Complexities of Flexible Labor
Dimensions and Consequences

Genehmigte Dissertation

zur Erlangung eines Grades des Doctor rerum politicarum
im Fachbereich Gesellschafts- und Geschichtswissenschaften
an der Technischen Universität Darmstadt

Referenten

Prof. Dr. Rudi Schmiede
Assistant Prof. Chris Benner PhD
Prof. Dr. Beate Krais

vorgelegt von

Diplom-Volkswirtin Tina Klug
geboren in Frankfurt am Main

Tag der Einreichung: 13. November 2006
Tag der mündlichen Prüfung: 01. Februar 2007

D17

Darmstadt 2007

Acknowledgement

This dissertation was developed at the Technology and Society Graduate School of the Darmstadt University of Technology and was funded by the German Research Foundation (DFG). Many thanks to Rudi Schmiede who supported this study from the very beginning. My special thanks to Chris Benner, who gave me the opportunity to spend time as a researching scholar at the Pennsylvania State University. He inspired my work in many intense discussions. Also, thanks to Beate Krais for her thorough evaluation of my dissertation.

The graduate school community – teachers and PhD students – was very supportive for this work. Without intending to diminish the impact of the others, Lars Frers, Christian Kehrt and Dominique Gillebeert deserve special thanks. They often found the right words to support the development of my dissertation and enriched my life beyond this project. Outside the graduate school, Brita Hohlmann from the knowledge working group in Darmstadt was continuously supportive, academically and privately.

This dissertation would not exist without the encouragement of my family and friends. Some of my friends might not realize their support, yet the opportunity for some distraction outside the academic world did me a lot of good.

Certainly, my family experienced most of the ups and downs of this dissertation. Thanks to my parents, Margrit and Klaus Klug, who did everything right providing me with the necessary ambition and self-confidence to start and end this kind of project. Thanks to my little brother Tim Klug for his confidence and his liveliness. Thanks to my American family Marian and Rachel Wiseman and Tom Eichenberger. Marian's support was the most work-intensive. Besides her enriching company, she was responsible for editing this book. Thus, I remain in her debt. Thanks to my stepdaughters Melina and Malu Krapp who patiently put up with my moods and absenteeism.

More thanks than I can express goes to my twin sister Heide Klug, for both her professional and mental support, and to my partner Carsten Herbert, who proved to have at least as much stamina as I had.

Tina Klug

Darmstadt, July 2007

Contents

Figures

Tables

Introduction

This study deals with the broad restructuring of the labor process that has been developing for several decades and is ongoing in today's economy. This restructuring includes general trends in the labor market, including those in employment, employment relationships, employment regulation, and employment contracts. Other structural changes of the labor process involve work tasks, work conditions, and workers' representation. An important dimension in considering all of these changes is how they affect the individual employee subjectively. All of these changes within labor are important for and are included in this study, which takes an all-encompassing view to reach a broad understanding of the labor process and the implications of its ongoing restructuring.

The concept of informational capitalism provides the theoretical background of this study. The concept was introduced by Castells (1996) to explain the economic trends during the last three decades. With his approach, Castells emphasizes the new role of information and communication and their related technologies for economic restructuring.[1] The labor process is an important part of his analysis. Using the framework of informational capitalism, I try to understand the diverse aspects of flexibility within the labor process, and the consequences of flexibility for workers, employers, and the labor market.

My objective for researching flexible labor in informational capitalism is to question the widespread opinion that labor needs to develop into being increasingly flexible and that this is important in order to be competitive in the globalized market. For example, Serge Dassault, the chairman of the Dassault Aviation, stated in 1998 that "[i]t is not fashionable to talk about flexibility, and yet this is an answer to all our problems" (Standing 1999).[2] Opponents of this view are generally critical about the increasing power of the international market and fear declining labor conditions and problematic effects for workers when the call for flexibility prevails (see representative Sennett 1998). There are widely different views about whether labor today is too flexible or not flexible enough. An editorialist in the neoliberal economic newspaper *Handelsblatt*, for example, recently stated that the flexible employee is a myth in

[1] In chapter 1 I will show that Castells approach of informational capitalism is one of various current approaches addressing the restructuring of economy focusing on the important role of information and communication and their related technology.

[2] Quoted by Standing (1999) as introduction to the second part of his book called "The Sirens of Flexibility."

Germany (Gillmann 2006). She referred to empirical studies by the German Institute for Employment Research and the Federal Institute for Vocational Education and Training, which present data about the mobility of German workers, the frequency of changes of occupations, and the willingness of employees to participate in training. All three aspects are lower than widely believed and even declined during the last century. But these indicators, used to represent the flexible employee or flexible labor in general by the *Handelsblatt,* are in fact only a fraction of what constitutes flexible labor today. Like the opinion expressed in the *Handelsblatt*, many views about labor flexibility do not take into account the complex dimensions that affect flexibility. The goal of this study is to provide a broader understanding of flexibility and its effects on workers, employers and the labor market.

In my research of the restructuring of the labor process in informational capitalism, I chose two countries for my analysis which are different representatives of informational capitalism: the United States and Germany. The United States represents a highly deregulated supply-oriented market economy with a fairly flexible work force, whereas Germany represents a highly regulated social market economy with a rather inflexible workforce.[3] Thus, although both countries epitomize informational capitalism, they have fairly distinct institutional, regulatory, and political environments regarding the role of labor and the labor market. Analyzing trends given these different premises should be valuable for identifying important influences. Similar trends in both countries reflect global and nationally independent trends, whereas distinct developments show that there are still national differences in a globalized economy.

Overall, the underlying goal of this study is to give an understanding to the complex trends in the current restructuring of the labor process. Understanding these developments may help to prevent negative outcomes and encourages beneficial effects. The scope of this study can be described as follows: The dimensions and consequences of changes in the labor process are discussed broadly and are viewed within the perspective of overall economic restructuring, referring to US and German developments and using Anglo-American and German academic discussions to support the argumentation.

The specific role of information and communication technology (ICT) in informational capitalism led to the idea to concentrate on software developers and the

[3] I consciously choose the term “represent” to indicate that this statement is somewhat stereotypical and does not represent the complexity of reality.

information technology (IT) industry when analyzing the labor process. Also, IT employment can be considered as an early indicator of new forms of employment (Dostal 2006). The processes experienced in the IT industry and by software developers are very likely to develop in other industries and occupations as technology becomes more important in other industries. In addition to this theoretical reason for focusing on software developers and the IT industry, I had the pragmatic need to narrow down the huge field of labor. However, in concentrating on software developers and the IT industry I have not excluded other industries and occupations, which have provided a great deal of data and trends that are helpful in my analyses.

Methodologically I have followed Benner's approach of the SWET analysis (Benner 2006). SWET stands for four interrelated dimensions of the labor process. These dimensions are space, work, employment and time. The SWET analysis is a useful framework to analyze changes in the labor process focusing on ICT. With the SWET analysis, developments of the labor process are theoretically described, and these descriptions are supported by quantitative and qualitative empirical information. It can therefore be understood as an open methodological approach that favors a mix of methods. Where quantitative data exists, it is used to support theoretical arguments. For aspects that are not analyzed using quantitative data, qualitative empirical data is consulted to support theoretical statements. In addition to consulting other qualitative studies, I interviewed software developers myself. The stories of my interview partners are incorporated into my analysis and illustrate the restructuring of the labor process from a personal and current perspective. These perspectives help to convey ideas about the intangible aspects of employees' lives and the work situation of software developers.

My underlying research question is how flexible labor can be characterized so that all of its dimensions in informational capitalism are being taken into account. The four dimensions of the labor process provide a helpful framework in analyzing the changes in the labor process, especially for focusing on the impact of information and communication technology (ICT).

My study initially deals with changes in the labor process within economic and social frameworks. Labor has an enormous impact on people's lives and looking at labor therefore explains much of the general social and economic changes. I will focus specifically on aspects of labor flexibility. Today, flexibility is one of the most important characteristics of changes in the labor process. The term flexibility, however,

is relatively unclear, undefined, and is a highly value-laden concept. I define labor flexibility as both the qualitative and quantitative adoption to change in the dimensions of space, work, employment and time that have positive as well as negative effects on the involved actors and that occurs in a relatively short time frame and with relatively low costs.

As stated above the underlying foundation of this study is the theoretical approach to "informational capitalism" and how the relationship between technology and society is understood within these recent theories. I do not subscribe to a deterministic approach, which would see technology itself as being responsible for changes. Instead, I follow the view that *how* the technology is *applied and used* influences changes in work and employment processes.

Part I (chapters 1 to 3) addresses the background and the framework of this study. Part II (chapters 4 to 7) provides the empirical and theoretical analysis of the restructuring of the labor process, using the SWET approach introduced above.

Chapter 1 starts with presenting the empirical and theoretical background of the socioeconomic development from the 1970s until present, taking into account economic, organizational, institutional, and individual developments. Chapter 2 develops an understanding of flexible labor and the role of ICT in recent developments. Chapter 3 presents empirical background information about the US and German labor and economic situations.

