement of the lifeworld reproduction.

2.2 Mechanisms of Regulation in System

While Habermas (1987) explicitly discusses only one mechanism of system regulation, the regulation by the steering media, it

² Habermas (1987:365) also uses the concept of steering medium for positive law, but this medium is not as important in his theory as the media of money and power.

cannot be the only mechanism because it does not explain all actions and relations in the system. It obviously cannot not explain the range of influence of each medium and restrictions on their influence. Neither does regulation by steering media provide for the possibility of a new medium being instituted or the dominant medium replaced by another medium. The concept of functional system imperatives helps to address these questions, it represents another mechanism of system regulation.

When some actors succeed in gaining control of either mechanisms of influence, they gain power to control the society. The power exercised through the steering media is controlled by actors directly. The imperatives, on the other hand, are generated by the logic of the subsystems which makes them to a large degree independent of agency. They can be influenced only indirectly by actors. I will show that there is a connection between these two mechanisms of regulation which secures the influence of the existing media and stabilizes the class relations in the system.

2.2.1 Power Based in the Control of Steering Media

As I have discussed, the system is regulated by the steering media in such a way so as to achieve integration of the results of actors' actions. Since both money and administrative power are controlled directly by actors, they constitute a mechanism of social power. There are some differences between the two steering media, in the way in which they are controlled and how they replace consensus formation. There are also different restrictions on their use.

The control of money is facilitated by the institution of ownership, the owners ultimately have the right to decide how their money is spent or invested. The ownership of money, however, generates little power by itself because money sitting idle has little influence. What is important for the function of money as a steering medium is its movement. It is the flows of money that exercise influence, induce individuals to act and develop the economic subsystem. The capacity to direct these flows is then a source of power and this capacity is relatively independent of ownership.

In the early stages of capitalism the owners mostly decided directly how their money was to be used. The owner still decides in the case of money used for personal consumption. In the case of investment and rational development of the economy, however, the link between ownership and control is increasingly indirect. In the developed capitalist economy most of the control of money is delegated and the large flows of money are controlled by institutions with large throughput of money. This is where corporations draw their power. They invest in capital goods, buy raw materials, components and services and also pay wages to labour. Banks are another institution controlling large flows of money. They control the development of the economy through controlling investments. The general population in aggregate also controls large flows of money. They do not have, however, any unifying interests, pay little attention to the consequences their actions have on the system and do not try to control the economic relations.

To exercise power over the actions of individuals the media need to be anchored in the lifeworld. Habermas (1987:270) says that money is anchored in lifeworld by law, particularly by the law of property and contract. No law can be effective, however, if the society does not see it as legitimate and does not respect it. This respect for the influence of money is contingent on the demonstrated capacity of money to organize the system. The influence is also dependent on the socialization of individuals to market relations in the culture that accords money an apparently inherent value.

Parsons (in Habermas, 1987:264) used money as the model for the concept of steering medium. Money is seen as an ideal medium because it completely replaces consensus formation and does not seem to provide structural advantage to any group. Money and market also seem to afford a complete freedom of action and regulate only by assigning 'rewards' and 'costs' to actions. The perceived neutral character of money is the reason why there are few restrictions on the use of money. It is accepted and expected that individuals use money for their self-interest. Because money is supposed to facilitate a non-rational self-organization of system with complexity beyond the understanding of the actors nobody is seen as responsible for the results.

In reality, regulation by money produces concentration of power which, if unchecked, causes system malfunctions. Since such malfunction would lead to the loss of legitimacy of the system, the members of the dominant class do consider the consequence of their actions. They take actions that may be against their short-

term interests to regulate markets and also support some regulation of the economy by the state³.

Before discussing the medium of power I need to address the relation between the two concepts of power I use. One concept is the medium of power which legitimately regulates the administrative subsystem and the other is power as the capacity to organize system relations. The medium of power really is a special case of the capacity to organize the system. The power to organize the system also includes the power exercised through the control of other steering media, like the control of money which is discussed above.

The medium of power is instituted by a legally sanctioned authority of office which anchors the medium of power in the lifeworld (Habermas;1987:270). Again, this would not be sufficient by itself. Like in the case of money the influence is contingent on the legitimacy of the medium based on its demonstrated capacity to organize system. Another condition for effective function of the medium of power is that there is some means of enforcement of the decisions of the officials. This is achieved by backing up the power with the threat of coercion.

³ The term regulation is used here in two different meanings: in one meaning steering media regulate subsystems by influencing actions in some way that is not closer specified; in the other meaning the medium of power is also used for the regulation of economy but only in the sense that it can restrict the range of actions, set rules, promote or discourage some actions etc. but it cannot control individual actions on an ad hoc basis, without following some rules.

The office holders, i.e. senior managers in the public administration, however, are not able to apply their decisions to the society directly. They have neither the capacity to communicate their decisions directly to each individual and monitor compliance, nor do they have the understanding of the specific circumstances to interpret the abstract decisions for the various local contexts. The medium of power has to be exercised through the institution of bureaucratic organization. Organizations provide senior officials with a representation of the social reality, provide mechanism for applying their decisions and monitoring the compliance. They also facilitate observation of the effect of the applied control. To be able to perform these functions organizations store knowledge required for interpretation between different contexts.

The medium of power falls short of an ideal medium in a number of ways. The problem with power is that, unlike money, it organizes system rationally, according to an accepted model. Such rational organization is dependent on the concentration of power which allows the administration to impose its understanding of issues on the rest of society and so replace or simplify the process of consensus formation.

The concentration of power requires tighter restrictions on the use of this medium. Administrators cannot use the medium of power directly for their personal benefit. To maintain legitimacy they have to appear to act in agreement with the functional imperatives of the system or with the imperatives of the lifeworld. The performance of the system may not be enough to

demonstrate that they act according to the system imperatives and not out of personal interest. Unlike in the case of the control of money, even individual actions may be challenged. The monopoly of knowledge exercised by the administration helps in limiting such challenges.

2.2.2 Power of Functional Imperatives

Imperatives are another mechanism regulating system relations. Habermas (1987) notes two kinds of imperatives, functional imperatives of system and lifeworld imperatives, but he does not provide any explicit definition. I will focus on the functional imperatives which are, because of my assumption of system driven change, more important for my analysis. I see functional imperatives as the actions and conditions required for the optimal functioning of the system. They can be defined either objectively or subjectively. Not even the objective imperatives are absolute, however. In a specific situation there may be some obvious objective imperatives but it is not possible to assemble a comprehensive set of objective functional imperatives.

There are number of reasons why a comprehensive set of objective imperatives cannot be determined. To start with there is no explicit ultimate objective of the system function. Such objective would require a teleologically defined development of society. Another reason is that there are different, incomparable, and also incompatible, options as to how the system can be developed. All decisions or actions change the system and thus the imperatives as well, and it is not possible to predict reliably

the consequences of these changes because of the complexity of the system relations. Finally, functional imperatives also depend on the time scale considered for optimization. Actions that improve the system performance in the short term are often detrimental in the long term.

To be able to use the concept of functional imperatives in my analysis, I need to find out how they are determined. While there are no explicit objectives of the system's function, there are some functions of the system for the lifeworld that seem to be implicitly considered. (The system imperatives are ultimately connected to the lifeworld imperatives discussed below.) There seem to be two such ultimate functions. One is to provide the material base for the lifeworld. In modern society it seems that the imperative is that the system supports ever increasing consumption. The other ultimate function seems to be to maximize the competitiveness of the society to ensure its independence in the respect to other systems, i.e. nation states.

The objective functional imperatives are further determined by the character and state of the existing system. This includes the existing technology, both the physical technology (machinery, infrastructure etc.) and the technological knowledge. Another part of system is the knowledge constituting the existing system organizations. Both these kinds of knowledge can be seen as an 'objective' knowledge, i.e. an objective part of the system. In the case of the objective knowledge residing in human minds, it is the knowledge that is connected to people's function as a part of the system. The connection of the functional imperatives to the

existing system means that the imperatives are not absolute but rather are historically determined.

The subjective imperatives are connected to the objective imperatives. They can be seen as a generally accepted understanding on the part of the society as to what constitutes the objective imperatives. They are determined by the society's understanding of the system, of its function and state, and also by the prevailing views on how the function could be improved through existing technological and organizational knowledge. This means that the subjective imperatives depend on a subjective knowledge of individuals looking on the system from outside.

The subjective imperatives are not a product of a systematic rational analysis but rather some vague opinion. Apart from the objective imperatives, they are shaped by scientific knowledge, mass media, education and personal experience. Since the understanding of the public is often flawed, it may produce subjective imperatives that are in conflict with the objective imperatives. When such 'false' imperatives are followed, the performance of the system deteriorates over time. This deterioration forces re-examination of the understanding of the system function and modification of the subjective imperatives. Subjective imperatives are important in the regulation of society because they influence the behaviour of individuals in a non-coercive way which is necessary to ensure the cooperation of individuals and thus for the optimal functioning of the system. Subjective imperatives then exercise influence through the formal political process.

Lifeworld imperatives also exercise some influence on the system. As noted the functional imperatives need to be connected to the lifeworld imperatives. To maintain legitimacy system has to consider lifeworld needs. There may be a more substantial difference between subjective and objective imperatives in lifeworld. The objective lifeworld imperatives concern 'only' the reproduction of lifeworld, i.e. of culture and personality. Subjective lifeworld imperatives are strongly shaped by the culture and include also the requirement of 'quality of life'. To what extent is the perception of quality of life determined by the objective lifeworld imperatives is an open question.

2.2.4 Organization of Economy by Money and 'Private Power'

The focus of my analysis is on the economic subsystem because this subsystem is the basis of the dominant power in the capitalist system. The dominant position of economy is generally recognized and is due to the dependency of the state administration on the economy for its material base (Habermas, 1987:171) together with restrictions on the legitimate intervention by the administration in the economy. The autonomy of the economy from the state can be seen as a legally articulated functional imperative. Centrally controlled economies have not performed as well, at least not over an extended period of time.

Habermas (1987:171) says that the economic subsystem is constituted by relations regulated by the medium of money. It is not organized by money alone, however. Industrial economy is also organized by a variant of the steering medium of power, by what

might be called the medium of 'private power'. This power regulates the relations within private corporations, while money regulates the relations between corporations and other economic actors. My reason for discussing private power is that it may provide me with an indication of how a new steering medium can be instituted.

Private power is similar to the medium of 'public' power associated with state administration. The basic mechanism of the function of this medium is the same; it is exercised through bureaucratic organization and regulates relation rationally by decisions and rules. On the other hand, private power differs from the power of public office in some ways. The holders of this power are accountable only to the shareholders. The criteria of performance that the holders of this power are judged against are more narrowly defined and are, in practice, limited only to corporate profits⁴. The effective range of this power is determined economically by the boundary of the corporation. Finally, this power is not backed by threat of coercion but rather by economic sanctions like the size of remuneration or the threat of termination of employment.

That the economic subsystem is regulated both by money and private power has relevance for the access to the control of money. There is an another kind of positive sanction backing private power, that of promotion. Access to the control of money can be gained not only directly by accumulating wealth and

⁴ The maximization of profits may involve other considerations such as the interests of the employees and public opinion.

acquiring ownership of means of production, but also through a career climb up a corporate hierarchy.

2.3 Definition of the Dominant Class by Power

For my analysis I need to define the concept of dominant class. Social class is a large group of individuals in similar positions which as a result have common interest, culture and consciousness (Bourdieu,1991:231). The characteristics that differentiate classes may include culture, education or economic wealth. The main reason why the concept of class is of interest is that classes are not only different but they form a hierarchy. There is an 'upper' class and a 'lower' class where the adjective is applied on the basis of the class' social status⁵.

Regardless of the characteristics differentiating classes a differential in the power between them is necessary for maintaining a stable class division of society. Since the lower class as a group strives to narrow the gap separating it from the upper class and individual members of the lower class struggle to move into the upper class, the latter needs to have the power required to frustrate these efforts. This means that the dominant class can be seen as determined by its superior power.

There are different kinds of social power and not all of them produce stratification of society into classes. In society organized as a system there are two conditions class-determining power has to meet to produce a stable dominant class. First, the

⁵ There may be more than two classes and some of these may have a similar status.

power has to be seen as legitimate, as necessary for the functioning of the system. Second, the mechanism of the power establishing the dominant class has to have built in a positive feedback, i.e. how much of the power an individual has must depend on the class membership and not just on the personal characteristics of the individual. This stabilizes the class membership and allows the development of common interests, culture and class consciousness.

In society organized as a system, the power of individuals is determined by their function in the system. The capacity to organize the system relations is a kind of power that defines the dominant class. Of the two mechanisms regulating system relations, only steering media can be directly controlled by actors. The dominant class may be seen as determined by the control of the dominant medium, i.e. money in the existing system. This definition is similar to Marxist definition of dominant class by the ownership of the means of production because means of production can be seen as the instrument of control of money.

It is not necessary that members of the dominant class use their power directly for their personal benefit. It is the recognition of the importance of their function for the society that gives them status and brings them benefits legitimately. As Habermas (1987:168) says 'the distribution of social power determines the recognized opportunities for need satisfactions and shapes the distribution of rewards'. Another benefit of this power is that it allows individuals to control their environment and circumstances. The members of the subordinate classes, even if

they are not suffering materially, do not have as much control.