Chapter 4 addresses the changes within the labor process regarding space. Trends in global spatial labor, networks, and office space all play a role in the analysis of these changes. Chapter 5 examines changes within work, considering the role of education, training, skills, knowledge, communication, and the market. Employment is the topic analyzed in chapter 6. Employment relations, institutional responses to changing needs and supply of employee qualifications, and management practices are discussed in this part of the study. The last chapter 7 looks at time. There, I distinguish between the individual and the economic dimension of time within the labor process.

Analyzing the four dimensions space, work, employment, and time provides a comprehensive picture of the labor process that helps to understand current changes. Concluding, I summarize the main results of the study and offer some suggestions for future research.

Part I

1 Socio-economic Development, 1970s - Present

Broad social and economic developments form the basis of the following analysis of flexible labor in informational capitalism. This chapter will focus on the economic restructuring associated with the rise of an information economy since the 1970s, briefly describing economical, organizational, institutional, and subjective dimensions of the changes within the last thirty-five years. Before turning to the analysis I am going to discuss the latest theoretical and empirical approaches to economic and societal changes associated with the rise of an information economy.

When discussing the recent developments and theoretical approaches behind them, I differentiate between four separate levels: First, the economic structures that were undergoing major changes during the last thirty-five years; second, changes on the organizational level; third, changes within institutional settings; and fourth, developments that affect the individuals on a subjective or individual level. Understanding developments on this fourth level will help to range the later findings within a broader social context.

1.1 Economic Development

A number of theoretical approaches have been used to explain the economic developments that led to increasing flexibility of economic structures during the last three decades. Following the theoretical approach dealing with the inflexible era of Fordism, several different theories tried to explain the subsequent developments: Post-Fordism, postindustrial society, flexible accumulation, digital capitalism, high tech capitalism, and informational capitalism. My research will focus on latter approaches because the explanation of the role of information and communication technology (ICT) for economic restructuring brought forward in these theories is most convincing.

The economic situation at the beginning of the 1970s, which constitutes the end of the period of *Fordism*, is the initial point of reference of this study. Therefore, the time period of Fordism is an important background for this study. The relatively inflexible Fordist economic production principle was the backdrop for the discourse by other theorists about the increasing flexibility of labor. Fordism is a term that applies to the capitalist system that was based on mass production and mass consumption in the

first half of the 20th century.[4] Antonio Gramsci, who coined the term Fordism, and Michel Aglietta are the most prominent theorists who analyzed economic systems of that time period (Gramsci 1999, Aglietta 2001 [1979], Hübner 1989). Gramsci explained the Fordist system as a gradual dynamic concept that made up for a missed modernization. The basic principle was that a new mode of allocation and accumulation led to a rationalization of the population.

Aglietta introduced the regulation school as a theoretical approach to analyze the era of Fordism. Researchers used that approach to try to explain how the capitalist system could be stable within the era of Fordism. This approach can be described as a nonlinear theory of the capitalist development and therefore differs from Gramsci's approach. It accentuates the crises within the capitalist system and how a specific mode of regulation dealt with these capitalist crises (Tanner 1999, 582ff.). Important arguments of the regulation school correspond to the central thesis of Karl Polanyi. In his analysis, Polanyi put forward the notion that the capitalist system has self destructing characteristics, because of its necessary limitations of political planning, regulation and control of the economy. (Polanyi 1978, Hübner and Mahnkopf 1988, Kühl 2004). The regulation school approach focused on the technological innovations that caused the leap in production (Hübner 1989, 19). Most important in that context was the recognition of the embeddedness of technological developments in social and political frameworks.

> „To these thinkers it is unacceptable to centre, say, solely on technological innovations in the workplace or the home as a means of understanding change. It is not that these are ignored, but rather that technological developments must be contextualized among several connected elements such as the state's role, class compositions, corporate trends, consumption patterns, changed gender relations and other features of a functioning system" (Webster 2002, 62).

When considering the informational restructuring of economy and society, I also use structural frameworks because these are important for realizing how the labor processes[5] changed within informational capitalism.

The characteristics of the Fordist epoch described above started dissolving after the so called "oil crisis" of the early 1970s. Several different approaches deal with

[4] On the one hand, the theoretical approach of Fordism stands for an economic era explaining the economic principles and coherences during the 20th century (cp. Gramsci 1999, Aglietta 2001 [1979]). On the other hand, Fordism is an organizational principle that was introduced by the company owner Henry Ford and that was probably inspired by the organizational principle of the scientific management (see for more details chapter 1.2) (Kieser 2002).

[5] In this study "labor process" is used as the umbrella term for work as well as employment processes. Flexible labor process thus includes flexible aspects of work as well as employment.

theoretical explanations of the economic developments following the Fordist era. The economic restructuring of the last three decades is often delineated within the broad concept of globalization. Basically, this globalization refers to the developments that have a major impact on economy, society, and people. At first, global financial markets increased in importance. Then the increasing competition among transnational companies on the worldwide markets had tremendous impact on the developments of these markets. One tangible development beyond these global trends is the increasing influence of modern ICT on the production process and management system. This allowed more flexible production, which in turn led to higher productivity in many areas of production. However, the interpretations of these empirical developments differ. Before I turn to the approach of informational capitalism, which my study is based on, I will try to delineate the differences between the theories of Post-Fordism, postindustrial society, and flexible accumulation. One prominent theoretical approach of the era following Fordism is called *Post-Fordism* (for review see e. g. Hübner 1989, Hirsch and Roth 1986). Theorists who represent Post-Fordism emanate from the need to explain the end of mass production. Yet, they do not necessarily agree on what emerged to replace mass production. They address automation, flexible specialization, new concepts of production, and high-tech production methods (Tanner 1999).

At the same time economic theories of Post-Fordism, theories about a postindustrial society were developed. Daniel Bell was the pioneer among post-industrial theorists who favored the idea of an era of post-industrial society. On the one hand, Bell promoted a transition from industrial production to a more important service sector. On the other hand he pointed to the central role of theoretical knowledge in the postindustrial area (Bell 1976 [1973]). His study of the postindustrial society was accepted and enhanced by many other researchers in social science. Later, Bell built on his approach of the postindustrial society, introducing a theory of the information society (Bell 1980). Both approaches, though, need to be viewed critically because, as Steinblicker has noted, they are not conceptually consistent (Steinbicker 2001, 111ff.). Bell's theoretical input is valuable and helpful, but his presentation of central aspects, such as the transformation from production to service industry and the central role of knowledge, are deficient (Steinbicker 2001, 70ff.).

One important point of criticism of Bell's approaches is that the Fordist way of production continues to be a characteristic of the current production system. Castells, for example, emphasizes in his study of the network society the continuous importance

of manufacturing and production of goods. Researchers who favor the view of Post-Fordism often overemphasize the increasing importance of the service sector and the decline in manufacturing. It is important to keep in mind, though, that services related to supply and distribution are closely connected with the production industry. One of the major criticisms of Bell's approach is that it is focused on the US economy, neglecting aspects of economy in other developed countries, not to mention different situations in underdeveloped countries.

In his analysis about the conditions of post-modernity David Harvey developed a different approach in which he more narrowly described the development of Post-Fordism. He hesitated to refer to the development of a new regime of accumulation and a new mode of regulation since 1973. Instead, he described the new developments as a "'flexible' regime of accumulation" (Harvey 1990, 124).

> "Flexible accumulation, as I shall tentatively call it, is marked by a direct confrontation with the rigidities of Fordism. It rests on flexibility with respect to labour processes, labour markets, products, and patterns of consumption. It is characterized by the emergence of entirely new sectors of production, new ways of providing financial services, new markets, and, above all, greatly intensified rates of commercial, technological, and organizational innovations" (Harvey 1990, 147).

Sixteen years later, referring to a flexible regime of accumulation is warranted, because indeed increasing flexibility is a major characteristic of the developments. Yet, in his analysis Harvey focused too much on the increasing service employment, neglecting the fact that this is especially important in the United States but not in other countries. Also, his focus on the increasing service employment peculates the remaining importance of production in his analysis.

Alternative approaches to the Post-Fordist perspective concentrate on the impact of ICT on societies and economies. Most prominent is the "information technology revolution" (Manuel Castells) or information revolution which will be discussed later in this chapter. Dan Schiller and Wolfgang Fritz Haug also concentrate on technology when considering the restructuring of economy and the labor processes.

Dan Schiller, for example, speaks of "digital capitalism" when analyzing modern developments. He highlights the importance of ICT in economic restructuring especially regarding use of the Internet. He states that knowledge that is generated via the Internet is as much socially shaped as knowledge that is spread outside the Internet. Focusing on the role of democracy, power, and social inequality Schiller concludes that the Internet is not – as widely believed – an expression of increasing democratic

structures, but to the contrary incorporates capitalist market mechanisms that are important for rearranging power and control structures in modern economy (Schiller 2000). Concerning the labor market Schiller argues:

> "Across a correspondingly lengthening range of productive and distributive activities, the reorganization of capital thus initiated a reciprocal reorganization of labor. Networked business processes substantially increased management's ability to disperse both the object and the subject of labor – jobs and workers – so as to maximize profits. The array of labor processes, and the types of job categories, that could be reconstituted around networked production changes burst through prior constraints. Transnationally networked production thus harbored profound consequences for global labor markets and for the worldwide division of labor" (Schiller 2000, 42).

Taking into account modern developments, Schiller assumes an intensive reorganization of labor which in sum is based on changes of network production.

Wolfgang Fritz Haug focuses on the high-tech productive forces in his analysis about the modern capitalism (Haug 2003). Because these productive forces have the most important influence on economic restructuring, Haug talks about "high tech capitalism" ("High-Tech-Kapitalismus"). He bases his analysis on Marxist theoretical approaches, pointing out the relevance of Marx's approach, even in light of modern ICT such as the Internet. Haug's major arguments are distinct from other modern analyses of capitalism such as Castells' approach and his emphasis on forces of the financial market or the talk about flexible capitalism, because Haug views flexibility only as the consequence not as the cause of changes. Hence, his approach is consistent with others in its granting the modern technologies a major role in the process of restructuring.

The theoretical approaches try to explain modern developments focusing on the role of technology and viewing recent changes as more or less revolutionary. With the talk about a revolution researchers emphasize the importance and momentousness of recent changes, judging them equally important to economic and societal changes that occurred during the second Industrial Revolution.[6] In the theories introduced, the role of knowledge and information and the development of ICT take center stage. Castells emphasizes a very important aspect in that discussion, when he states that it is not the centrality of knowledge and information that is new – because for economic progress

[6] Commonly known is only one Industrial Revolution. Theoreticians, however, distinguish between the first and second Industrial Revolution. The former developed in the middle of the 19th century and lasted until about the end of the 19th century. Here, the maximizing of profits through extension of the work day and reduction in income, takes the center stage. The latter describes the phase in which mass production developed as the central strategy – the time of high investments in production technology. Theorists of the regulation school refer to these phases as the "extensive accumulation strategy" and as the "intensive accumulation strategy" (Kühl 2004).

this has always been important – but in his view what is new today is the application of knowledge and information to produce new knowledge, and the ability to generate synergistic effects on the basis of knowledge and information (Castells 1996, 32, 58). Information processing and communication are the core of the "information technology revolution" (Castells 1996, 31).

All approaches use the era of Fordism as a point of reference. But Castells shows that the common explanations of rapid technological development do not result from the economic crisis of the 1970s. Castells demonstrates that although both the economic crisis and the rapid technological development occurred at the same time, that was only a "historical coincidence." He contends that the economic crisis and the rise of the "information technology revolution" were two independent processes (Castells 1996, 51). If the "information technology revolution" had been a response to the economic crisis, and therefore a "technological fix," he argues, the processes would not have occurred as closely together in time as they did. Generally speaking, a "technological fix" is not an immediate answer to economic developments, but a process that helps the economy to stay competitive over time (Castells 1996, 51).

Castells points out that the "information technology revolution" was technologically induced and not socially determined, but – and this is important – once the "information technology revolution" began, it was shaped by its historical context and therefore its development was socially and not technologically determined (Castells 1996, 52). I think it is critical to keep in mind that the "information technology revolution" is socially shaped, and, in Castells words, influenced by institutional, economic, and cultural factors (Castells 1996, 52). Only when people adopt new technologies can these technologies shape society and economy.

Excursus: Defying Technological Determinism

Writing about a relationship between a social condition (here: flexible labor) and a technology (here: ICT) often comes along with an endangerment of being misunderstood of possibly arguing technological deterministic. To make absolutely clear that a technological deterministic approach is not my intention I will try to clarify what stands behind my writings when using the terms relationship, influence, impact etc. in regard to technological development. A good summary concerning the relationship of work and ICT was given by Carnoy who studied the transformation in work, family, and community in the information age. He writes:

> "Technology is important, and the new information and communications technologies have had a tremendous impact on work. However, because technology is created by human minds, it has little meaning unless used by human workers and is employed in organizations run by people. These organizations, in turn, are situated in political and economic contexts that govern the conditions of work. Thus, when we talk about technology, we cannot forget about all those other human factors that affect its use and what it does to the lives of workers, employers, and citizens. In addition, these factors are themselves often in conflict. The inventors of the personal computer generally saw it as a toll of liberation, allowing individuals to communicate worldwide, get access to information not easily available otherwise, and have an impact politically. It can also be used, however, to control workers' time, just like the assembly line in Henry Ford's day" (Carnoy 2002, 50).

It is therefore not the technology itself that changes labor, by allowing labor to be more flexible, for example; it is how technology is applied, used and judged that influences the condition of labor.

Because the "information technology revolution" has been the key factor for changes in the economy and in production processes and therefore in capitalist systems since the 1970s, Castells speaks of "informational capitalism" as the new economic structure (Castells 1996, 18). The concept of "informational capitalism" is based on the informational technological paradigm, which includes the premises that information today can be considered as raw material; new technologies shape (not determine) society; and technical, business, as well as social networks are very important. Both flexibility and the emergence of highly integrated systems are important characteristics of the informational technological paradigm (Castells 1996, 60ff.).

Castells differentiates between globalization as currently developed and the former international world market, pointing out that networks that operate within globalization are now based on modern ICT, thus providing the opportunity to arrange their production processes in real time.

In his study about flexible labor markets in Silicon Valley, Benner points out that globalization and localization coexist, although localization is often disregarded in discussions about the effect of globalization. He points out that both phenomena, however, are responsible for the increasing labor market volatility (Benner 2002, 16).

Using the approach of informational capitalism to analyze labor in a global economy is valuable to explain recent developments. It is obvious that ICT has had a huge impact on economic activities and on people's life, affecting both everyday life and work life. The massive impact of ICT on society warrants theoretical and empirical

approaches like those of Castells, Schiller and Haug. In addition, focusing research on changes in labor is reasonable because labor plays a major part in people's lives. Castells, Schiller and Haug augment and question traditional approaches and theories about society and economy through their broadened perspectives and expanded analysis within new categories. Especially Castells emphasizes the categories of space and time as fundamental within recent restructuring of the labor process. In my study about the development of the IT industry and software developers within "informational capitalism" I have followed this approach and have found more evidence to support these findings.

1.2 Organizational Development

Historically, the formation of the capitalist system was bound to the development and diffusion of organizations. This process was influenced by, for example, the application of new technologies or the tapping of new resources. Additionally, labeling societies as network, information or knowledge societies refers to incisive organizational changes in society (Allmendinger and Hinz 2002, 21). Finally, "[the] transformation in labor market structure has been paralleled by equally important shifts in industrial organization" (Harvey 1990, 152). Hence, organizations are important elements of informational capitalism. Understanding their structure tells us much about labor processes in informational capitalism.

Organizational structures can be flexible and inflexible. *Scientific management* or *Taylorism*, developed by Frederick Winslow Taylor, serves as a reference point of a rather inflexible organizational principle. It constituted the first major change in management practices since the beginning of industrialization. It introduced management principles in production companies by presenting a method for improvement instead of making changes based on an organizational principle. Organizations could apply scientific management in their corporation, making adjustments for their specific situation. There are three basic principles of scientific management: (1) the dissociation of the work process from the worker's skills; (2) the detachment of the planning and implementation process for producing a specific product; and (3) the managerial control of every step of the work process. Overall, the fundamental principle was that not the worker but the management knew of the best way to organize the work process. Therefore, scientific management applies the process

of rationalization to the organization of work (Taylor 1967 [1911], 35ff., Mikl-Horke 1997, 56ff., 64ff., Kieser 2002, 75ff.).

The application of scientific management came along with mixed results. Indeed, there was an increase in productivity. The impact on workers, however, was rather negative. Their work tasks grew monotonous due to the detachment of the planning and implementation process for producing a specific product and lack of attention to an appropriate mix of manual and mental work. In Taylor's approach, workers were not supposed to think independently. Even though one of Taylor's goal was to reduce conflicts between employers and employees, his methods did not turn out to be very employee-friendly. The application of scientific management led to workers' alienation from work, a situation that caused severe motivational problems. Consequences were high rates of absenteeism, less identification with the employer, and less engagement by workers in their work (Fraunhofer Institut für Systemtechnik und Innovationsforschung 1998).

All in all, scientific management represents an organizational structure that demands a high level of control and centralization of the work process and is characterized by a little flexibility.

Despite the fact that Taylorism had more influence in the United States than in Germany, the organizational principle of Fordism was even more significant than Taylorism in the United States (Kieser 2002, 86). Ford introduced a new production principle in his company to produce his Model T or "Tin Lizzy." The most important aspects were the implementation of the assembly line and the introduction of the eight-hour and five-dollar day, which resulted in higher incomes, more free time for employees, and decreasing prices of the produced products. The Fordist production principle can be described as highly inflexible, because it was based on a high division of labor. The ability to control labor was maximized during that time. Ford insisted that his organizational principles were independent from Taylor's ideas, but newer studies have shown that Fordism was inspired by Taylorism (Kieser 2002).