2.4 Introduction of a New Medium

The two discussed mechanisms of power, the influence of the steering media and the functional imperatives, are connected. They form a positive feedback loop that secures the influence of the media. I have noted that the functional imperatives depend on the existing system, its state and the nature of relations. Since the system is structured by the function of the media, the dominant class can indirectly influence the functional imperatives by shaping the system. While they cannot ignore the functional imperatives in their decisions, they can select preferred solutions. It is in their interest to expand and promote the influence of the medium that is the source of their power whether by colonizing the lifeworld or by constructing new system relations. As the system function improves, it becomes more difficult to replace the medium because this would require a major effort to construct a new subsystem with a comparable performance. It is also a question whether this new subsystem would have the potential to provide comparable performance. This means that improved subsystem performance secures the position of the steering media.

The differentiation of the subsystem also increases its complexity. The more complex the system is the more difficult it is for the general public to challenge the imperatives as specified by the dominant class. This increases the discretion of the dominant class to specify the system imperatives.

There are other ways in which the functional imperatives may be shaped by the dominant class. Through the distribution of resources, the dominant class controls the development of new scientific knowledge and also the diffusion of the existing knowledge by their influence over the mass media. It is in their interest that the knowledge produced and diffused supports their role in the system.

The above discussion indicates that the dominant class has enough control to decide whether a new medium is introduced. Like any established power they tend to resist change because change represents a risk. To support my hypothesis that information could act as a new steering medium which could potentially push money out of its dominant position, I need to show how a new medium can be introduced and how the dominant medium can be replaced. The dominant class consists of fractions which compete for power. The competition stimulates innovation which may involve introduction of a new medium. For such a medium to be acceptable to the dominant class, it not only needs to improve the function of the system, it has to do so by supporting the influence of the existing dominant medium. Once established the new medium can start developing its own subsystem. The logic of this subsystem then generates functional imperatives that give the subsystem autonomy. An example of the introduction of a new medium is the insertion of the medium of private power that organizes internal relations of corporations into the economic subsystem. Whether the new medium can replace the existing dominant medium is determined by the functional imperatives. That the medium of private power

has not been able to replace money as the dominant medium controlling economy can be explained by the imperative of economic competition. This imperative is legally articulated in anti-monopoly laws and regulations.

Since my hypothesis holds that the change of the dominant class would be caused by introduction of a new steering medium, I am focusing here on the mechanism that secures the influence of the media and not on how individuals' control of the medium is secured.

2.5 Formation of Information Subsystem

To be able to analyze the influence of IT on the power in society using Habermas' theory of society, I will try to theorize information as a new steering medium. A success of this project would indicate that information could develop an autonomous subsystem which would provide a base of power for a new 'information class'. IT is seen in this hypothesis as the tool for controlling the medium of information and the source of functional imperatives that would provide the new medium with autonomy in respect to the existing media.

Before the introduction of IT, a large part of the system transactions took place through personal interactions which provided a comprehensive context and so there was relatively little information needed for execution of transactions. The parties usually had a continuous relationship and an established practice of negotiation. The preceding interactions could provide one kind of context. The type of setting where the transaction

took place could provide another kind of context. The information that was required was controlled by the media of money and power. It was exchanged as a part of the transaction and was not diffused further independently of the media. The diffusion of information was also prevented by incompatible codification schemes and discontinuity of communication infrastructures. Access to the information was further intentionally restricted, mostly by means of bureaucratic control. There was little reason for transaction participants to diffuse the information because such diffusion would offer no benefit and likely harm their interests. These restrictions on the diffusion of information were seen as acceptable because they were required for the function of the system, particularly the function of bureaucratic organizations.

IT changes the situation by facilitating the execution of transactions independently of personal interaction. It is also much more common that the parties in transactions do not know each other and so cannot draw on any established norms and there is no historically developed context. They do not know each others objectives and expectations. Without a context provided by personal interaction the knowledge required for the execution of a transaction has to be obtained through information. This means that all required knowledge needs to be codified in a standard way so that it can be distributed in the form of information. In market transactions, information is required to describe the goods, provide the identity of the parties, describe the conditions of exchange, etc..

As information, this knowledge can be diffused with little

effort. On the other hand, it requires effort to restrict access to this information to the participants in the transaction. Transactions executed by means of information and IT also generate information as by-product because all actions are in the form of information (Samarajiva 1996:138). At least some of this information is inevitably available also to the party providing the supporting infrastructure and substructure⁶. Such information has a high utility and its distribution improves system coordination and thus it is a functional imperative to diffuse it. It can also be further processed and analyzed to increase its utility and value. Information that has economic value can be sold and such commodified information is independent of the media in the sense that it is not accessible only to those participating in the transaction but it can also be distributed through the mechanism of market exchange.

In this way IT creates conditions for the creation of the medium of system information which is independent of money and power. This medium is processed and diffused, and so can be controlled, through IT. It can be controlled by developing the infrastructure and substructure and through control of the codification schemes. The actual and possible ways of the control would need to be researched in more detail. I do not pursue this route further for the reasons discussed in the next section.

⁶ Mansell (1996:111) uses the term substructure for various software programs required for trading over IT networks.

2.6 Condition for Information to Act as a Medium and Develop a Subsystem

The hypothesis that information can serve as another steering medium needs to be further supported. There are some conditions that an emerging steering medium has to meet to be able to gain influence and autonomy. I need to assess the 'medium of information' against these conditions to support the validity of the proposed method. Parsons (in Habermas, 1987:265) lists a number of conditions for a steering medium. They are derived from the function of money, apparently with an assumption that any steering medium has to have the same characteristics as money. It is not clear why Parsons believed that a medium has to meet all these conditions, but some of the media he proposed (value commitment and influence) clearly fail the test as Habermas (1987:275) shows. Even the medium of power that Habermas adopted in his theory is found marginal in his assessment and that only by stretching the interpretations of some of the conditions. Positive law, conceptualized as a steering medium by Habermas (1987:365) would also fail the test.

Habermas' use of the media of power and law indicates that media do not have to meet Parsons' conditions to be effectively used for analysis. Instead of using Parsons' conditions I will devise conditions that I believe a new steering medium needs to meet⁷. One condition is that new medium has to have the capacity to

⁷ The conditions that I have devised may not be sufficient. Considering that the medium of money fails these conditions, however, I do not need to make sure that I consider all necessary conditions.

improve the functioning of the system so that it becomes an imperative to use it for organizing the system. There is little doubt that the use of IT for information processing has a potential to improve the system function. Castells (1995:18) describes how IT has solved the problem of the stalled economic growth in the capitalist system. Taylor and Van Every (1993:162) note that IT can augment the capacity of individuals and allows them to replace whole departments. These examples illustrate the capacity of IT for the functioning of the system.

Another condition is that a new steering medium operates under a different logic than the existing media so that it cannot be directly controlled by them. Information is not amenable to effective control either by money and market or by power and bureaucratic organizations. Since information can be reproduced at no cost, and so is not scarce in the sense that material goods are, the market has a problem determining the value of information. Some methods, like the concept of intellectual property, have been devised to distribute some information through the market. The information medium, however, is necessary for the organization of the market itself and so it has to be outside market control so that the market can actually function. In the case of the medium of power, any attempt to control information by power reduces information's mobility and so defeats the purpose of IT. The management school of Office Automation attempted to control information by power but in the end, such use of IT failed to improve productivity (Taylor and Van Every, 1993:73).

The last condition is that a steering medium is anchored in

the lifeworld (Habermas, 1987:173). This is necessary so that the media can influence the actions of individuals. It seems that media can be anchored in lifeworld either directly or through another medium. Anchoring through another medium makes the influence of the new medium dependent on the existing one. The medium of private power is an example of such a medium as it is dependent on the medium of money for the anchoring and influence. The medium of information can influence actions only by shaping the understanding of the actors with respects to the possible economic gains or suitable positioning with respect to the medium of power. This indicates that the medium of information does not exercise an independent influence.

The results of the assessment are mixed. The medium of information seems to have some influence and degree of autonomy from the existing steering media. It has to rely, however, on the media of money or power for sanctions because it is not directly anchored in the lifeworld. This means that the medium of information cannot threaten the influence of money. Since the analysis indicates that IT will not have any effect on the position of money as the dominant steering medium, it does not support my hypothesis that the dominant class would change.

There is another possibility as to how IT could affect the dominant class, however, and that is by changing who controls money. The above analysis does not give any indication how likely this is. I need to use a different method to address this question.

1. REPRODUCTION OF DOMINANT CLASS THROUGH CULTURAL KNOWLEDGE

This chapter analyses how the control of the medium of money is affected by IT. I argue that who controls money is determined on the basis of the knowledge of the system. As IT changes the system, it also changes what knowledge is required for the control of money. I distinguish two kinds of knowledge, intuitive and codified and show how the system is constituted by the combination of these two kinds of knowledge. Cultural knowledge defined as intuitive knowledge reproduced by a group, ensures consistency and continuity of knowledge in functionally determined groups in the system. The dominant class, as one such group, produces cultural knowledge required for the control of money. This knowledge is passed across generations and so facilitates the reproduction of the dominant class.

3.1 Access to Control of the Media through the Knowledge of the System

Considering that money will likely retain its position as the dominant medium, there is still one possible way in which the dominant class could change. What seems to determine who is able to move into the positions of control of money depends on the mechanism of the control. This means that the change of the dominant class could be caused by change of the mechanism through which the medium of money is controlled⁶. This would affect not

⁶ As I have noted, it is the characteristics of the group that is of interest rather than the membership of the dominant class. Particularly, the question is to what extent is the class open to outsiders.

only the membership in the class but also its character. IT provides a new means of communication and so it can be expected to change the system and also the way in which the medium of money is controlled.

To find out what is the connection between the mechanism of the control and how the group that exercises the control is determined, I look at the existing system. As I have noted, in developed capitalism, most of the money flows are controlled by large economic institutions, particularly large corporations and banks. These institutions are bureaucracies internally regulated by the medium of private power. In this kind of relations it is promotion and career climb through the organizational hierarchy that provide the route to the positions of control of money. One important factor in deciding promotion is individual's knowledge of the system⁹. The importance of the knowledge of the system increases with the level of position and the size of controlled capital.

Based on the above, it is my contention that the control of money is determined on the basis of the knowledge of the system. Those who have the best knowledge of the system are likely to be placed in the positions of control¹⁰. That knowledge of the system

⁹I am not suggesting that knowledge of the system is the only factor determining who controls the media. What I mean is that it does have enough influence to reproduce the dominant class. There are other factors like industriousness, desirable attitude, social skills etc..

¹⁰ As I will discuss in more detail later, I do not understand knowledge of the system just as knowledge of formal institutions and regulations but

plays a role in the existing system does not mean that it has to be important in any system. Further support for this argument can be based on functional imperatives. If we believe in the rationality and agency of the society, it is an obvious objective imperative that the media be controlled by those who know the system best because they can achieve optimum system performance. They know and can accommodate the functional imperatives and make any new system relations compatible with existing structures. The dominant class has good reasons to strive to improve the performance of the system. The system is the source of their power and the legitimacy of this power depends on the system's performance. This performance also determines the position of the system in relation to the other systems, i.e. other states, and thus the autonomy of the dominant class.

The dominant class also needs superior knowledge of the system to prevent challenges to their power. Within corporate bureaucracies, control exercised by senior management is based on the control of knowledge (Weber in Stehr and Ericson:120,134). This knowledge gives them the capacity to define the functional imperatives. If other groups had better knowledge of the system, they could challenge the functional imperatives defined by the dominant class through the formal political process. That the dominant class has to act in agreement with the functional imperatives also means they have to ensure that the criteria for

also as knowledge of the interests of the dominant class, cultural knowledge, etc.

entry into the class, i.e. access to the positions of control, includes knowledge of the system. This seems to be one reason why nepotism is no more acceptable in private corporations than in the state administration.

Everybody has some knowledge of the system. Large part of society participate in the system function and are part of system relations through their employment. They have some experience with the system and know what to expect and how to act in their position within the system. Different kinds of the knowledge of the system do not have the same relevance for access to the control of the media. The question is what kind of knowledge is needed for the control of the media. Both for influencing actions and determining the functional imperatives, senior managers need the knowledge of interconnection of the actions in the system¹¹. Another factor determining the imperatives is an up-to-date state of the system. It also helps to discern trends in the system and anticipate actions of other actors. To have up to date knowledge actors have to know where to find the knowledge and be able to access it. Control of the media also requires that the individuals know how to interact with the system, that they are able to execute the required transactions. Some transactions are executed through formal procedures, while others are less formal and require that the parties share culture.

¹¹ As I will discuss in more detail later, the interconnection of actions in the system is determined, apart from the system structures, by other factors like the culture and the interests of members of the dominant class.

To determine the effect of IT on the dominant class I have to find out first what knowledge is required in the industrial system and how individuals can acquire this knowledge. This will allow me to explore in what way is IT likely to change the system.