A major shift within organizational structures of scientific management was reorganized and discussed by Piore and Sabel in their analyses about "the second industrial divide" (Piore and Sabel 1984). In their study they identified a new way of production, which they call *flexible specialization*. They pointed out that mass production was being replaced by a new production system that is characterized by

being “flexible” on the one hand and “specialized” on the other hand. Small and medium-sized companies that specialize in the production of specific products are able to react more flexibly to desires of the markets than are the large-scale enterprises that use the Taylorism approach of mass production. Piore and Sable’s study was widely acclaimed and formed the base of many social scientific studies. The approach of flexible specialization emphasizes the increasing flexibility in the organizational structure that accompanies technological innovations.

One aspect of their approach that has been criticized is the lack of differentiation in types of flexibility. Piore and Sabel consider only one possible strategy of flexibility. They do not account for the possibilities for multiple kinds of inflexibility within modern business strategies (Williams et al. 1987). Also, in Harvey’s point of view, Piore and Sabel’s approach is too extreme, because “flexible technologies and organizational forms have not become hegemonic everywhere” (Harvey 1990, 191). This view is supported by Sayer, who points out that mass production is not necessarily synonymous with inflexibility and mass production is not automatically an alternative to flexible production (Sayer 1989, 672). Generally, the dichotomy between scientific management and flexible specialization is the subject of much criticism, because in reality both analytical concepts are difficult to find in their pure forms.

Despite critiques of Piore and Sabel’s approach, it was an important and groundbreaking study that principally addressed major changes in the production process of Taylorism, identifying a higher amount of flexibility. Today, mass production and mass consumption are still very important aspects of production processes; however, they are supplemented by more flexible and specialized production within small and medium-sized companies. Both the scientific management and the flexible specialization production principles coexist and are supplemented by more recent principles of production.

Another and more recent production principle within the era of Post-Fordism is called *Toyotism* or *flexible automatization*. It was developed by Taijchi Ohno within the Toyota Company in the 1970s in Japan. As with other production principles, flexible automatization was developed on the basis of modern technology. Along with the application of modern technology came the possibility of better utilization of labor, which included the development of new and flexible forms of work organization, the increasing complexity of work, and the decreasing level of division of labor. Another

important characteristic of the new labor process was the implementation of teamwork, in which each group individually plans its division of labor and organization of work, reviews the quality of its work, and accepts the responsibility for the produced quality. Additionally, the system favored a flat hierarchy structure. Finally, the knowledge, skills, and information of every person involved in the production process became more important.

The implementation of Toyotist production structures led to changes in economic structures. Companies concentrated on core competences and reduced the vertical range of their manufactured products. Continual learning was a central principle in these factories. They start operating on a global scale, and networking structures become more and more important (Ohno 1993).

It is important to keep in mind, though, that the Toyotist production system was often only partially implemented within companies. Therefore, Taylorist and Toyotist ways of production coexisted and still coexist in many companies. Also, both concepts have their roots in the automobile industry, but the principles did and do apply across many companies.

Regarding the German service sector, similar trends of organizational changes have been observed by Carsten Dose, who studied the organizational structure of the German financial service sector. He recognized that the structure was created by the coexistence of the two opposing organizational principles of formalization (bureaucracy) and reflexivity (flexibility), and he pointed out that for organizations to function properly they obviously have to combine their bureaucratic backgrounds with new market requirements for flexibility imposed by outside market demands (Dose 2006).

Due to the dissolving of organizational boundaries, *networks* gained increasing importance lasting recent decades. Powell talks about the blurring of boundaries of organizations (Powell 1990). Networks seem to replace bureaucratic and hierarchical organizational structures within companies. However, networks are not per se an adequate organizational structure for today's capitalist system, just as traditional hierarchical organizational forms were not by themselves the only adequate structure in the past (Schmiede 2006). There are various fields in which traditional ways of production (as described above) are still applicable. But network structures have spread because they fit within many current organizations as a result of the growing direct

influence of the economy on organizations. Networks are arrangements that are able to handle the "immediacy of economy"[7] and in which individuals act more and more indetermined (German: "unbestimmt"). Constantly changing project environment, different addressees of the work and perpetually altering customers are examples of an indetermined work sourrounding for individuals. Networks are systems that allow the indeterminableness of the individual acting more than in other types of organizations (Schmiede 2006).[8] Because networks have become more important than organizations within firm settings, Arthur and Rousseau described the rise of "boundaryless careers" as opposed to "organizational careers" (Arthur and Rousseau 1996). Individuals' careers used to be bound to a specific company or organization, but today their careers develop independent of these institutional frameworks. The moving of workers from one company to another promotes the development of a successful career.

Castells distinguishes between two basic types of networks that constitute organizational flexibility. On the one hand, there are interorganizational networks, which Castells refers to as interfirm networking. These kinds of networks include global networking between small and medium-sized firms as well as contracting within a global organization. On the other hand, he identifies intraorganizational networks, which he labels horizontal corporations. These are characterized by modern organizational principles such as flat hierarchies and team management (Castells 1996, 160ff.). Knoke broadly analyzed business networks in "the new political economy" (Knoke 2001). Besides discussing the function of inter- and intraorganizational networks, his dense investigation of the new employment contract is helpful for this study. Basically, he pinpoints how the various aspects of increasing flexibility of the employment contract have significant effects on the workers. He concludes:

> "Any tendency to romanticize the high-performance workplace must be balanced against the intense self-monitoring and peer pressures that kept many workers effectively buckled into straight jackets of their own devising" (Knoke 2001, 203).[9]

In addition to the business networks described above, social networks have become increasingly important in the workplace. Both formal and informal social networks are important in the labor process.

---

[7] In Germany the concept of the "immediacy of economy" ("Unmittelbarkeit der Ökonomie") was introduced by Schmiede (e.g. Schmiede 2003).

[8] The increasing indeterminancy of and within society due to developing technology is discussed by Gamm et al. (Gamm 2000, Gamm and Hetzel 2005).

[9] Knoke's results will be discussed in more detail in chapter 6 of this study.

In general, networks have a flexible organizational structure regarding several dimensions. The involved actors, for example, are flexible concerning their membership and involvement, because an individual's involvement in a network is limited by the specific goals and projects. More than in bureaucratic or hierarchical organizations, individuals might be members of the network only for a specific period of time and then turn to involvement in other networks. In regard to the dimension of space, networks operate highly flexible, often without a spatial connection. Networks are often temporary regarding specific problems or projects.

Because networks are tele-mediated cooperations, they incorporate a new kind of space. In the context of networks, territorial space is not the most important space, but tele-mediated information space becomes more important.[10]

Overall, networks have always been important, but during recent decades they have become more dominant compared to other organizational structures like hierarchies and markets. Networks are contrasting organizational structures to markets and hierarchies respectively bureaucracies. Networks involve a particular combination of flexibility, continuity and relationship building within an organization. Additionally, networks influence the traditional role of organizations within the labor process.

1.3 Institutional Changes

Because economic structures and organizational settings in society have been shaped by institutions, it is important to consider the regulatory framework of the above described changes in economy and organizations. Especially when comparing the restructuring of the labor process in two countries, the different institutional premises need to be understood. This is helpful, because different trends within the labor process in both countries might be attributed to different institutional settings. In that case, it would be problematic to talk about global trends of restructuring of the labor process. In contrast, similar changes of the labor process within the different institutional frameworks of the United States and Germany point to global developments of the labor market.[11]

[10] The role of territorial and tele-mediated information space will be further discussed in chapter 4 of this study.

[11] With "global" I refer to trends beyond the United States and Germany. But I use the attribute "global" in a narrow sense, factoring out underdeveloped and transition countries and focusing on developed nations.

Regulations, labor markets, and the flexibility of the labor process differ between the United States and Germany due to the specific institutional frameworks. Nevertheless, even though market, and institutional structures developed differently between the two states, there is "… strong evidence that the modalities and targets of, as well as the capacities for, state interventions have changed substantially since 1972 throughout the capitalist world" (Harvey 1990, 170). Even though the ways states intervene in the capitalist structures within their countries differ, there are similarities in how countries deal with their capitalist systems.

> "But what is remarkable is the way in which national governments of quite different ideological complexions – Gaullist in France, the Labour Party in Britain, Christian Democrats in West Germany, etc. – engineered both stable economic growth and rising material living standards through a mix of welfare statism, Keynesian economic management, and control over wage relations. Fordism depended, evidently, upon the nation state taking – much as Gramsci predicted – a very special role within the overall system of social regulation" (Harvey 1990, 135).

As background for this study it is important to take the different US and German labor market situation into consideration.

> "While Germans are fascinated by tremendous U.S. job growth during the last decades, Americans are equally captivated by income growth and social stability in Germany" (Buttler 1995, 1).