3.2 Knowledge, Codification of Knowledge, Information

The concept of knowledge plays an important role in my analysis. I need to define knowledge and also provide classifications of knowledge for my discussion. I am concerned with knowledge as it directs actions. Boisot (1995:22), referring to Popper, defines knowledge as a 'propensity to act on the basis of a belief'. This definition includes not only explicit knowledge, i.e. knowledge that its holder could readily recall and critically examine, but also various kinds of implicit knowledge that are not amenable to rational analysis. What this definition excludes is all forms of externalized knowledge, whether it is recorded knowledge in the form of a text or physical technology. I need to include externalized knowledge (though not necessarily physical technology) in the concept of knowledge because it is critical for analyzing the effect of IT. IT does not hold any beliefs but it still can turn externalized knowledge into action.

I need to classify knowledge in two ways for my analysis. The first classification applies regardless of the form of knowledge and it identifies three kinds of knowledge. The first is descriptive knowledge which describes some reality, and makes it possible to recognize and classify parts of reality. The second kind is normative knowledge which direct actions in specific,

recognized circumstances. It is the basis of institutionalized norms as well as of positive law. Finally, there is instrumental, or procedural, knowledge which indicates how to achieve goals, execute operations etc..

The second classification is important for analyzing the possible ways of the storage and diffusion of knowledge and also for the ways in which knowledge can direct actions. This classification will help me analyze the difference between IT and institutions with respect to control of knowledge. Rather than classifying knowledge by how it is held, in mind or externalized, I will follow Boisot (1995:145) and distinguish between codified and uncoded knowledge. Codified knowledge is knowledge that can be recorded in writing or in some memory device but it can also be 'stored' in the human mind¹². Uncoded knowledge on the other hand is knowledge that cannot be recorded in any way and so can be held only in the human mind. I will now discuss these two kinds of knowledge in more detail.

3.2.1 Intuitive and Cultural Knowledge

Different kinds of uncoded knowledge include intuitive knowledge, tacit knowledge and implicit knowledge. What exactly is the nature of these kinds of knowledge and what are the differences between them is outside the scope of this paper. For

¹² Codified knowledge held in the human mind is in some ways different from recorded knowledge, however. It is always connected to some uncoded knowledge and it is not quite fixed. That means that it may produce different actions with time and changing context.

my discussion I will use the term intuitive knowledge and define it just as the state of mind which guides individuals' actions but cannot be analysed or easily communicated¹³. It does not include any well-formed concepts or theories only percepts and beliefs. As I will discuss later, there is no clear dividing line separating codified and intuitive knowledge. Intuitive knowledge may indicate causalities but the beliefs cannot be rationally supported. Since all methods of acquiring intuitive knowledge involve some personal factors and there is no way to objectively compare the intuitive knowledge of two people, this knowledge is personal. Each person's intuitive knowledge has idiosyncratic connection to the reality from which it was developed. Another characteristic of intuitive knowledge is that it cannot be fixed in time. It is subject to forgetting and deteriorates over time if not used. It can only be preserved by use but it is changed in the process. Intuitive knowledge also cannot be recalled at will; it is evoked by context, by specific situation or by some 'artificial' means like codified recorded knowledge or physical technology.

Apart from intuitive knowledge held by an individual there is also intuitive knowledge held by a group. This is really cultural knowledge. Cultural knowledge cannot be developed or reproduced by an individual, it has to be held by a group. By creating a context the group facilitates recall of intuitive knowledge of individual members. The group reproduces cultural knowledge as community formed around a shared practice. This community 'provides context

¹³ Effort to analyze or communicate intuitive knowledge results in its codification.

in which objects, problems, events, artifacts get constructed and negotiated' (Brown in Choo,1998:118). Such community formed around practice shares a lifeworld. The group, 'practice and cultural knowledge together with their environment constitute a lifeworld.

I will distinguish two specific kinds of cultural knowledge which are important for my analysis, cognitive tools and institutionalized norms. Cognitive tools include concepts and affective structures, interpretative schemes, assumptions, conventions and beliefs. It is the tool we use to conceive reality and to learn. Such knowledge assigns value to new information and forms the framework in which individuals construct reality (Choo,1998:112). Cognitive tools also provide the skills for decoding information (Boisot, 1995:203).

Institutionalized norms indicate the appropriate behaviour in a given contexts. They include social relations, social practices and intuitive organizational knowledge.

3.2.2 Codified Knowledge and Information

Codified knowledge is knowledge that can be readily recorded. It is a symbolic representation of some reality (perhaps imagined in the case of normative or instrumental knowledge). Codified knowledge is produced by articulation of reality into interconnected conceptualized features which can be then associated with some symbols. The association between the conceptualized features and the symbols is by the means of a codification scheme which is merely a social convention, a kind of cultural knowledge.

The codification of knowledge produces some important benefits. It much improves our capacity to store and diffuse knowledge. Codification also makes knowledge objective and allows comparison, testing and rational development of knowledge. Since codified knowledge can be recorded and thus separated from the human mind, it becomes an objective reality. Both its producer and others can assume an objective critical stance in relation to it. As a result, codified knowledge can be critically analyzed and be intersubjectively tested. Intersubjective testing gives knowledge a degree of objective validity even when practical testing against reality is not possible. This characteristic of codified knowledge makes possible the design of apparently objective rules, which are important for the differentiation of system from lifeworld.

Another benefit of codification is that it makes possible production of knowledge independently of practical action and reality, through abstract thought. As knowledge is codified and analyzed, the rules of its structure can be identified. These rules then can be used to synthesize new knowledge in the form of abstract structures. Objective reality as well as social relations then can be shaped in correspondence with this knowledge. This makes possible rational structuring of system.

Codified knowledge also has some limitations. While it has an objective character, the same is not true of its meaning. The connection between codified knowledge and the reality is neither inherent nor objective. The fact that there is no inherent correspondence between reality and codified knowledge means that there cannot be an absolute or total codification of reality.

Knowledge can be codified only to a higher or lower degree. The higher the degree of codification, the more features of reality are conceptualized and identified. Such knowledge then leaves less room for misinterpretation. More codified knowledge allows better discrimination between classes of real phenomena and thus better communication, more consistent reproduction of actions, etc..

For the following discussion I also need to provide some definition of information and elaborate the nature of the relation between information and codified knowledge. There is little difference between information and codified knowledge; information can be seen as any part of codified knowledge. The two terms are often used interchangeably. One difference is that information has no meaning on its own but only in relation to the knowledge that was used to produce it.

3.3 Ways of Acquiring Knowledge

There are basically two ways in which individuals can increase their knowledge: they can either gain access to some existing knowledge or they can develop new knowledge themselves. In reality, our knowledge is always gained through a combination of the two ways.

3.3.1 Acquiring Existing Knowledge

There are some preconditions that have to be met so that an individual can acquire some existing knowledge. These preconditions are different for codified and for intuitive knowledge. They are relevant for my analysis because they indicate

the possible ways of knowledge control by an exclusive group.

Existing intuitive knowledge can be acquired only through socialization in the lifeworld that reproduces the knowledge. There is really only one precondition for gaining knowledge in this way: one has to share the lifeworld with the holders of the knowledge. One has to be accepted, and has to spend sufficient time in the group and participate in the group activities. This means in practice that one must be a member of the group.

The level of involvement and length of time are required because acquiring knowledge in this way is a slow and indirect process. The holders of the knowledge cannot assemble the knowledge and pass it on in bulk. The knowledge is recalled only by specific circumstances and so one has to live through a sufficient range of events and situations with the group. Even when evoked intuitive knowledge cannot be transferred in any direct way. It can only be inferred from actions and communication in a specific context. Some intuitive knowledge can also be communicated indirectly through analogies, metaphors and stories (Choo,1998:117).

The fact that acceptance in the group is necessary to acquire intuitive knowledge held by them points to possible ways in which the diffusion of intuitive knowledge can be controlled. Lifeworld can be shared on different levels. While some level of lifeworld is shared across the society, smaller and close-knit groups share additional intuitive knowledge. Apart from the general culture of the society, they also share some exclusive cultural knowledge that is not accessible to the rest of the society. The diffusion

of this knowledge can be controlled by restricting the participation in the group's activities and by restricting access to the social circles of the group.

In the case of acquiring knowledge through socialization the interest in the knowledge is automatic. Meaning is an inseparable part of cultural knowledge. Another characteristic of knowledge acquired through shared lifeworld is that it tends to be practically usable. Sharing a lifeworld usually involves doing.

The objective nature of codified knowledge has important implications for its storage and communication. Such knowledge can be communicated through information without suffering any deterioration. Assuming some basic shared culture information can communicate knowledge relatively independently of lifeworlds and so independently of geography, time and personal interaction. Increasing personal knowledge through information is also faster than the alternative methods.

There are more preconditions for acquiring knowledge in this manner. To start with, it is necessary to have access to the information. In the industrial system, restricted access to information is common, and is often seen as a functional imperative. The information networks formed by organizations are also fragmented and use different codification schemes. Another precondition is that the knowledge one is trying to acquire is codified. There are disadvantages in codification of knowledge. Codification requires effort and, as long as knowledge is not codified, it does not have to be 'declared'¹⁴.

¹⁴ It may not even be recognized that the knowledge exists.

The fact that information has meaning only in relation to some knowledge points to one more precondition. The producer and receiver of the information have to share some common base of knowledge before information can be used to communicate additional knowledge. There are, in the main, two kinds of knowledge that need to be shared. One kind is cultural knowledge which includes the codification scheme, its assumptions and other related factors. The other kind of knowledge that needs to be shared is codified knowledge that provides a context for the information.

The three preconditions again provide a means for controlling the diffusion of knowledge. The first and most obvious way is to restrict the access to the information. Since codified knowledge, particularly the knowledge of the system, is a source of power, it is not likely to be freely diffused. The second way is that the diffusion of knowledge is restricted by not codifying it or codifying it only to a small degree. Finally, knowledge can be controlled by controlling the diffusion of the knowledge providing the context needed to make sense of the information carrying the knowledge. When the meaning of the information pertains to some exclusive cultural knowledge, only those socialized to the lifeworld are able to make use of the information to expand their knowledge. For the rest of the population, the information appears just as noise. An advantage is that there is no need to restrict access to the information.

Even when the information has a meaning and increases the knowledge of the receiver, the knowledge still is not fully effective for guiding practical actions. To improve the capacity

for decisions and actions, codified knowledge gained through information has to be absorbed (Boisot, 1995:206,211) or internalized (Choo,1998:125). Codified knowledge is absorbed through its use as instruction in practical situations. This means developing intuitive knowledge by practice guided by the codified knowledge. Such learning is much more effective than blind experimentation.

When acquiring knowledge through information, interest in the knowledge is not automatic. Such knowledge has to have some utility or meaning with respect to the individual's lifeworld. Interest in the system knowledge is determined by the material interest of the actors. This means that the knowledge required for the function of the individual in the system is of interest.

3.3.2 Developing Knowledge

Individuals can also acquire knowledge by developing it themselves. Such new knowledge always builds on some existing knowledge. Generally, knowledge can be developed only through observation or through control, which also requires observation. When the object of interest is the system the control is exercised by means of the steering media. There are two preconditions for developing knowledge. The individual developing knowledge has to have the capacity to observe the object of interest, i.e. the system. He has to also have some initial knowledge including cognitive tools like conceptual framework, cognitive structure and some metaphor indicating the system function. This knowledge indicates what is to be observed, how the observations are to be

interpreted and how the pieces of new knowledge are to be put together. Knowledge is developed through the testing of hypotheses and some metaphor of the system's function is necessary for generation of the hypotheses. The quality of the metaphor and of other cognitive tools greatly influences the effectiveness of the observation and so the quality of the knowledge gained.

The capacity to observe the system cannot be taken for granted because the system cannot be observed directly by the senses. One reason is that system is too large and too complex for a single person to survey. The second, and more important, reason is that the system relations are an abstract concept. They are formed by patterns of actions and these can only be detected over time by somebody familiar with the specific local context and can abstract from the multitude of actions what is relevant, what constitutes the system relations. Obviously, one can get to know intimately only so many specific local situations. This means that the system can be observed effectively only through information that is produced by a number of people across the system.

3.3.3 Control of Information by Steering Media

Because of its importance for the development of knowledge I need to take a look at how information is controlled in the system. In the industrial system information is produced and circulated by the formal system institutions¹⁵. These institutions are controlled by the steering media. This means that those

¹⁵ I may also use the term organization for formal institutions to distinguish them from meta-institutions.

controlling the media can also control what information is produced and how it is diffused.

There is a difference between the control of information in power-regulated relations and in money-regulated relations. In power-organized relations the information diffusion is controlled directly by the medium of power. Most information flows are enclosed within organizational boundaries and follow the lines of reporting moving up through the hierarchy from the frontline workers interacting with the organization's environment to senior management. The information is aggregated and generalized as it moves up through the organization and so it increases in importance for the control of the system.

The money-regulated relations rely more on uncoded knowledge and so there is less information produced. The individual cannot decide on actions just on the basis of formally codified knowledge and information. The information produced, however, tends to be relatively freely diffused. This includes the information required for the function of the market mechanism like prices, supply of goods and so on. There is little information on actual transactions that take place and, even if not protected, this information is not easily accessible. This means that, for the most part, only the participants gain knowledge from transactions.