More than a decade later this quote still accurately describes the current economic situations in both countries. Comparing the labor market situation in both countries, the level of regulation is one of the most discussed topics. Generally, the level of governmental regulation is viewed as relatively low in the United States and comparatively high in Germany. Regulation is usually associated with politics that work against the market. Economists repeatedly point to the fact that this is not necessarily true (Buttler 1995, Stiglitz 2004).

The call for deregulation in Germany has dominated the political and economic scientific debate in Germany for years. Followers of the neoclassical theory insist on the need for more deregulation. They consider deregulation as one of several instruments to enhance supply-oriented economic policy and as an adequate answer to the challenges of globalization and the self dynamics of modern ICT (Donges 2002, 19). One important aspect of deregulation concerns the necessity to increase flexibility for companies and workers. In her analysis of the development of the standard employment contract in Germany, Kress contradicts the theses that increased deregulation of the labor market leads to an erosion of the standard employment contract. Rather, she finds

other factors influencing the increase in flexible employment and the decline in the use of the standard employment contract, such as economic structural changes, lean employment strategies, and social structural changes (what she refers to as individualization) (Kress 1998). Providing another view of deregulation, Harvey concludes in his study: "The role of the state as a lender or operator of last resort has, evidently, become more rather than less crucial" (Harvey 1990, 169). According to Keller and Seifert, increasing flexibility can, in a broader sense, be considered deregulation. In addressing deregulation, these theorists discuss a concept that combines a greater flexibility of the labor market with an adjusted concept of social security: the "flexicurity concept." The current German security system is based on the standard employment contract. Keller and Seifert promote a combination of increasing flexibility and adjusted forms of regulation instead of too much deregulation followed by a loss of social security for workers. Actors of that system are the state as well as the parties that are involved in bargaining. They posit that the new framework should not have strict rules but should create better options for the involved actors. A role model for this framework is the Netherlands, where the concept has its roots. The flexicurity concept combines four basic principles: (1) transfer labor markets, (2) collective bargaining and management policy that protects employment, (3) lifelong learning, and (4) basic pension or flexible entitlement to a pension[12] (Keller and Seifert 2002, 2000). Keller and Seifert's suggestions concerning the implementation of a flexicurity concept are valuable because they take the increasing erosion of social security in Germany into account that accompanies an increase in flexible employment and deregulation. Keller and Seifert's idea specifically addresses the German situation and does not include suggestions for the US situation.

In his analysis of the US labor market, Paul Osterman gives an overview of major changes in the labor market. In his view it is best to explain the current labor market situation by comparing it to changes in earlier situations. Generally, he describes the changes in the American labor market as a "loss of order," which explains the public unease even in times of good economic news. On the basis of *Wall Street Journal* reports, Osterman found that more firms lay off people when the firms are economically

[12] The basic pension (German: "Grundsicherung bezogen auf das Rentenalter") and the flexible entitlement to a pension (German: "Flexible Anwartschaften") approaches take the flexible professional life course into account, by not penalizing discontinuities and interruption within the professional life.

successful. As a consequence, job security has declined over the years. Employment tenure also decreased, because the internal labor market declined.[13] Generally speaking, the rules of how work is being structured have changed dramatically (Osterman 1999).

The labor market works differently than do commodity markets. Institutions play a more important role, but norms are also more important, because rationality is limited in that market, which is created by interaction of people. The norm about when it is reasonable to lay off employees has changed. Today, maintaining a competitive edge provides an adequate reason to fire employees. Following World War II, the market structure has changed, because of increasing competition and new systems of management and control that grew from developments in ICT. For example, it is possible to decentralize knowledge and the power to make decisions, while centralizing information and thereby strengthening the role of corporate management, through applying modern ICT.

The concerns about capital markets shape, according to Osterman, the managerial behavior more than it did in the past (Osterman 1999, 34ff.). Osterman emphasizes that the job security of college-educated workers has declined, with the result that the gap between these workers and uneducated workers has decreased. His analysis concerning contingent employment is contradictory to other studies about changing work patterns. On the basis of data from the American census and the American National Establishment Survey, he concludes that the rise of contingent employment has leveled off. Basically, the American labor market can be characterized as being volatile and flexible.

I am now turning to the German labor market, focusing on current labor market reforms. A fundamental reform of German labor market institutions has taken place since the beginning of the 21st century. At the core of these reforms are the "laws for modern labor market services," which have been developed by the committee of modern labor market services.[14] The first and second law of the reform became effective on January 1, 2003. The first law concerns modernizing the institutional framework of the labor market for rapid and sustainable job placement as well as establishing new

[13] As shown in chapter 6 the internal labor market might loose some influence but still remains an important market concerning labor processes.

[14] The laws are commonly known as "Hartz Reforms" and the committee as "Hartz committee". Peter Hartz, a manager and member of the board of directors at Volkswagen Company, was the head of the committee that was established by the German government in the early 2002.

methods for employment possibilities, such as temporary work agencies, new ways to become self-employed, abatement of illegal employment, and service work in private households. The second law regulates the newly introduced "Ich-AGs" and so-called mini-jobs.[15] It also addresses regulations for establishing job centers[16]. The third law for modern labor market services was introduced on January 1, 2004 and concerns the following aspects: Conversion of the German Federal Labor Office,[17] simplification of unemployment insurance, simplification of labor market policy, further development of the mobilization approach of the labor market policy[18], extension of employment security for older employees, and developing employment potential of younger people. The fourth law, which went into effect on January 1, 2005, has had the greatest impact and public interest, especially critical voices. The law is controversial mainly because it contains major cuts of transfer payments, like unemployment support. In addition, the possibility of earning money in addition to transfer payments is further restricted. On the other hand, payments that support the integration of unemployed persons to the labor market have been increased. In general, the organizational changes instituted by the Germany government are supposed to increase the efficiency of labor market policy (Allmendinger et al. 2005, Bundesregierung 2006).

As analyzed by Osterman regarding the US American labor market at the end of last century, layoffs in companies that have a good profit margin are now also being experienced in Germany. The most prominent example is the Deutsche Bank case, in which thousands of employees were fired while profit margins greater than all expectations were reached and management wages rose to unimaginably high amounts.

The American wage structure can be characterized as highly disproportionate, having a high number of so-called working poor, many workers with more than one low-income job, and unspeakably high salaries at the top levels of management. The result is a large spread between the lowest and the highest wages in the United States.

[15] "Ich-AG" literally means "Me-Corporation" or "I-Corporation." Businesses that are set up by unemployed persons who are supported by the government are considered to be "Ich-AGs".
[16] Job centers are organizations that specilize in finding jobs for unemployed people. They work closely together with the German Federal Labor Office.
[17] In 2004, the German Federal Labor Office as been renamed from the "Bundes*anstalt* für Arbeit" to the "Bundes*agentur* für Arbeit." Former term has a public bureaucratic undertone and latter is supposed to have more modern associations.
[18] The mobilization approach of labor market policy (German: "aktivierende Arbeitsmarktpolitik") aims at a greater mobilization of unemployed persons to start working again. Important elements of that policy are to provide incentives for a greater personal responsibility, to encourage a capability to independently adapt to the challenges of the labor market and to boost openness to act hazardously.

Although there is a minimum wage in the United States, it does not prevent high proportion of working poor (for more specific data view chapter 3).

The wage structure in Germany differs from that in the United States. Although inequity in German wages is increasing, it is still not at the level of inequity as that of the United States. Germany does not have a regulated minimum wage yet, but there are recent discussions about the implementation of a minimum wage or subsidized wages among unions, employers, and politicians. Several dimensions of this discussion need to be taken into account: the level of the minimum wage, the role of the minimum wage in collective wage agreements (weakening or strengthen the system), and implementation of other programs in conjunction with a minimum wage, such as the so-called "Kombilohn."[19] Even though Germany does not have a minimum wage, there is de facto a minimum wage that is set by the industry (Brodsky 1994, pp. 56). However, this situation has changed during the last 10 years. In Germany, implementation of a legal minimum wage is being discussed now, as it becomes apparent that industry feels less and less responsible for paying a de facto minimum wage. The increasing competition of labor forces, especially with the influx of Eastern European laborers, is one of the reasons for industry's dropping de facto wage standards. Bispinck sees a possibility and maybe even a necessity to combine the weakened collective wage agreement with a minimum wage for those situations where socially acceptable minimum standards are not reached (Bispinck 2003a).

Unions also have an important role to play in institutional changes affecting work. Overall, the organizational structure of union activism differs a lot between countries (Lash and Urry 1987). An understanding of the major differences between unions and the labor movement in Germany and the United States is important as a background to the analysis of unions in the IT sector and for IT occupation discussed in chapter 6.

According to Harvey the workforce in the United States was divided between predominantly white, male, and highly unionized groups and "the rest." "The exclusionary power of the unions strengthened their capacity to resist de-skilling, authoritarianism, hierarchy, and loss of control in the workplace." (Harvey 1990, 138).