Generally, the system is not organized to provide information for an independent observer. Information is produced as required for the function of those controlling the media. There are only function-specific, fragmented information networks each covering

only part of the system function or a part of geography or economic unit. As mentioned, information has meaning and increases knowledge only if it is related to the actors' interests, actions and knowledge. As a result, much of the diffused formal information in economy has little meaning for the general public. It is the knowledge of the context which is held by the dominant class that gives it meaning (Boisot, 1995:151). That is why the control of the media provides better conditions for developing knowledge. Those controlling the media can also make sure that the information they need is generated. Such information fits into their conceptual framework, their interest and their knowledge.

3.4 System As Codified Knowledge

I have argued that knowledge of the interconnection of goal-oriented actions is one of the kinds of knowledge important for the control of the media. I need to find out what determines the actions in the system and so how they are interconnected. What makes possible action coordination on a society-wide scale is institutionalized norms, usually referred to just as institutions or meta-institutions. Institutions interconnect actions by prescribing actions, or a range of optional actions, in specific situations, and thus depending on the preceding actions. In this way, institutions form social structures which provide predictability and consistency of actions and indicate to actors how to elicit a desired response from others.

Institutions can be seen as a mechanism for storing knowledge developed for social actions so that it is available for the

reproduction of actions (Boisot,1995:273). Institutions guide future actions so that the situation does not need to be analyzed and negotiated for every individual action. In my classification scheme, institutions can be understood as normative cultural knowledge. As cultural knowledge, they can be stored, or rather reproduced, only through the practice of social actions in a shared lifeworld. This means that institutionalized norms can support action coordination only on the scale of the lifeworld reproducing the norms.

When the lifeworld started to differentiate as a result of the division of labour, the reproduction of institutions became a problem. Society-wide institutions could not be reproduced through the differentiated lifeworld and different means of storing knowledge representing norms required for action coordination were required. To ensure that norms were system-wide, they needed to be codified and recorded. Once recorded, norms could be distributed and applied across the system.

Institutionalized norms prescribe actions in respect to the lifeworld context. Codification and abstraction of norms makes possible uncoupling of the interactions and action coordination from the lifeworld context (Habermas, 1987:183). It makes possible construction of system relations which can replace the lifeworld context. System actions are determined by the codified system norms and various parameters representing codified state of system, lifeworld and objective reality. These parameters can be imported in the form of information and used to create context for actors' decision or directly determine actions. Since these

parameters, as well as codified norms, can be communicated in the form of information, actors no longer need to be in personal contact in order that their actions are interconnected. Actors then can take actions on the basis of system information, independently of their lifeworld.

The differentiation of system and codification of norms are mutually reinforcing developments. Codification of norms makes possible the differentiation of the system from the lifeworld by allowing coordination of actions by the steering media, while the differentiation of the system increases differentiation of the lifeworld and necessitates more codified norms. The coordination of action by the steering media requires that particular relations are subordinated to abstract and universal norms (Habermas, 1987:286) because a standard response to the media influence is required. Universal norms allow the system relations to be society-wide with sufficient predictability and without actors having to experiment and explore varying local customs.

There is a difference between the two subsystems with respect to how much codification is required. The medium of money requires relatively little codified knowledge for its function through the institution of the market. It requires some rules for market exchange and the organization of the industrial economy by money relies on enforceable contracts. In relations regulated by money, actors can exercise their agency to decide on actions with consideration of the market conditions.

Coordination of actions by the medium of power requires more codified knowledge. Because the medium of power cannot be applied

directly on a large scale, senior managers regulate actions by dividing responsibilities among abstract positions and providing instructions for each of them on how to deal with classes of issues and situations. They codify the functions of the organization. Taylor and Van Every (1993:128) call this codified function of organization a 'text'. Text makes possible a consistent and relatively accurate control of actions. It removes lifeworld context and agency of individuals by 'programming' the actions. This makes possible control of actions by the medium of power regardless of the individual actually executing the actions and the location or time.

Codification makes possible much finer differentiation of norms than was possible with institutionalized norms. Unlike lifeworld or the human mind, records can hold unlimited volumes of knowledge representing norms. Actors only need to refer to the part of the codified norms relevant for their position and the specific situation. The objective nature of codified knowledge and the possibility of storing unlimited volumes mean that codified knowledge then can be used to determine the function of parts of the system. Rather than codified norms, this can be understood as a codified function.

The codification of the system function means that the codified knowledge constitutes the system structure. This knowledge then determines the functional imperatives and has to be considered in the control of the steering media. If the system was fully codified, the texts as the codified function would provide all knowledge required to determine the interconnection of

actions. As I will discuss below, the industrial system cannot be not fully codified and so the texts do not fully determine the system actions. In addition, it is not possible for anybody to have understanding of all texts in the system. Their volume is far in excess of the capacity of the human mind.

3.5 Limits to Codification of System

Since codification improves the efficiency and performance of the system it is a functional imperative to codify the system function as much as possible. There are, however, limits to system codification. A complete codification of the system consisting of people and printed records as the means for holding the system knowledge is not possible. There are three reasons why the system codification has to be limited. As with any codified knowledge, there is actually no natural, inherent correspondence between the reality of social relations and codified knowledge representing the system function. For codified knowledge to have any utility, a correspondence needs to be established by the convention of a codification scheme. Such codification scheme can be only in the form of intuitive, or rather cultural, knowledge. Since intuitive knowledge is necessary in the system for connecting codified knowledge of texts to reality, the system cannot consist solely of codified knowledge, i.e. be fully codified.

The standardization of the connection by means of codification scheme does not solve all problems with codification of the system. Another problem is the complexity of the social reality, whether it is a part of the system, or the lifeworld as

the object of the system function. There is an infinite number of possible actual social situations while the size of the text is practically limited because of the time required to produce it, difficulties with integrating large volumes of codified knowledge, etc.. This means that texts have to generalize, they have to deal with classes of actors, issues and actions. Again, only some intuitive knowledge which changes together with the society's lifeworld can assign social phenomena to the categories created by codified knowledge.

Another reason for a limited codification is that the degree of codification that actually produces optimal system performance is still lower than what is possible. The reason why excessive codification of the system is not desirable is that codification increases the rigidity of the system. The system needs to be flexible to be able to keep up with changes in the lifeworld and in natural environment. The problem is that codified knowledge is fixed. Intuitive knowledge, when used, changes to accommodate changing conditions, not so codified knowledge. Codification restricts the range of application of intuitive knowledge and so limits the capacity of the system for adaptation.

To change codified parts of the system requires an extra effort. This means that it is costly and also takes time. The more codified the system is the more likely it is that a change in environment will require some change to codified knowledge. When a change to codified knowledge is necessary, it is desirable that the change is limited to a small part of the system. This can be achieved by a flexible coupling between codified parts and can be

provided only by intuitive knowledge. Small changes in the environment then can be accommodated in the corresponding part of the system and do not necessitate re-codification of the whole system (Weick in Taylor and Van Every, 1992:98,126).

There is one more limit to codification in the industrial system. System parts consisting only of a codified knowledge, i.e. with no intuitive knowledge, are organized exclusively by means of information. The industrial system relies on the human mind for the processing of information. The human mind, however, has only limited capacity for processing information, it is better suited for applying intuitive knowledge to uncoded reality. Excessive codification would exceed the information-processing capacity of the people and cause system malfunction.

3.6 System as Combination of Codified and Intuitive Knowledge

I will look now in more detail at the function and nature of intuitive knowledge in the system. The system can be seen as blocks of codified knowledge, i.e. texts integrated together by intuitive knowledge¹⁶. Intuitive knowledge is needed to connect the texts, to provide the interface between individual texts and also between texts and the system's environment. Texts may include codified knowledge prescribing the relations with other texts. What makes the texts separate, determines the boundary, is that

¹⁶ These blocks should not be seen as necessarily coinciding with economic units; they may cover several units or just a part of one. Contractual agreements, for example, bridge economic unit and the tax regulations cover the whole economy.

different texts may prescribe the relations in a different way, i.e. that the texts are not compatible. This may be because the texts represent different interests or the codification schemes used to produce the different texts may be different. Intuitive knowledge then is needed to provide interpretation between the different codification schemes or to reconcile incompatible texts. Intuitive knowledge is also needed for interfacing with uncoded reality. Taylor and Van Every (1992:109) call these functions of intuitive knowledge in the system conversation. Conversations represent the actual system function. This function, while directed by the texts, is not determined by them. Intuitive knowledge of individual serves as an interpretative scheme.

The specific function of intuitive knowledge depends on the nature of the contexts that it is interconnecting. One kind of application is that intuitive knowledge codifies some reality (lifeworld, other system relations etc.) in the terms of the text and so produces information that can be processed by the codified knowledge. Thus, for example, information on economic outlook, competitors and consumer market trends can be used to produce information on the expected demand for the goods manufactured by the company. Intuitive knowledge is also needed to provide interpretation in the opposite direction, i.e. the prescriptions of the text have to be realized as actions appropriate for a specific context. Text prescribing the relations with suppliers has to be translated into personal interaction between a buyer and a supplier in such a way that the goals prescribed are achieved.

There is another, different function for intuitive knowledge

in the system. Some intuitive knowledge also has to organize relations between codified blocks when there is no codified knowledge to provide instructions regarding what the relation should be like. Taylor and Van Every (1992:125,126) use the concept of master conversation¹⁷ to describe this application of intuitive knowledge in the system. Master conversations are conducted by senior management. They negotiate actions and relations purely on the basis of intuitive knowledge of the individuals involved (and their interest). They do not use any instructions or formulas to determine their actions¹⁸.

The product of a master conversation can be a one-time transaction or master conversation can write a text which allows the following transactions of similar nature to be executed more routinely. This means that it is the function of master conversations to structure the system by developing the codified knowledge, i.e. to write the texts (Taylor and Van Every,

¹⁷ Taylor and Van Every use two concepts, master conversation and macro-conversation. The term master conversation is used for the conversation dealing with internal relations of organization while in macro-conversation representatives from different organizations negotiate their relations. The difference is not important for my analysis and I will use the term master conversation.

¹⁸ Senior managers have to consider laws and regulations but no text defines their objectives or provides guidance how to achieve them. They may also use some codified knowledge to improve their understanding. The codified knowledge in such case, however, is only an instrument, they can use their discretion as to whether and how to apply it.

1992:126). The reason for writing a text can be to improve some function using new technology, to accommodate changes in the environment or to reconcile incompatible texts when the discrepancy between them cannot be bridged by the interpretation.

The way I have described the interaction between the codified and intuitive knowledge, how a text determines the action, is a considerable simplification. Actors rarely follow the codified knowledge literally, read or memorize the text to determine the appropriate actions. In reality codified knowledge can influence actions in the system in a range of ways between two limit points. One limit point is when the text is followed step-by-step, like a formula. The application of the codified knowledge in this case is relatively simple and there is little interpretation required. The outcome is the same no matter who executes the interpretation. The other limit point is that the codified knowledge provides only high level instructions that cannot be simply followed. It needs high level intuitive knowledge to be interpreted for specific situations. Rather than following the instructions the actors internalize the codified knowledge of the text. This knowledge becomes a part of their personal knowledge and directs their actions in a way similar to institutionalized norms. The text can be then understood to shape intuitive knowledge and institutionalized norms that actually control the function. In the case of conflict or doubt, it is possible, however, to refer back to the text. Generally, the higher the position, the more general the text is and the higher the level interpretation that is needed. Middle level managers may have specified only the

objectives, budget and the basic philosophy of operation. Their function is to write more specific texts for their subordinates.

Another simplification was in indicating that the influence between the text and conversation is unidirectional. In reality the influence goes both ways. When interpreting texts while trying to achieve prescribed objectives in changing conditions, people innovate. Successful solutions are established as habits or customs. When such customs are recognized as important for the management's objectives, they are codified and become a part of the text. Other spontaneously formed customs may remain unnoticed or may be explicitly forbidden if seen as undesirable by the management. In spite of these simplifications the above model of system function is still acceptable for my analysis. Senior managers, although they do not have absolute control, ultimately prevail on issues they see as critical.

The system then can be seen as consisting of three kinds of knowledge, codified knowledge of the texts and the two kinds of intuitive knowledge. These three kinds of knowledge determine the actions in the system and an understanding of their nature can help in analyzing the impact of IT. I have discussed the development of the codified knowledge in the system. Now, I will turn my attention to the two kinds of intuitive knowledge. Both kinds can be seen both as objective and subjective. They are part of the system and also give the individuals who hold and apply the knowledge some understanding of the system. The two kinds of knowledge differ, however, in the nature of the understanding and also in how they are controlled. To understand their nature and

their role, I need to examine how and under what conditions they are developed and reproduced.

3.7 Secondary Lifeworld as Part of System

First I shall look at the kind of intuitive knowledge that is provided by most people in the system, the knowledge required for conversations and interpretation of texts. Knowledge that guides people's actions is intuitive knowledge that is mostly developed by practice of actions. The factors that determine the actions of individuals in the system - and thus what knowledge they develop - are the objectives of the actions and the environment, i.e. the social and objective reality, in which the action takes place. The reality can be divided into two parts; one part is given and has to be accommodated, while the other part can be controlled in order to achieve the objective. Both kinds of reality are perceived through the 'lens' of the cultural knowledge that the individual shares with some group. The reality conceived this way forms a lifeworld for the individual.

When individuals function as a part of the system, the latter forms their lifeworld and provides the context for their actions. The system becomes for them a second nature, an objectified context of life (Habermas, 1987:173). Since this lifeworld is formed by the system relations as a 'second nature' I call it the 'secondary lifeworld'. This lifeworld is different and separate from the 'primary' lifeworld of the actors. In the primary lifeworld the objectives of actors' actions are determined by their personal interests and lifeworld imperatives. Their social

relations are determined by the family, strategies employed to promote their interests and by their personal preferences. In the secondary lifeworld, the objectives as well as relations are prescribed by the text. The text is a part of the objective reality for the secondary lifeworld and replaces the primary lifeworld as the context for actions. Since the text is not sufficient by itself to determine actions, the secondary lifeworld has to provide context for the interpretation of the text. It connects abstract functions of the texts to specific people, and other abstract concepts to concrete features of the specific situation. The text also provides some instruction on how to achieve the objectives. There are few lifeworld imperatives generated by the secondary lifeworld.

As noted, the culture of a group constructs the secondary lifeworld of the group's members, i.e. the reality is perceived through the culture. The cultural part of the secondary lifeworld is developed in this environment formed by the system¹⁹. In a differentiated system, cultural knowledge can be developed and reproduced only by a relatively small and stable group whose members interact regularly. Weick (in Taylor and Van Emery, 1992:96) calls such groups in the system 'segments'. Segments share position in the system and develop a common basis of understanding. The part of system within their horizon becomes their secondary lifeworld. Since the system also bursts out of the horizon of the primary lifeworld and escapes intuitive understanding of individual actors (Habermas, 1987:173), only the

¹⁹This culture is developed on the basis of the culture of the society.

part within the horizon of the secondary lifeworld is intuitively understood.

There is a multitude of secondary lifeworlds in the system. They overlap and form environments for each other. Cultural knowledge developed in secondary lifeworlds is important for the system function. Individuals must have a common understanding of the situation, i.e. they have to share cultural knowledge, to be able to effectively participate in conversations. The cultural knowledge reproduced in secondary lifeworlds depends on the position of the segment in the system. Individuals develop a personal knowledge of the system from the perspective of their secondary lifeworld and on the basis of the cultural knowledge²⁰.

The nature of secondary lifeworld determines the knowledge individuals have of the system. From the above discussion, it is possible to identify three reasons why individuals providing intuitive knowledge for conversations and interpretation of texts in the system do not develop effective knowledge of the system required for control of the steering media. One reason is that each of these lifeworlds (the horizon of the segment) covers only a fraction of the system. The horizon is determined by the system monitoring required for the segment's function. No information is provided formally by their positions on the rest of the system.

²⁰ Individuals do acquire some knowledge of the system outside their system function. This may be through formal education, from the mass media, etc.. Such knowledge, however, tends to be fragmented and it is not connected to the experiential reality. As a result, it is not very effective in practical situations.

The second reason is that individuals in these positions have little motivation to develop more comprehensive knowledge of the system. They do not need it to execute their function in the system, i.e. they do not need it for their material interests or any personal interest because it is not a part of their lifeworld. The last reason is that the system relations are reified from the perspective of secondary lifeworlds. They appear as given reality, second nature, which they cannot influence. This second nature is constituted by the text and the culture reproduced. These three reasons indicate that secondary lifeworlds do not offer suitable conditions for developing the knowledge of the system required for control of the media.

Another question is to what extent knowledge of these lifeworlds (as an objective part of the system) is required for the control of the media. These lifeworlds tend to be shaped by the media. They do not generate functional imperatives²¹, rather they have to accommodate the system imperatives, much as they have to adapt to objective reality. This means that the knowledge they reproduce is not necessary for the control of the media.

3.8 Knowledge Reproduced through Dominant Lifeworld

The other function of intuitive knowledge in the system is to organize uncoded relations between blocks of codified knowledge. These relations are organized through master

²¹ The secondary lifeworlds and interpretations of texts do generate some imperatives but, as I will discuss later, they do not give the individuals interpreting texts much say in the control of the system.

conversations conducted by the dominant class. The dominant class can be seen as another segment, another stable group which interacts regularly (Taylor and Van Every, 1992:96)²². The individuals within the segment share the perspective of the system due to the similar positions at the top of the formal institutions in the economic subsystem.

The segment formed by the dominant class is in some ways different from other segments. Senior managers are distributed geographically, across sectors of the economy and in different economic units²³. In spite of the distribution, their interactions are mostly personal, face-to-face. They are continuously 'on the road' because they recognize the importance of personal relations for effective cooperation. This personal interaction means that, like other segments, they share a secondary lifeworld and develop common cultural knowledge. This cultural knowledge is reproduced through the practice of master conversations. Taylor and Van Every (1992:126) view the master conversation as a kind of subculture.

There are other differences between the secondary lifeworld of the dominant class and the secondary lifeworlds organized around the function of interpreting texts. The absence of text means that text cannot replace the primary lifeworld context, personal interests and social relations. This context remains in

²² Taylor and Van Every talk of senior management in an organization. I expand the concept to the entire dominant class. This is possible because of the personal interaction between individual members of the class.

²³ Union members may communicate across the system but they are not primarily concerned with optimizing the function of the system.

place and is legitimately considered in the actions of the dominant class. The system only complements the primary lifeworld context in their system function. The objectives are determined by the interests of the dominant class, i.e. the interests originating in their primary lifeworld, including the interest in maintaining their power. This means that the secondary lifeworld of the dominant class is not really separate from their primary lifeworld. The dominant class has only one lifeworld, the 'dominant lifeworld'.

The absence of text has implications for the intuitive knowledge of the system that individuals develop. The guidance for master conversations has to be provided by different means, by intuitive knowledge of individual members and their understanding of the system function. System does not quite escape intuitive understanding of the dominant class. It remains within the horizon of the dominant lifeworld. Since the dominant class has to consider the whole system in their decisions, their interests and intuitive knowledge cover the whole system

Neither are the system relations unquestioned reality for the dominant class. The members of the dominant class write texts rather than follow them²⁴. From the perspective of the dominant

²⁴ Some of the texts even in economy are actually written by the legislators, lawyers and senior managers in the public administration. These texts, however, have to reflect the imperatives specified by the dominant class. Capitalists have superior knowledge of economy because the corporation allows them to shield the knowledge from outsiders and because they depend on this knowledge for their economic survival (Weber in Stehr, 1992:121,134).

class system relations are seen as instruments for achieving their objectives. These relations have been structured by the dominant class, and as a social product they can be negotiated and changed if agreed as necessary for improving the system function.

The relations of the dominant lifeworld are intertwined with the system relations. There is no clear division between them. The business deals are negotiated over lunches, at receptions, during golf games, as well as in the board rooms. Business interests determines social relations and vice versa. The close connection between the dominant lifeworld and the system means that the imperatives generated by the master conversations are really the system imperatives because the dominant class has a more global understanding of the system. The system imperatives cannot be really separated from the interests and understanding of the dominant class.

The conversations interpreting texts also generate imperatives which senior management cannot quite ignore. These imperatives originate in the system's environment and are codified by the conversations in the secondary lifeworlds. The dominant class has to recognize the natural reality and lifeworld based imperatives as well as incompatible texts. These imperatives, however, are fully codified before they reach senior management. They are easy to understand and senior management can weigh them, make their own judgements and decide how to accommodate them to optimize the system function²⁵ without endangering their interests.

²⁵ It is in the interest of those codifying these imperatives to make

In the opposite direction the system imperatives are complex, may be little codified and there is no motivation for the dominant class to make them understandable for their subordinates or the general public.

3.9 The Knowledge of System Developed by Dominant Class

I have indicated that it is difficult to gain understanding of the system because the system is too large and too complex and includes uncoded knowledge. Habermas (1987:184) notes that no one has to comprehend a complete system. Obviously, there cannot be a comprehensive codified knowledge of the system because no codified knowledge can describe relations organized by intuitive knowledge. Individuals can only have intuitive knowledge of the system that provides them with enough insight to guide their actions so that they are able to achieve their objectives. This knowledge tends to indicate how texts are applied, i.e. how the system actually functions, rather than cover only codified knowledge in the system. Part of this intuitive knowledge may be in the form of metaphors, practices, empirical knowledge and rules of thumb. General knowledge is more important because specific knowledge can be developed in relatively short time 'on the job' as required.

No single individual has the capacity to develop even an incomplete intuitive knowledge of the system. Such knowledge can be developed only through accumulating over time knowledge

them understandable, failing which they would not be considered by the dominant class.

developed by a number of people. This knowledge cannot be accumulated as records. Because objective knowledge that interconnects actions in the industrial system is largely uncodified and it changes continuously, subjective knowledge of the system can be accumulated only as cultural knowledge in the form of practices and oral culture reproduced in some lifeworld. The intuitive knowledge of the system developed by the members of the dominant class is accumulated in the dominant lifeworld. That is why the knowledge of senior management is mostly shared through oral culture (Zuboff, 1984:178). It is the advantage of the integrated, system-wide dominant lifeworld that it makes possible the accumulation of uncodified and partially codified knowledge developed in different part of the system without diffusing it among general public. This cultural knowledge is not by itself sufficient for the control of the media but it provides basis for developing effective personal knowledge and also practices that have been proven effective in the control of the media.

Individual 'pieces' of the knowledge accumulated in the dominant lifeworld are initially developed by individuals in various parts of the system and then gradually socialized (Choo,1998:119). The practices as well as cognitive tools can be emulated and tested across the system and only successful knowledge becomes reproduced by the lifeworld. Lifeworld does not simply accumulate knowledge, the knowledge is continuously developed and in the process it is being adapted to the changing reality of the system.

The members of the dominant class together have the

conditions to develop effective knowledge of the system. They can observe the system because they have access to the system information. At the top positions of corporate hierarchies and other economic institutions, they are connected to the receiving ends of formal information channels. The information in these channels is produced for their needs, it is conceptualized and codified using the codified knowledge of the texts produced by the dominant class. This information has meaning in the context of their knowledge and interests.

3.10 Reproduction of Dominant Class through Dominant Lifeworld

The above discussion indicates that there are basically two kinds of knowledge in the system that individuals need to have an understanding of or have internalized (in the case of cultural knowledge) for effective control of the steering media because they interconnect actions in the system and generate functional imperatives. One kind is the objective knowledge that constitutes the system structures, i.e. various texts in a written form or as they may be internalized or just implicitly understood. This knowledge determines actions in a more 'mechanical', predetermined way.

The other kind of objective knowledge is the cultural knowledge accumulated in the dominant lifeworld. Individuals may not be conscious of this knowledge, it is mostly implicit. Individuals with shared cultural knowledge interpret reality and act in similar way. The cultural knowledge includes the interests and meanings held by the dominant class, their understanding of

reality including the system, and the established practices of this class. This knowledge indicates the likely actions of individuals in specific situations and thus, in an indirect way, how actions are interconnected in the system.

Apart from giving some insight into the interconnection of goal-oriented actions, the cultural knowledge of the dominant class is also required for effective communication with individual members of this class. Such communication is necessary for the execution of transactions through master conversations. It is also required for acceptance into the exclusive social circles which serve also as a source of informal proprietary knowledge on the system.

The dominant lifeworld plays a role in acquiring both these kinds of knowledge. The internalization of the cultural knowledge reproduced through the dominant lifeworld is practically automatic for those born into the dominant class. The role of the dominant lifeworld in acquiring the knowledge of the system structure by individuals is less direct. Personal knowledge is developed through life by a combination of means. What knowledge is developed depends both on the reality people live in and on the cognitive tools at their disposal. These tools are mostly acquired early in life as a part of cultural knowledge passed on through the lifeworld by means of socialization in the family. The kind and range of the cognitive tools acquired depends on the social situation of the individual (Choo, 1998:111). Like other cultural knowledge, it depends on the class position of the family (Bourdieu and Passeron, 1990:88). The acquired cognitive tools then

facilitate the development of personal knowledge, through practice and by means of information, and so determine how much understanding of the system individuals develop in given conditions. Some metaphor or simple model of the system function indicates what are the relevant parameters for anticipating actions in the system and thus what information is of importance.

The main opportunities to gain knowledge of the system are formal education and employment. The effect of formal education depends on the interest and the ability to attach the new knowledge to the existing understanding. The distance between the individual's cultural background and the culture of the education system is an important factor in determining the level of education achieved (Bourdieu and Passeron, 1990:116,204) as well as the acquired knowledge. The intuitive knowledge of individuals helps in making sense of codified knowledge taught at school, thus making it understandable and facilitating the absorption of the taught knowledge.

Another opportunity for individuals to increase their personal knowledge is provided by practical experience in employment and by functioning as a part of the system. Here the advantage of the suitable cognitive tools has a snowballing effect. The knowledge acquired, together with social contacts and completed formal education, determine what kind of job one is able to get and so helps in the initial move to the position of control. Such positions then provide more opportunity for developing personal knowledge of the system. By providing

experience with actual control of the media, they help to connect their intuitive knowledge to the reality of the system. The positions of control also provide access to formal information channels which facilitates observation of the system.

That the dominant lifeworld plays an important role in acquiring both these kinds of knowledge required for the control of the media means that this lifeworld and the associated cultural knowledge form the mechanism for the reproduction of the dominant class. The relative importance of the two kinds of knowledge - the culture and the knowledge of system structures - for moving into positions of control, seems to depend on the character and the state of the system. In a static system with stabilized relations, the dominant class culture is likely to be more important. In a dynamic and more competitive system, it is likely that knowledge of the structures has more relevance for gaining control of the media.