[19] Literally translated the "Kombilohn" means „combined wage" and implies a governmental subsidy of low wages to increase the incentive to work instead of living on social welfare or unemployment support.

But the power of unions declined tremendously during the last decades. At their peak in 1945 unions represented 35.5 percent of the US private sector labor. During that time they played a central role in structuring the postwar labor market (Osterman 1999, 30).

In 2005, there are 15.7 million union members in the United States, accounting for about 12.5 percent of total payrolls. Interestingly, although surveys showed that there was a potential of 57 million workers in America who would join a union, employers were successful in hindering their employees from joining unions and thereby preventing their ability to improve their working conditions (AFL-CIO 2006).

In Germany, about 6.7 million people (17.4 percent of the workforce) are organized in unions today. Since 1991, there is a strong decline in union members.[20] The eight major unions are combined in the Federation of German Trade Unions (Deutscher Gewerkschaftsbund DGB), which views itself as the voice of the unions against employers and employer representatives.[21] Examples given for reasons for the loss of union members are dissatisfaction with the policy of the head of the unions, societal tendencies toward individualization, high unemployment, not enough bargaining success, or not enough overlapping interests (Hälker 2004, Negt 2004).

In Germany, works' councils represent union interests within companies.[22] Members of a German works' council are not necessarily union members but are independent groups of representatives for workers. Despite their official independence, unions have a big influence on the political approaches of works' councils. Usually the majority of works' councils members belong to a union and a council usually follows union policies, but they also try to take into consideration the current situation of their company.

The role of works' councils is controversial, because it can be considered a symbol of the relatively high influence of workers within companies and an important

[20] After World War II the union membership in Germany almost constantly grew until the German reunion in 1990 reaching its peak at about 11.8 million people in 1991. Since then, the union membership perpetually declined, reaching about the level from 1970 again (Deutscher Gewerkschaftsbund (DGB) 2005).

[21] The two most important unions are the IG Metall (metal industry) and ver.di (service sector industry). In March 2001, the German service union ver.di emerged with the fusion of five different unions. Until about the middle of 2005 ver.di was the union with the highest number of members. Currently ver.di holds 2.36 Million members and the IG Metall holds 2.38 Million members.

[22] The general regulations for works' councils can be summarized as follows. A workers' council can be founded in companies with at least five full-time employees. Three of them must be eligible. Employees are eligible when they are older than eighteen. Temporary workers ("Leiharbeiter") are eligible with at least three months employment in that company. Not eligible is the executive staff. A workers' council is elected for a period of four years (Hälker 2004). The last nationwide election took place in the first half of 2006.

feature of the social market economy. Because of this role, they are often viewed as causing highly regulated and inflexible situations in companies. With rising unemployment even the workers themselves criticize the great influence of works' councils within their companies, indicating that they prefer poor employment conditions over being unemployed, which in their view is a result of too many demands from works' councils for improved conditions. This leads to a weakend role of works' councils in companies. Therefore, courts take over the aspects of work such as regulating working time and dismissals that used to be the subject solely of works' councils (Brodsky 1994).

Since the end of last century, researchers have referred to a crisis of the bargaining system in Germany. One important aspect of the crisis is the loss of bargaining power over wages, which is especially apparent in Germany compared to the situation in the United States.

> "Given the widespread characterization of the German labor movement as strong and the American as weak, it is clearly surprising to find that the German labor share of income declined much more in the late 1980s than did the American" (Buttler 1995, 6).

The commitment to wages that are based on negotiations between unions and employer representatives has decreased over a period of years. Bispinck, a researcher at the union-oriented research institution WSI, differentiates between an outer and an inner erosion of the collective wage agreement in Germany (Bispinck 2003b).[23] Outside erosion has occurred as criticism, especially from conservative politicians and employers representatives, has become more and more intense. Also, the income levels have continually dropped. The inner erosion of the collective wage agreement concerns the trend toward flexibility within collective bargaining policies. Bispinck indicates two different meanings of flexibility. On the one hand flexibility concerns the wage system in terms of "regulated diversity." This is a positive development that could strengthen the role of the bargaining system. On the other hand, however, a negative aspect is that an increase in flexibility could lower income standards or cause them to collapse. The collective wage agreement needs to be an instrument to regulate and restrict the pressure of the market. The wide-ranging acceptance of this establishment by the public will be

[23] In Germany, the level of wages is usually based on collective wage agreements. Collective wage agreements are in turn based on the German collective bargaining policy. Legal foundation for the collective bargaining policy is the German tariff law.

important. Bispinck further suggests that the collective wage agreement needs to be incorporated as an element of the political regulation system (Bispinck 2003a).

There are differences as well as similarities in the institutional structure of the labor markets in the United States and in Germany. On the on hand, a significant decline in union membership can be observed in both countries, and the role of labor market intermediaries has increased in both. On the other hand, the countries have different institutional union structures, which have different effects on the US American and German labor market. There is no corollary to the German works' councils in the United States. The wage structures are different, and the inequity of wages in the United States is striking when compared to wages in Germany, although, the trend in Germany concerning wages is moving toward the inequity seen in the United States.

As in Germany, the dominant forms of US employee representation are viewed as being increasingly ineffective. In their research in Silicon Valley, Benner and Dean observed tendencies similar to the German situation. Although unions are relatively strong in traditional sectors in Silicon Valley, they are almost nonexistent in the high-tech industry (Benner and Dean 2000, 361ff.).

The appearance and influence of unions within the IT industry and for the occupation of software developers is low in both countries. This makes the role of unions especially interesting. Chapter 6 will address the general restructuring of unions, the unions' efforts to reach IT workers, the importance of unions in new fields, and the role of unions concerning the IT industry and software developers. The main question is why unions have this marginal role and what developments can be expected concerning the role of labor representatives in the IT industry and for IT occupations.

Basic institutional differences between the United States and Germany are summarized as follows: The economic system of the United States is based on a free market economy in contrast to Germany's a social market economy. The current US economic growth is based on the service industry, while Germany has a production related service industry. The US labor market is considered flexible, while Germany's is considered inflexible. Generally, the level of regulation is considered to be low in the United States and high in Germany.

1.4 Subjective and Individual Dimension

In addition to economic developments, organizational, and institutional changes, a fourth dimension of change needs to be taken into account when considering the developments within the labor process. This dimension addresses the subjective and individual criteria of change. Many social scientific studies have observed a growing trend toward individualization within society, as seen in the decrease in memberships in all kinds of organizations, like unions, but also in political parties, sport clubs, and other institutions. Organizational theoreticians question this point of view of an increasing individualization. They see social changes as the result of an increasing diffusion and differentiation of organizations, not necessarily the result of greater individualization (Allmendinger and Hinz 2002). Despite the disagreement about whether an increase in individualization can be observed or not, the influences of economic restructuring on the subjectivity of individuals are important to consider. The role of economic developments in influencing work life is especially important because of the increasingly intense connection between an individual's work and private life. As it becomes harder to separate work and private life, changes in one area affect people more intensely.

One important study that takes this dimension into account is Richard Sennett's case study *The Corrosion of Character* (Sennett 1998). Sennett shows important insights into how recent changes have had a major impact on people's personalities. He gives examples of possible negative effects of the increasing volatility and flexibility in the workplace. Several key points in his analysis show the direct influence of economic restructuring on people. For example, today's employees experience a condition that Sennett calls "drift," an increasing fear of loosing control over one's life, which can lead to a "corrosion of character." According to Sennett, as a result of increasing flexibility and volatility there are only a few winners who are able to stand chaos and boundlessness in today's fragmented society. In contrast to the few winners we find a mass of burnt-out losers. People experience a lack of social engagement, with almost no sense of solidarity within society. Sennett characterizes the situation as a loss of one's own coherent life story. Therefore, one of Sennett's quintessential statements is that today individuals need to have flexibility in order to be winners, just as companies need to have flexibility in order to be competitive in informational capitalism.

Sennett emphasizes the benefits of routine, authority, and clearly defined rules. A superficial corporate culture evokes controversy toward a need for continuity of

social relationships. A reduction of hierarchy endangers the possibility for workers to orientate in the labor process.

An older approach to the subjective and individual dimension of labor was introduced by Arlie Russell Hochschild in her book *The Managed Heart* (1983). She develops a concept which she refers to as *emotional labor* in her impressive study about flight attendants. Defining the term *emotional labor* as "the management of feelings to create a publicly observable facial and bodily display;" she states that "emotional labor is sold for a wage and therefore has *exchange value*" (Hochschild 1983, 7). As shown in her study, feelings and emotions are a key component of a lot of modern occupations. Considering the role of emotions in the work process, there are forces and dynamics that influence identity with the workplace and the relationship between society and workplace. The intensity of emotional labor depends on the level of management control and the level of unionization in certain occupations. Given current trends, emotional labor is becoming increasingly important, with the implication that the psyche is increasingly involved in the labor process.

Dan Schiller views "aggressive corporate job cutting" as a source for increasing "anxiety and instability among the corporate workforce." In combination with the growing instability resulting from the flight of capital it becomes increasingly possible for employers to demand more concessions from their employees (Schiller 2000, 207).