This mechanism of reproduction of the dominant class through the dominant lifeworld is similar to Bourdieu's theory of the dominant class reproduction through 'cultural capital' (in Bourdieu and Passeron, 1990). Bourdieu conceptualizes different kinds of capital as forms of 'wealth', which can be used for production and to provide social status. Each kind of capital can be converted into economic wealth as well as into other kinds of capital (Terdiman in Bourdieu, 1987:812).

There are some differences between my hypothesis and Bourdieu's theory which have implications for the possibility of the change of the dominant class. Bourdieu sees formal education

as the main mechanism of discrimination according to culture. In his view, dominant class culture helps individuals in achieving a higher level of education which then determines their positions in the system. Bourdieu and Passeron (1990:165) seem to believe that the diploma has an overwhelming influence on the position and status achieved by the individual. This view is justified because they restrict their interest to a specific system and time. My analysis is more general. I see the discrimination more in the way in which the access to senior positions in the system is determined. I believe that, apart from the achieved level of formal education (and natural talent), the knowledge of system structures, together with the cultural knowledge plays a role in individual's career.

Because of their focus on formal education, Bourdieu and Passeron do not need to pay much attention to the relation between the culture of the dominant class and the system reality. With the means of discrimination, school performance, being largely independent of the system reality, the theory of the dominant class reproduction through cultural capital does not allow for any mechanism by which the dominant class could change. In contrast, I argue that, while the culture of the dominant class is not determined by the system, it has to satisfy the functional imperatives of the system. It has to be compatible with the reality of the system structure and thus it provides an effective interpretative and cognitive tool for understanding the system structures.

The compatibility between the system structure and the

dominant class culture can be achieved and maintained only if there is some interconnection between them. This connection is provided in one direction by formal information channels in the form of organizations, and shapes the cultural knowledge in the dominant lifeworld. In the opposite direction, it is the control of the steering media that shapes the system structure.

4. THE EFFECT OF IT ON THE SYSTEM

This chapter analyses the effect of IT on the system. It argues that IT facilitates increased codification of the system and its integration through information. Another effect of IT is increased importance of information production which results in more dynamic nature of the system. Finally, arguments are presented indicating that the access to information in the emerging system are likely to be more open.

4.1 Increased Codification of the System

I have noted three reasons why the industrial system which consisted of institutions could be codified only to a limited degree. When IT is used to replace people and institutions in the system, it makes possible an increased codification of the system. Now, I will show how IT affects the three limits and thus makes possible higher codification of the system.

The first limit to codification stems from the lack of any inherent correspondence between codified knowledge and reality. This means that all codified knowledge has to be interpreted by some intuitive knowledge (convention of interpretation scheme) to determine the action. Codified knowledge in the form of a written text has to be read and interpreted by somebody to evoke some intuitive knowledge and only then can the interpreter execute the actions according to her understanding. IT permits conversion of codified knowledge to action by standardizing the connection between codified knowledge and reality, by digitizing reality instead of using intuitive knowledge in the form of a convention.

In a way, mechanical technology also allows direct conversion of codified knowledge, in the form of some machine, into actions. The difference is that IT allows an easy change of codified knowledge. It also allows the transfer of the knowledge which means that actions in different parts of the system can be interconnected. Information representing the result of one action can be easily compared with other codified knowledge and used to determine other actions. This is conditional on standardization of the codification schemes and integration of the codified knowledge. For a mechanical instrument to accommodate changed conditions, the codified knowledge, i.e. the equipment itself, had to be laboriously adjusted or replaced. IT can be controlled by very large volumes of codified knowledge and so it can prescribe actions for nearly unlimited range of expected conditions. This means that IT makes possible full integration of a system of actions on the basis of codified knowledge as long as there is no need to change the system, i.e. as long as the possible range of conditions can be predicted. In reality it is necessary to change the codified knowledge in the system on a continuous basis because changes in the environment cannot be predicted. This means that some intuitive knowledge is required in the system for monitoring the system's performance and for codification and recodification of the system's function. Since codified knowledge in the form of software programs can be changed relatively easily unexpected conditions can be dealt with by using a limited application of intuitive knowledge.

The second reason why a system cannot be fully codified is that it would become too rigid and slow to accommodate changes in its environment. In the case of a function directed by internalized text, which is the most common case, there are two sources of rigidity: one is the effort that is required to change the codified knowledge and the other is the time required for the interpretation and internalization of the new text by the individuals executing the actions. Frequent change of texts are also likely to cause confusion and system malfunction. Since IT can convert codified knowledge directly into action, it removes or reduces one source of inertia in the system, the internalization of text. Parts of system implemented in IT can be changed as fast as they can be recodified.

As Quintas (in Mansell and Silverstone, 1996:89) notes, IT has its own rigidity caused by the investment in the existing infrastructure and software programs which represent a commitment to the existing technology. It is still easier, however, to reprogram (even replace) technology than to change internalized knowledge. IT systems can be more easily bypassed, there is only an economic cost. Bypassing an institution would mean making people redundant and that, apart from ethical issues, also means resistance on the part of those affected.

It seems also that the inertia of codified knowledge is less of a problem in an IT-based system. As I will discuss next, there are reasons to believe that an IT-based system is inherently more dynamic, that it can be expected to change more or less continuously due to the effort invested in the production of

The main advantage of a system is intuitively transmitting information to the system. It can more easily accommodate changes in the environment. The adaptation is more through the interaction of the individuals and less through conversations and formalized descriptions.

The main disadvantage of a system is the limited capacity of the system to process information. IT has much greater capacity for processing information using codified knowledge. It is able to store and retrieve information much more effectively and is more reliable in processing information.

The possibility of increased codification has consequences for the nature of the system. Intuitively guided practices of management will become objects of textualization (Taylor and Van Every, 1993:198). Increased codification can increase the complexity of the system while reducing the need for intuitive knowledge and people in the system.

With increasing and standardized codification the system can be integrated more by information. Actions become independent of any lifeworld context and can be interconnected directly by information without the need for conversations. There are more blocks of codified knowledge (functions) which process clearly defined input information.

A system integrated by information can be increasingly monitored and rationally analyzed through this information as system events are revealed comprehensively (Zuboff, 1984:179,181). The information that mediates individual relations is recorded and produces indicators of the state of the system. Such analysis

provides better guidance for action than cultural knowledge and an indication of the state of the system communicated through the proprietary channels of dominant lifeworld.

4.2 Dynamic System, Profits Generated through Change

It is quite obvious that the system has been becoming more dynamic in recent years. This could be just a temporary phenomenon caused by changing conditions like globalization and deregulation, even though connected to the use of IT. In such case the system could be expected to stabilize once it has adjusted to the changes and as new regulations are put into place. As I will show below, there are reasons to believe that an information economy is inherently dynamic. If this is the case, any new regulations would need to be flexible enough to accommodate change.

The changes in the system are driven by the transformation of the economy. Manufacturing, which has been the main source of profits in the industrial economy, is being transformed by the capacity of IT to convert codified knowledge directly to action and to interconnect actions by means of information. This capacity makes possible a flexible automation of production. There was some automation of production before the introduction of IT but that automation was mechanically based, it was not flexible. Change of product required expensive retooling, large effort and extensive use of intuitive knowledge for product development, organization of production process, reconfiguration of production lines etc.. The costs associated with the introduction of a new product and the time required discouraged competition from emulating

successful products. While the initial cost was high, the cost per unit was very low for such large volume production. Mechanical automation generated the imperative of scale. The large scale of production allowed distribution of the initial cost over a large number of products. Once a company covered the cost of product introduction, it could substantially lower the prices, if required to beat competition, and still make a profit. This made possible long and profitable production runs by a small number of large companies.

IT-based flexible automation brought universal production tools and high degree codification of design and production process. Information became a production tool as well as an infrastructure of management (Taylor and Van Every, 1992:170). The introduction of a new product may now require little more than downloading the information for the control of the production line. Both product design and production process can be bought as information or can be assembled from existing modules with relatively little effort.

The fact that there are few changes to the physical production tools and that a new design requires relatively little effort makes product introduction much cheaper and faster. Competitors can introduce similar products in a short time and with relatively low cost. As soon as they catch up and supply a similar product the profits of the market leader plummet. To maintain their profit margins market leaders have to continuously keep changing products. Profits are now generated more through change of products than through the scale of production.

These frequent changes of products stimulate innovation and translate itself into changes in the functions and relations of production. Standardized codification and global information networks also make possible the separation of various parts of the production process - i.e. product conceptualization, design, manufacture, assembly - between different locations and economic units. The distribution of the production process can be optimized independently of ownership, organization, geography and culture and it allows the concentration of resources and expertise. The distribution can be optimized on an ongoing basis, according to changing conditions of regulations, market for the goods as well as labour market, resources and expertise of firms etc..

4.3 More Open Access to Information in Dynamic System

Information networks²⁶ obviously have different effects on the distribution of knowledge and power depending upon whether they are open or closed. In the case of information networks consisting of IT, both kinds are technically equally feasible. The functional imperatives of the system will likely determine how open information networks are. I argue that the functional imperatives of the information economy, based on the existing system and knowledge, require that information networks provide more open access to information than has been the case in the

²⁶ I use the term 'information networks' rather than 'information systems' to minimize confusion with the social system. The term system would be more appropriated because information networks not only move information, they also produce it.

... that all information will be available to everyone, that there will be equality of information, and that senior management will not have any special access which is determined by position in the organization. It is for all these reasons why I believe that the information economy will need to be re-open.

Production of Information

Production of information represents a growing part of the economy and is becoming the main source of profits. Since the nature of information production is different from that of material production, the nature of relations within the economy must change.

There are a number of reasons why production of information is growing in importance, why it generates an increasing share of profits. To start with, information represents much of the value even of material products (Taylor and Van Every, 1992:170). As discussed, profits in production of physical goods are mostly generated by continuous change of products and this change is facilitated through the production of information. Information itself is also becoming commodified; it is distributed through the mechanism of market exchange and generates profits directly. Codified product design, production and management tool can be sold in the form of information. Some kinds of information - like video games, software programs, reference and educational databases - become directly consumer goods. The increasing demand for information and the increasing profits it brings stimulate

information production. Corporations put more and more resources into the production of information and many of them even produce only information. Information production is increasing in importance as a source of economic power and prosperity.

As the economy is moving to information production its organization needs to change. Industrial production has been organized through autonomous corporations with bureaucratic structure. Taylor and Van Every (1992:165) and others show that bureaucracy is not suitable for the organization of information production. Bureaucratic organization has been effective in the industrial economy because it provided, through rational central control, a mechanism for coordination of actions as well as for motivation of workers. Bureaucracy, however, is not suitable to provide these functions for the production of information. As I have discussed, the control of the direction of actions in bureaucratically organized corporations is by means of texts that prescribe the actions. Restricted diffusion of information ensured that the authority of management was not challenged. The incentive was provided by rewarding individuals according to their performance or through the standardization of their function (Taylor and Van Every, 1992:164).

In information production, control and motivation need to be achieved in a different way. Information production cannot be standardized and the performance of individuals cannot be measured in any meaningful way. Bureaucracy's capacity for action coordination and direction of action is also diminished. It is not possible to prescribe the steps for the production of information

with intuitive knowledge²⁷. Hierarchical control can be effective only when the superior has a better understanding of the task or if she knows what the outcome of the work is to be and can judge the actual result against it (Taylor and Van Every, 1992:164). Neither can be generally true in information production.

Taylor and Van Every (1992:165) argue that, of the possible ways of coordination of production listed by Mintzberg²⁸, only coordination by mutual adjustment is suitable for information production. It is the only method of coordination that provides room for creative application of intuitive knowledge. The method of coordination of production determines the requirements for the design of the information network in the organization. In the case of coordination by mutual adjustment, neither the functions of individuals nor their relations can be clearly defined. This means that it is not possible to determine in advance the required input information or to prescribe the information flows as would be required for the design of a closed information system. To be able to mutually adjust, individual actors need to have a general knowledge of the other's work and of the goals and plans of the organization. For all workers to have such knowledge the access to information needs to be open (at least within a group responsible

²⁷ Where codified knowledge can be used to produce information the function can be executed by IT.

²⁸ The other four mechanisms of coordination noted by Mintsberg are: direct supervision, standardization of work, standardization of output and standardization of skill.

for a project). This way each individual can monitor information flows and search the files for the information they need. Information networks need to be transparent for effective coordination of information production (Taylor and Van Every, 1992:171). Restriction of knowledge to prevent any challenge to authority would negatively affect the performance of the organization.

4.3.2 Diminished Need to Protect Knowledge in Dynamic System

Another reason why IT is likely to bring more open information networks is that dynamic knowledge needs less protection to maintain a knowledge differential between the producers of the knowledge and the rest of the society. In a static system the subjective knowledge of an actor is also static²⁹. Actors do not need to put much effort into developing their knowledge to be able to take effective action. Knowledge in a static system is effective because the interpretations of codified knowledge have stabilized and standardized and so the actions are predictable. The knowledge also has been tested and perfected over time. Access to such knowledge provides reliable guidance for actions and gives a definite advantage to its holder. For these reasons, subjective knowledge of the system has to be protected because if others obtained access to it they could

²⁹ There is no truly static system. The classification is relative and may depends on relation of the system change to the rate of lifeworld reproduction.

compete for power. The main way by which knowledge can be protected is by restricting access to information, by developing closed information networks. Bureaucratic organization is the most obvious example of such closed information networks.

In a dynamic system, all knowledge of the system actors have ages and loses its effectiveness rapidly. To be able to take effective action, actors have to keep developing their knowledge of the system. (By developing knowledge they contribute to change in the system.) Such knowledge then needs less protection. Even if others manage to acquire the knowledge, the time required to find, understand and absorb the information is likely to make the knowledge outdated. The faster the production of knowledge, the less restriction on its diffusion is needed to produce a differential in the knowledge held by the producers and the 'receivers'. 'The greater the tempo with which knowledge ages or decays, the greater the potential influence of those who manufacture or augment knowledge' (Stehr, 1992:114). With the diminished need to protect knowledge the information networks can be more open.

Knowledge in a dynamic system also needs less protection because it is not as reliable as knowledge in a static system. In a dynamic system, the interconnections of actions are changing and so are less definite. Interpretations do not have time to stabilize and there are more frequent incompatibilities of texts. Intuitive assessment of individual actors is more important than any codified knowledge.

Another reason for open access to information in a dynamic

system is that the design of a (closed) information network requires effort. When system relations are frequently changing this effort would have to be ongoing and this would be rather costly. Open information networks require little change when relations change.

4.3.3 Influence through Diffusion of Information

The fact that the system functions can be structured by means of software programs also makes open information networks more likely. When the system consisted exclusively of institutionalized relations, the capacity to develop the system function was mostly restricted to those controlling the media. There was little possibility to develop models of functions independently of actual institutions. Another characteristic was that the functions in different parts of the system, and thus different organizations, were relatively unique. Managers developed every aspect of the relations in their part of the organization. As a result there was little competition in developing system relations; managers did not try to 'sell' their solutions.

The possibility of developing the system function through software program to some degree separates the capacity to design system function, to write texts, from the control of the media. Designing relations in the form of software program requires relatively few resources and individuals do not need to be in position of control to be able to structure the system relations. This means that a larger number of 'system designers' can produce abstract structures representing new system relations. In

addition, rather than developing a solution for each application, the solutions are now standardized. These solutions can be bought off the shelf in the form of a software package. With more authors producing texts and a wider potential 'market' for solutions there is increased competition for a share of this market.

Having one's solution accepted has advantages. It can be sold for profit in some cases. More importantly, it means that the author (producer company) becomes the source of system knowledge and so has the best knowledge of this part of the system. By diffusing information one sets standards. As a result the system is being developed around the producer's knowledge resources and the rest of their knowledge becomes also more effective.

The chances of having one's solution accepted as a standard depend on how widely the software is known and implemented and on its demonstrated performance. The producers of software programs can improve their chances by 'advertising' their solutions. These solutions need to be easily accessible and advertised³⁰ if they are to gain visibility and become widely known. This means that instead of protecting information, as was the case in the industrial system, authors often diffuse it to gain influence and to improve their chances of general acceptance.

³⁰ One example is free software provided on the Web. Also, various kinds of information that used to be considered proprietary are now posted in the Web by many firms.

5. DOMINANT CLASS IN IT-BASED SYSTEM

This chapter works out the implications of the identified system changes for the constitution and reproduction of the dominant class. I start by analyzing the effect of IT on the institution that have been controlling money. This analysis shows that control of money is becoming separated from the structuring of the system and no longer determines the dominant class. Since there does not seem to be any steering medium that could be used by actors to structure the system I need to generalize my definition of a dominant class and the theorization of its power to include any method of structuring a system. Using this definition I analyze the how the membership of the dominant class in IT-based system is determined. Finally, I argue that this 'class' is not likely to develop a distinct culture and thus it is not a class in the full meaning of the definition.

5.1 Separation of Control of Money and Structuring of System

Considering my earlier conclusion that money retains its role as the dominant medium, the character of the dominant class in the emerging IT-based system can be determined by analyzing how the control of money is being changed. In the industrial system money was controlled mostly by large economic institutions like corporations and banks. The question is then in what way the identified changes of the system brought about by IT affect these institutions and thus the control of money. Manufacturing corporations as well as banks have been organized as bureaucracies centrally controlled by senior management. The control was

exercised partly through writing formal texts and partly through ad hoc decision. Actions of individual members of these organizations were determined by a combination of codified knowledge of the texts, cultural knowledge - including internalized texts and institutionalized norms - and by intuitive knowledge of individuals.

IT can perform a large part of the functions of bureaucratic organizations. Codified knowledge in the form of software programs stored and applied by IT can replace most of the knowledge that directed actions in the industrial economy. In manufacturing, IT and software programs make possible automated production as well as coordination of supporting functions and distribution of products. Banks and other financial institutions are also shifting from bureaucratic control to IT systems. Money is pure information, and a large part of the function of banks is to process this information with some formulas and variable parameters like interest rates, credit ratings etc.. Such functions are ideally suited to handle by IT and banks have been at the forefront of computerization³¹.

The fact that both manufacturing and banks are now increasingly controlled by IT means that most day-to-day operations can be executed just by codified knowledge, without any need of intuitive knowledge and people. This separates the system structures from human agency and the structuring of the system from the control of money.

³¹ For the sake of simplicity I will continued to use the term 'bank' even though there is a proliferation of various financial institutions.

The fact that the structures of the industrial system were constituted by people with institutional relations, together with bureaucratic control of economic institutions by senior management, meant that the industrial system could be structured through the control of money. Flows of money elicit desired actions from actors and, as they became regular, they established relations between them which in turn constituted social structures. Those supplying money (by directing flows of money) could set conditions for continuing the supply of; this allowed them to shape the structures. Investments made possible creation of private bureaucracies by providing the capital needed for salaries and also providing facilities, infrastructure etc.. The owners or majority share holders appointed the senior management, set objectives and determined the high level structure of the corporation. The management controlled the routine operations and more specific aspects of the structure. They wrote texts that structure the organizations by prescribing functions of individual parts and designing information flows and the interconnection of functions.

The connection of control of money and centralized control of bureaucratic organization meant that only the management of the bureaucracies could write texts and structure the system. The management positions not only established the prerogative to write texts but also prevented challenges to their decision by providing conditions for developing a monopoly of knowledge. Bureaucratic organizations supplied formal information and knowledge of the formal texts. They made possible control of information by

constituting information networks, determining flows of information, designing conceptual frameworks, determining issues and providing the context knowledge for the generation of information.

The fact that a large part of the knowledge was not codified made the capacity to write texts dependent on the practical experience of routine control. Part of the control through ad hoc decision in specific situations over time produced implicit texts which might even override the formal text. Writing of new texts as well as ad hoc control then required knowledge of the implicit texts of other parts of organizations as well as those of other organizations. Only the manager who knew the implicit texts from practical experience was able to structure the relations. The idiosyncratic nature of each organization (differences in people, relations with organizations, etc.) also meant that each manager could write texts only for the organization she was a part of. This meant that in the industrial system day-to-day operation of the institutions and structuring of the system through 'writing' of texts were intertwined and could not be separated. Dependence of knowledge on position means that in the industrial system control of money made possible the structuring the system and development of the subjective knowledge of the senior management as well as of the investors.

IT cannot be influenced by money which means the IT-based system cannot be structured by money. The nature and objectives of control of money in the form of investment are changed. The goal for investment is increasingly to find the best return with an

acceptable risk without consideration of the consequences for the system. The nature of investing is also changing because of an increased dynamism of the system and the capacity of IT to organize markets that can be easily monitored. The 'investment industry' is too competitive and investors as well as brokers have to focus exclusively on earned profits. Because of the dynamic nature of the system higher profits are achieved by short term investments, by moving money around. In the industrial economy banks had more reason to develop the sector of economy they invested in because it was not as easy to switch investments and the relation between banks and corporations was more stable. This was not only due to regulations and lack of competition, but also because there was less financing through stock markets and more direct investment which had to be made for extended and fixed terms. In an IT-based system the structures are also becoming too complex and dynamic for banks and investors to follow. With the frequent changes and fragmented (portfolio) investments being changed frequently investors have no time to become familiar with the specific conditions in each case in order to be able exercise a constructive influence³².

This does not mean that banks have no interest in structuring the economy. They have to develop an infrastructure that allows them to provide more competitive and flexible financial services necessary for generating profits. Banks and other financial

³² It can be expected that regulations will be put in place to reduce the mobility of investment capital to reduce speculation. It is not likely, however, to change the objective of investors.

institutions do structure the economy but it is not through the traditional banking functions but rather through providing structures that facilitate the movement of money and in the same time generate revenues.

5.2 Generalized Definition of Dominant Class

Since the control of money does not provide capacity to structure an IT-based system money cannot be seen as the dominant steering medium. The question is, then, what would replace money as the dominant medium? I considered money to be the dominant steering medium because the economy is generally recognized as the dominant subsystem and it is organized by money (private power is clearly subordinated to money). The economy in the IT-based system is integrated by information and, as I have argued, information can be viewed as a steering medium. Could information be the dominant medium even though it does not have any influence of its own and is anchored in lifeworld only through money (and power)? It is not really necessary to answer this question because there are other problems with using the medium of information to analyze class relations. No actors can control the medium of information in the way money and power can be controlled. The medium of information is required for the organization of the system including the market mechanism. Direct control of this information would paralyse the system function. It seems that in an IT-based system there is not any specific medium that would be a source of superior power.

In the absence of a dominant medium, I cannot determine the

membership of the dominant class using the definition of a dominant class as a group controlling the dominant medium. This problem can be overcome by revising the definition of dominant class. I have initially stated that a dominant class is distinguished by the capacity to control the system. I then used the control of the dominant medium to define the dominant class because it seemed easier to identify the class membership in this way, and because it was my assumption that the only way a system can be controlled is through some steering medium.

Control of system could mean control of people in the system or control of the structures (which determine the functional imperatives). In the industrial system, both these kinds of control were unified and exercised through the media. Now, the media no longer control the structures and the two kinds of control are separating. Which kind of control I need to focus on depends on the relevance of the control for the dominant class. What is ultimately important for the dominant class is that they shape (both influence and specify) functional imperatives and that they are important for the function of the system. This allows them to secure their power and also to ensure that their needs receive special attention because of the importance of their function in the system. Control the system structures satisfies both these conditions. It is a more general way to define the dominant class, control of a steering medium is only one way how this could be achieved.

An IT-based system is structured through design of IT, particularly development of software, but also of hardware and

infrastructure. The power of actors is based in the capacity to generate imperatives that need to be accommodated but cannot be critically assessed by others. The influence of the system imperatives flows from the system's capacity to produce commodities and their distribution through market organized by means of the medium of information. The capacity to shape imperatives also allows this class to direct the attention of society regardless of what means (which steering medium) are used to satisfy the imperatives.

5.3 Constitution of New Dominant Class

Now, I will examine more closely the dominant class in an IT-based system. The functional definition introduced above allows me to determine the membership of the dominant class. There are two considerations in determining the dominant class' membership that need to be discussed. One is the specific nature of the structuring of the system and the knowledge required. This is related to the nature of the system and I will address it by discussing how the model of an IT-based system differs from the model of the industrial system elaborated earlier. The second consideration is the way in which the process of structuring is organized.

To be able to structure a system, individuals need to be sufficiently familiar with the existing knowledge constituting the system. Various kinds of objective knowledge constituting a system form a hierarchy and the group most familiar with the knowledge at the top of the hierarchy can best accommodate functional

imperatives, and thus has the prerogative to structure the system. The functional imperatives this group generates/ specifies have the highest priority. What determines the position of a 'piece' of knowledge in this hierarchy is the importance of this knowledge for the function of the system, how difficult it is to replace this knowledge. The model of the industrial system I have developed consisted of three kinds of knowledge. The cultural and intuitive knowledge of the senior management was at the top of the hierarchy. This knowledge made possible system-wide integration of actions and generated the highest level imperatives. Next came integrated blocks of codified knowledge in the form of explicit texts. At the bottom of the hierarchy was the intuitive knowledge of regular members of bureaucratic organizations which had to accommodate the imperatives generated by the two other kinds of knowledge.

In an IT-based system, there is little need of intuitive knowledge for routine function and integration of the system. The codified knowledge in the form of IT (software, infrastructure) is integrated system wide and it is at the top of the hierarchy and generates the highest level imperatives. This means that those with the best understanding of the existing codified knowledge are in the best position to develop the system function. At the bottom is intuitive knowledge located at the periphery of the system which interprets between the system and its environment. People and institutions are moving to the periphery of the system and have to adapt to the IT structure constituting the core of the system. The intuitive knowledge needed to structure the system is

not required for routine system functioning. The organizations structuring the system are more fluid and do not seem to form any lasting structures. In a way, they are not a part of the system; they monitor and structure it from outside³³. This means that they are not a source of any functional imperatives³⁴.