All of these analyses touch aspects of how increasing flexibility in the workplace and the labor market influences individuals in subjective and psychological ways. How the role of increasing flexibility influences software developers in subjective and psychological ways will be broached in the second part of this book.

1.5 Summary: Global Developments and Local Particularities

Numerous scientific theoretical approaches had noted a continual increase in flexibility resulting from changes within the economic structure. Beginning with the era of Fordism, representing a highly inflexible economic system, subsequent concepts explain the changes toward an economy with increasingly flexible elements. These concepts favor the idea that can be summarized as "informational capitalism." Recent analyses have emphasized the linkage between economic and technological changes. In addition to these broad economic changes, organizational developments also have moved toward flexibility, as well as placing increasing importance on information technological systems. Networks are often referred to as the appropriate organizational

structure given the need for flexibility and the role of information and technology. Although there have always been network-structured organizations, the characteristics of network organizations have changed due to the development of ICT. Also, networks do not necessarily replace but rather complement traditional organizational structures. Socioeconomic changes always accompany institutional changes. The institutional conditions in the United States and Germany are quite different and have therefore been contrasted in this chapter. Most important are the differences in the institutional influence on the labor market in both countries. However, these differences seem to be declining as the neoliberal and supplyside economic view spreads in Germany and the United States. It is becoming clear that these economic and organizational developments directly influence personality and individual's behavior.

2 Changes in Labor and Evolution in Information and Communication Technology

This chapter starts with a detailed definition of the term flexibility and of labor flexibility. The subsequent paragraph discusses the role of ICT for the restructuring of labor. The following section introduces the research approach of the study. The last part of the chapter will give reasons for looking closely at the development of the information technology (IT) industry and software developers and why it is reasonable to compare developments in the United States and in Germany.

2.1 The Concept of Flexible Labor

The term flexibility

In some dictionaries for social science the term "flexibility" is not defined at all (e.g. Endruweit and Trommersdorff 2002, Hillmann 1994). In those dictionaries that do define the term, the definitions of "flexibility" are superficial, but the existing definitions are helpful as a starting point. Flexibility is generally defined as the ability of an organism to react quickly and reasonably to change or new situations and to adjust its behavior to this new situation. Flexibility is contrasted to rigidity (Reinhold 1997). A different dictionary gives a more specific definition of flexibility in the context of an organization, stating that flexibility means the ability of an organization to adapt to internal forces or changes occurring in its environment. In that context, flexibility is also described as an important basis for stability, continuity, and success within an organization (Fuchs-Heinritz et al. 1994). These definitions miss important aspects that are included in Benner's definition of flexibility. He defines flexibility "as the ability to change or react to change with little penalty in time, effort, cost, or performance." And he goes on: "Yet change always entails some cost, and the benefits of flexibility to one actor in the economy may, and often do, come at the expense or loss of others" (Benner 2002, 14). Benner's criticism of flexibility is described by Brodsky as the general European view of labor market flexibility, whereas he sees the American view concerning flexibility within the labor market as predominately positive (Brodsky 1994, 60).[24] Recognizing recent research and developments, we need to acknowledge both positive and negative aspects of flexibility within labor markets. In Europe, the positive aspects of flexibility are increasingly touted, even while negative outcomes become

[24] As Benner demonstrates, there are American scientists that are rather sceptical, too. But there is a tendency toward a rather critical European and a rather positive American attitude towards flexibility.

more apparent. In the United States, people have started recognizing the difficulties brought about by flexibility in their lives and have started discussing alternatives. All in all, positive aspects of flexibility are often overemphasized in public discussions in both countries due to the major influence of certain actors in the labor market, such as large corporations and their representatives as well as political voices influenced by industry. Hence, it is important to point out dangers that come along with constantly increasing flexibility.

Considering all of these aspects of flexibility, it is important to keep in mind that *flexibility is a process of adaptation to change that may have benefits for the involved actors but may also be accompanied by detriments for the individuals affected by flexibility*.

Labor flexibility

Labor flexibility is not an entirely new phenomenon. Rather, it has always been part of the development of labor processes. Some researchers do not see an increase in flexibility or anything new about the capitalist search for flexibility. They question the empirical groundings of the talk about an increase in flexibility (Pollert 1988, Sayer 1989). Pollert especially disagrees with the analysis of a new flexible workforce, stating that it is not a radically new phenomenon. In addition, she points out that opposed approaches, such as the neoliberal and neo-Marxist approaches, surprisingly agree on their general propositions concerning increasing flexibility in labor (Pollert 1988, 70). In my view, even if flexibility has always been an issue in capitalist society, there is a clear change in how important flexibility is considered in recent discussions and how it has penetrated the discussion about changes in work and employment conditions. In addition, what is often referred to as increasing flexibility in recent changes in the labor process has a new dimension that was not considered until the end of the 1980s. Pollert and Sayer made the important point that the term flexibility is a highly value-laden concept and often not appropriately defined in studies about flexibility. Also, they noted that the contrast of flexible versus inflexible labor needs to be constantly challenged.

Two years after identifying the loss of importance of the standard employment contract in Germany (Hoffmann and Walwei 1998) Hoffmann and Walwei confirmed a loss of the importance of the standard employment contract in all European countries

(Hoffmann and Walwei 2000).[25] Originally one of their propositions was that through a reform of the standard employment contract (e.g., the reduction of the social security contribution), the standard employment contract could be consolidated again. But it has become apparent that their interpretation that the standard employment contract has lost importance was more realistic. The reasons for the decreasing significance of the standard employment contract, however, differ between countries and are not easy to evaluate from existing empirical material.

Another important point of argument was introduced by Mückenberger (1985), who questioned the existence of standard employment from an institutional and regulatory point of view. He emphasized that the standard employment relationship – which is often referred to when talking about an increase in flexible labor – never existed. Whether or not it ever existed, since the mid-1980s the standard employment relationship has lost its role as a "dominant fiction" (Mückenberger 1985, 460, 472).

The origins of some aspects of labor flexibility can be traced back to the 1970s, as changes occurred in the labor force along with changes in the Fordist production system.

Sabel and Piore hit the mark regarding flexibility with their empirical study of the Northern Italian labor market. They argued that a new era of production, which they called "flexible specialization," had developed. The concept of flexible specialization describes an important step concerning labor flexibility within organizations (see also chapter 1.2).

Aside from this production principle that made discussions about increasing flexibility popular, a common view of labor flexibility differentiates between internal (or functional) and external (or numerical) flexibility. Internal flexibility refers to the restructuring of labor within a firm, for example concerning the arrangements of work hours within a company. External flexibility includes hiring and firing as well as the implementation of flexible employment conditions (see, among others, Matthies et al. 1994). Although internal and functional as well as external and numerical types of flexibility are usually used as synonyms Keller and Seifert draw distinctions among all four types. Internal-numerical flexibility primarily concerns the temporal adjustments of the labor volume to accommodate changing capacity needs. Internal-functional

[25] With standard employment contract the authors refer to the full time employment relationship that was typical during the last decades. It is usually associated with a permanent full time position.

flexibility concerns the adjustment of labor organization and broad qualifications of the employees (which is less developed in the Anglo-Saxon countries). External-numerical flexibility concerns the adjustment of the number of employees. And, finally, external-functional flexibility concerns the adaptability of the workforce on the external labor market (Keller and Seifert 2002, 91and 2000, 292).[26]

But, as Benner points out correctly in his study, the differentiation of internal and external flexibility misses important aspects that are relevant within regional labor markets. In principle, these definitions of flexible labor give too much weight to the role of individual firms, and for network-based organization, the labor process demands a different definition of flexibility (Benner 2002).

In his study of flexible labor markets in Silicon Valley, Benner introduces a broader concept of labor flexibility, which helps in understanding the long-range changes in employment and work. He distinguishes between work and employment as well as between flexible work and flexible employment, because this differentiation helps to point out the controversial effects of flexibility on actors in the labor market. In addition, it helps in analyzing processes across company boundaries. As networks become more important, it is crucial to analyze flexible labor processes not only within a firm's setting, as is commonly done, but across firms. Benner points out that flexible work helps companies become successful in economic competition. To some extent, flexible work improves employees' environment as well, although it may have negative effects on workers, too. In Benner's analysis, work refers to what people actually do while engaged in production. Several aspects of work can be flexible such as work requirements, work-related knowledge, and the quantity of work. Flexibility facilitates performing work that is characteristic of the information revolution. Benner focuses on the pace of the changes. That is, beyond the changes in the quantity of work and the skills, knowledge, and information required, rapid change itself is what most characterizes the labor process in the information economy. In addition, reflexivity – the need to consequently challenge work tasks through applying knowledge, skills, and information – becomes important in the work process. Reflexivity not only makes great demands but also creates opportunities for workers. Flexible work therefore refers to those aspects of the "actual nature of the activities people do while engaged in the

[26] Keller and Seifert's discussion about deregulation as a currently more often addressed aspect of flexibility is briefly discussed in chapter 1.3.

process of production" that face rapid changes and need constant adaptation by the workers (Benner 2002, 22ff.).