Since an IT-based system is structured by producing codified knowledge, the way in which this function is organized will also affect the character of the dominant class. Depending on its complexity, codified knowledge can be produced by individuals or organizations. The industrial system could be structured by individuals or small numbers of senior managers. The IT-based system, however, is more complex and more dynamic. Since an IT-based system mostly functions independently of people, individuals cannot have an understanding of it from their routine function as a part of the system, as was the case with managers in the industrial system. Perfect matching of various parts of codified knowledge is necessary because there are no interpretations to absorb incompatibilities between them. This means that various codified knowledge integrating an IT-based system is too complex for individuals and needs to be produced by organizations. No single person can hold all the knowledge that is required to

³³ These organizations do, of course, remain part of the system in the sense that they interact through the market with other actors. They are not, however, necessary for the routine functioning of the system.

³⁴ They generate imperatives by producing codified knowledge and by presenting the imperatives of the existing structures, not by any structure of their organization.

... and make together large blocks of codified knowledge. ... as well as make possible the accumulation and reproduction of ... knowledge. They achieve compatibility of the ... conversations between individual members.

As I have discussed, information production is different from manufacturing and cannot be effectively organized on bureaucratic principles. The dominant class cannot be seen simply as controlled by senior management because they have only limited control over the information produced. The structuring of the system needs to be organized by mutual adjustment which means the organization needs to be less formal and more flexible so that individuals can exercise their initiative and develop their relations with the rest of organization as required.

Since neither actions nor relations can be effectively prescribed, there is only limited use for texts. Information production is directed only by intuitive knowledge and action interconnection is through conversations rather than by flows of formal information. Because these conversations are not directed by any texts, they can be seen as master conversations. All members of the organization exercise control and generate imperatives that are not transparent to the management. Each has to find what are the requirements of other parts and decide how to accommodate them. The control exercised by individuals depends on their knowledge of the existing system (relevant for the production of new knowledge). The better an individual understands the codified knowledge of the system, the more imperatives she can identify and the better she can support the proposed solutions. In

addition, participation in conversations is determined by knowledge rather than by the formal position of individuals. Rather than as a hierarchy of positions, information-producing organization can be seen as a hierarchy of conversations in which participation is determined on the basis of knowledge (Taylor and Van Every, 1992:215). The position of conversations in the hierarchy depends on the position of the codified knowledge being produced.

In bureaucracy the influence of individuals also depended on their knowledge but only in an indirect way. This relation was more fixed, and the knowledge was assessed in a more formal way. The development of knowledge was affected by restricted access to information and cultural knowledge. In an information-producing organization, it can be recognized that the hierarchy of knowledge depends on the subject matter, i.e. different people have different areas of expertise. In addition, the selection of the participants does not need to be formally justified as in the case of promotions, a 'gut feeling' is sufficient. The above discussion offers guidance for determining the composition of the dominant class. The system is structured through the production of information. To view all those involved in information production as a dominant class, however, is not appropriate. Although they all have a degree of influence, the differences within this group are exceedingly large. It is possible to narrow down the dominant class membership if we consider that, while the codified knowledge that is at the top of the hierarchy in an IT-based system, there are many kinds of codified knowledge in IT-based system and they

also form a hierarchy. Knowing what kinds of knowledge are at the top of the hierarchy enables us to identify the information producing-organizations with the most influence. I also need to be able to identify the individuals with the best knowledge, and thus most influence within these organizations.

The hierarchy of codified knowledge is not absolute or objective and it changes continuously as new codified knowledge is incorporated into the system. Because of the difficulties of analyzing the hierarchy of the system knowledge, I will limit myself to discussion of what determines the hierarchy with an example of some high influence codified knowledge in the existing system.

In a codified system, all new codified knowledge either has to be fully compatible with the existing system knowledge, or it has to replace the incompatible existing knowledge. The more difficult the knowledge is to replace, the more influence it has and the higher it is located in the hierarchy. What determines how difficult it is to replace a knowledge is its complexity and the scale of integration it provides. A large the scale of integration means that the linked pieces of knowledge would also need to be considered and accommodated if the integrating knowledge were to be replaced. This points to another factor to be considered; the complexity of the interface of the integrating knowledge. When the link between different pieces of knowledge is limited to few parameters, it is easy to replace on of them. The influence of specific knowledge also depends on how important it is for the system function, how large a part of the lifeworld needs depends

on it. A complex knowledge providing small function can be dropped from the system when priorities change.

The above discussion indicates that quite different kinds of knowledge may have a high degree of influence. Their influence may be, however, of varied permanency. The system integrating knowledge has more lasting influence because it is not affected by change of priorities, it cannot be dropped. Telecommunication and computer technology are perhaps best examples of integrating knowledge in the system and is located at the top of the hierarchy. Its influence is more lasting though it depends on the existence of competing technologies on their installed base. The other case is knowledge representing 'digitized' reality or technological processes may be also important for the function of the system but has fewer links to other pieces of knowledge and thus is easier to accomodate or replace. This kind of knowledge also loses influence if lifeworld priorities changes.

The second part of determining the constitution of the dominant class is how to identify the most influential individuals in the organization. The most knowledgeable individuals, those with most influence on the direction of development still do move to the 'executive' positions. What is different from the industrial system is that, due to the lack of mechanisms securing a monopoly of knowledge, their positions are not secured and change is more frequent in these positions. Another indication of influence of individuals within organization is their salary. The knowledge acquired by individuals in an information-producing organization depends on their talent and industriousness.

The influence generated by production of codified knowledge can be seen as producing a new kind of capital, knowledge capital. This capital is determined by intuitive knowledge that has capacity to improve the system function. It is developed in the process of developing the system and is dependent on acceptance of the solutions developed, on the installed base of their 'products'. Those who have their solutions accepted increase their knowledge capital because their knowledge becomes connected to the existing system. A knowledge capital allows those who control it to specify imperative and develop solutions that are accepted. It can be developed with financial capital but cannot be controlled by it.

5.4 Culture and Reproduction of Dominant Class

A class, as I have defined it, is not determined just functionally, by the function or position of its members. The second aspect of the concept of a class is a common culture. A common culture is an important factor in determining class interests and class consciousness which are required for cooperation to secure the position of the class. In the case of a dominant class, such cooperation is necessary to ensure the continued existence of the class. In my theorization, common and exclusive culture is the key component in the mechanism that reproduces dominant class. The changed function of the dominant class will likely make their culture less exclusive and arbitrary and this would affect its capacity to reproduce itself.

For a functionally determined group to develop a common and exclusive culture, its membership needs to be sufficiently stable and individual members have to interact on a regular basis in practices of communicative actions. Participation in these actions also needs to be exclusive in order to produce an exclusive culture. In the case of the new 'dominant class'³⁵ neither of the two conditions is really satisfied. The participation in master conversations that coordinated the structuring of the system can vary on the basis of knowledge which means that a relatively large part of society participates in these conversations. This will make the culture within the organizations producing codified knowledge relatively homogenous. There is also a considerable movement of people between different information producing organizations. The movement is made possible by overlap of knowledge required in different areas of the system as many kinds of IT like infrastructure, tools, etc. are used across the system and result in standardization of knowledge. On the other hand the participation in the structuring the system and master conversations is still limited to the members of organizations producing high level codified knowledge. The section of society not participating in the production of information is excluded from this culture.

There will also likely be less homogenization of any exclusive culture of the dominant class on the system wide scale

³⁵ I continue using the term dominant class even though, as I will discuss later, this 'class' does not really comply with the definition of class.

because of diminished need for personal interaction. To be able to develop the system's function the actors involved need to have knowledge of the performance of the existing system. In the industrial system social circles of the dominant class were important source of knowledge for individual members. Because of a limited codification of the system and fragmentation of information networks it was not possible to monitor the system just by means of formal information channels. As the system integration is increasingly through formal information distributed through IT networks the system can be monitored by means of this information alone. It provides actors with more up to date, comprehensive and accurate knowledge of the system's performance than social contacts. This means that individuals are less dependent on social contacts for the knowledge of the system's state and functioning. As the importance of social contacts for monitoring and structuring system diminishes there is less reason to maintain them. Fewer social contacts result in a diminished dominant lifeworld with less homogenization of exclusive cultural knowledge. The cultural distance within the class are large relative to the distance across various groups producing information. Separation of social relations from the system will also likely affect diffusion of this culture to 'non-functional' members of the dominant class, i.e. the family members.

As a direct importance of the dominant class culture for development of the system declines, the knowledge of the codified system structures can be expected to increase in importance. The dominant culture also plays a role in helping individuals with

acquiring this knowledge by providing effective cognitive tools. The cognitive tools of the dominant class have been effective because they were developed over time together with the system. Now, the nature of the system is changing. Codified knowledge in the form of software programs residing in IT is replacing printed texts and internalized codified knowledge. Since networking is 'challenging the viability of existing industrial structures, organizational norms, and rules of conduct' (Mansell, 1996:35) the remaining institutions will have to change to accommodate this new reality. As the nature of the system changes the existing culture of the dominant class including the cognitive tools can be expected to gradually lose its effectiveness. This means that the advantage of the existing dominant class, will be diminishing and there will be a considerable change in the membership of this class.

The questions is then whether the new group controlling the system can stabilize and form a class. This would require that they develop new cognitive tools (appropriate for the changed system) that would become a part of their culture and provide enough advantage to reproduces the class. That the dominant class culture is not exclusive and homogenized makes it unlikely. There are also reasons to believe that the development of any exclusive and effective class culture will not keep up with the more dynamic IT-based system. The groups that cooperate in codifying the system function have to develop some culture through the conversations as they structure the system. This culture is developing along with the system, with the technology and codified knowledge. For

culture to become effective for class reproduction, however, it needs to be homogenized across the class including its 'non-functional' members, i.e. family members. This takes time and it also requires that all class members participate in the conversations at least as observers. The system has always been changing but the rate and nature of the change was less dramatic. In addition, as I have discussed, the system function is becoming independent of social interactions. The faster change of the system and diminished social contacts (separated from system function) make an effective class culture unlikely.

The culture of the groups structuring an IT-based system is also less arbitrary and so more accessible to outsiders. In the industrial system the subject of master conversations was mostly rather nebulous. Various relations and interactions between people and implicit texts could be conceptualized in different ways. They put little restrictions on the culture reproduced through the conversations. As a result the culture was quite arbitrary and inaccessible to rest of society. As the system is increasingly formed by explicit codified structures the subject of conversations is more objective which means that the conceptualizations are determined by these texts. This puts objective restrictions on the culture of the dominant class and makes it less arbitrary. The culture has to accommodate the imperatives of this large scale, even globally, integrated codified knowledge which offers little flexibility and cannot be changed easily. Less arbitrary culture is more accessible to outsiders when 'read' in connection with the codified system

knowledge. They can assimilate to the culture in relatively short time 'on the job'.

5.5 Conclusions, Meritocratic Society

My analysis indicates that in an IT-based system, there is not likely to be any distinct dominant class as I have defined it. There are some problems with specifying the class functionally and, more importantly, there is no group with distinct common culture.

We may still identify a functional group within the system that has dominant influence and could be considered as a functionally-defined dominant class. It consists mostly of the executives of the organizations producing the codified knowledge integrating the system. This group is, however, less stable. Its members have a high level of 'technical' knowledge and have to compete for their positions. Their influence is not dependent on specific positions; they can move to other, perhaps more powerful, organizations if their knowledge warrants it. In the industrial system, influences were more differentiated and determined exclusively by formal positions within corporate bureaucracies. The volume of the flows of money controlled also can be determined more clearly than the position of the knowledge produced in the system hierarchy.

The cultural part of the definition makes the division between the dominant class and the rest of the society more problematic. It can be said that there is not really a culturally distinct dominant class. Since there is no distinct culture, that

part of society with the most influence does not in essence constitute a class and cannot reproduce itself across generations. Without any effective reproduction of this group, competition for the control of the system becomes more open, making the society more meritocratic. While meritocratic society may offer some advantages, it is not without problems. It does not, by itself, provide any limits to the stratification of power. Another negative aspect of meritocratic society is that, due to its more competitive nature, it tends to concentrate on the short-term aspects of the system function which means that longer-term considerations, including lifeworld imperatives, tend to be neglected.

Without some effective mechanism to limit stratification, society is not likely to remain meritocratic for long. When the differences grow sufficiently large, they inevitably provide some advantages for the offspring of the more successful groups. These advantages may include more access to technology, private lessons as well as more stimulating environment and higher confidence levels. The members of these groups are also bound to share an interest in passing some of their privileges to their offspring and cooperate towards this end. There are mechanisms other than culture which can reproduce dominant class. One possibility is through economically differentiated education. More expensive private school could provide higher level of knowledge of the system and of tools for its structuring.

While the group controlling the system may be less distinct, there is a more clearly defined and growing marginalized section

of society. People lacking the necessary mental capacity and knowledge to participate in information production have to compete for work in the service sector or disappearing manual work. They are likely to have little political influence because they are not able to critically assess the functional imperatives. In addition they may be excluded from the culture of the influential part of society. This would mean that this group would be reproduced as the lower class.

The results of my analysis agree with an apparent shift towards a more meritocratic society presently under way. It provides a possible explanation of the present trend. If I am correct, this trend is not a mere temporary phenomenon caused by adaptation of the system to the changing conditions that would disappear when the system adjusts (as happened after the industrial revolution). Neither is it likely, however, to last a long time because a new mechanism of dominant class reproduction is likely to develop.

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