Although flexible work, according to Benner's findings, is necessary for economic success, flexible employment relations are often the result of the institutional, regulatory, or organizational changes made for the benefit of an older industrial economy. Benner notes that these changes may be used to increase short-term profit and to cut costs, but "in many ways undermine the long-term competitive success of the region" (Benner 2002, 5).[27] Employment refers to the "informal and formal contractual relationship between worker and employer" and flexible employment includes the rise in external employment relations, such as subcontracted, self-employed or contingent labor, weakening of direct employment contracts, and mediated management practices (Benner 2002, 24). A lot of studies about flexible labor do not differentiate between flexible work and flexible employment. This leads to inaccuracies when interpreting the effects of flexible labor on both employees and employers in the labor market. It is most important to distinguish between the two phenomena, because employees with flexible work conditions do not necessarily have flexible employment conditions and vice-versa. Moreover, the outcomes of each are, as stated above, quite different.

In 1984 Werner Sengenberger compared the labor market flexibility of the United States with that of Germany. He particularly considered the relation between a highly flexible labor market and the increase in employment in the United States and contradicted the common view that flexibility leads to more employment. During the 1970s and 1980s US employment rose, mainly in the service sector, because the size of the service sector is strongly related to the population growth. Also employment of women and teenagers increased significantly during that time. Nevertheless, the cycle-adjusted unemployment rate increased during that time. Hence, the increase of employment that resulted out of a higher population is accompanied by an increase in cycle-adjusted unemployment. Therefore, the structural component of unemployment increased during the 1970s. Sengenberger argued that flexibility needs to be defined relatively; taking into consideration a system's starting point before measuring the increase or decrease in flexibility. He suggests looking at the "net-flexibility" when considering the results of an increase in flexibility (Sengenberger 1984).

[27] Chris Benner researches flexible labor markets in Silicon Valley. He is therefore interested in the effect of flexible labor on the region rather than on companies. His definition of flexible work and flexible employment is based on the assumption of a diminishing role of companies in contrast to networks within regions.

Contemporary approaches to flexibility have begun recognizing the importance of qualitative and subjective results increasing labor flexibility. The negative aspects of increasing flexibility are discussed by Zilian and Flecker (1998), who question whether increasing flexibility really offers more freedom of action to the employee, as often supposed. Zilian proposes that in reality flexibility leads to a fragmented life (Zilian 1998). I think that this is especially important when looking at flexible labor in informational capitalism. Focusing on quantitative aspects of flexibility limits a full understanding of current developments of economic restructuring. I think that the effects of flexibility are especially significant at the individual level, and further, that modern communication structures play an important role in the subjective dimension of work affecting the individual.

In his definition of labor market flexibility, Brodsky includes the following six categories: flexibility in labor costs, conditions of employment, work practices and work patterns, rules and regulation, mobility, and education and training.[28] Brodsky summarizes three general negative outcomes of a flexible labor market: income inequality, workplace turbulence that weakens labor relations practices and human resource policies, and short-term responses that reduce the workforce productivity (Brodsky 1994).

All in all, I agree with Brodsky who concludes his analysis about the term labor market flexibility with the notion that labor market flexibility is a concept that defies a simple definition and indeed has different meanings for different people and in different contexts (Brodsky 1994, 60). Because of this complexity, I have described my underlying understanding of labor flexibility in this study, to help the reader to understand the term as used here. Keeping the difficulties of a definition of labor flexibility in mind, I define *labor flexibility as both the qualitative and quantitative adoption to change in the dimensions of space, work, employment and time that have positive as well as negative effects on the involved actors and that occurs in a relatively short time frame and with relatively low costs.*

2.2 Role of ICT

As introduced in chapter 1, the explanation of current social and economic changes that underlies this study is informational capitalism, which sees an increasing importance of ICT for social changes. Informational capitalism considers not only the

[28] Brodsky's definition is based on the definition of flexibility used by the OECD.

diffusion of modern technology, but also the qualitative aspects of ICT and the increasing significance of information and knowledge in economy, society, and the labor process. This overall process of the growth and impact of ICT is described as "Informatisierung" in the German social science literature.[29] A most important aspect of this concept is the perspective that exposure to information is a social process that is conscious and systematic. The aim of the exposure to information in that context is to use the information independently of the subject (Boes 2005b). There are various aspects that are important to keep in mind when referring to this kind of understanding of the increasing importance of ICT.

First, while information and knowledge have always had a central role in societal developments, this role is changing in connection with modern ICT. Also, it has become even more necessary to distinguish between knowledge and information, because information can be processed through technological systems independently of a person, but knowledge is inevitably connected with a person. In addition, how information is transformed into knowledge depends on the given knowledge of the person who transforms the information into knowledge.

Second, a lot of researchers who discuss the increasing importance of ICT and the associated new role of information and knowledge do not pay sufficient attention to the historical relevance of increasing importance of ICT. The impact that the emergence of the Internet and the spread of digital technology has had on social processes has been characterized as a qualitative leap (Boes 2005b) for the social process behind the increasing impact of ICT. Yet, information processing has been important for economical and social developments much earlier. Two prominent examples demonstrate this importance. One example is the beginning of the transformation of communication in writing at the end of the 19th and beginning of the 20th century. Information to be communicated was systematically written down, thereby preserving it

[29] "Informatisierung" as understood in Germany can be traced back to a publication edited by Rudi Schmiede in the middle of the nineties (Schmiede 1996b). "Informatisierung" is often translated as "informatization." The term was introduced by two French scientists, Nora and Minc, with their report "L'informatisation de la société" in 1979 (Nora and Minc 1979). Originally, the term described only the increasing diffusion of the ICT. This is still the common usage and understanding of the terms "Informatisierung," "informatisation," and "informatization." Schmiede and the research group around him, though, have developed the term further. I am following this approach, which I briefly introduce in this chapter. The underlying concept of "Informatisierung" is important for my research. Noticing that the term "informatization" exists almost only in English publications from writers in Europe and Asia, but can hardly be found in North American publications, I am avoiding using the term "informatization" in this study. Thus, when talking about the *increasing impact (not simply diffusion) of ICT* in this study I refer to the concept of "Informatisierung" as introduced by Schmiede et al. (Schmiede 1996b).

to be available to another party at a later time. This process of writing down information was analyzed by Weber, who referred to it as the bureaucratization of operative communication processes (Weber 1972). Another example concerns the creation of information systems that also took place around 1900. Prominent representatives who discuss this development are Braverman (1974) and Beniger (1986). Braverman developed the thesis of an intensive "deskilling" of employees through the creation of information systems and the application of ICT.[30] Beniger described the development of a "control revolution" due to the increasing importance of information systems.[31] He points out that modern ICT does not lead to less, but to more intense control of, for example, the labor process. It is important to emphasize the *historical* significance of ICT, because there is a tendency to overemphasize the importance of modern technology without recognizing their historical existing influence on society (Boes 2005b).

Schmiede concludes that the history of capitalist production is at the same time a history of increasing importance of information and communication and the development of the correspondent technology (Schmiede 2006). The diffusion and application of ICT can be seen as a precondition for increasing flexibility in many areas, such as the development of an information space, the increasing reflexivity needed for work, and the changes in management control because the application of technology clears the way of these changes. In his article Schmiede notes three important characteristics of modern digital ICT that characterize new attributes. First is the development of the computer as what researchers have referred to as a "universal machine" (Krämer 1988, Heintz 1993). Although previous technological advances were able to deal with specific problems and to handle specific tasks, the computer can be used for a variety of tasks and problems. Crucial here is the capability of the machine to process symbols without any restrictions, in what Schmiede calls the "doubled world of the computer," referring to the fact that two parallel worlds emerge – the reality outside the computer and the world inside the computer. As the information we put in the computer is processed, it is also changed, and new information is sent back to reality. In principle, this can be described as the creation of an unlimited world of information through the universal machine computer. Thus, the first important aspect of digital ICT

[30] This approach and the role of knowledge and skills will be further analyzed in chapter 5.
[31] With the term "control" Beniger refers to the German "Steuerung" rather than to "Kontrolle."

is the high amount of information that can be processed and the way this information can be handled independently of a person.

Second, modern digital technology cannot be viewed simply as a tool. It has become reflexive as it is used to create innovations which are in turn used for more innovations. Technology enables people to make more out of their initial information. The aspect of reflexivity of the system is especially important because reflexivity also seems to become more and more operative in work practices. Technology provides the possibilities for handling information in reflexive ways. In doing their jobs, people are challenged more and more using reflexive technology and acting reflexive themselves.

The third characteristic of digital ICT refers to its impact on space and time. Various technologies create the possibility to function in global information and communication networks independently of time and space. “Operating in real-time” is the expression used to describe this new possibility (Schmiede 2006, see also Schmiede 1996b). When considering labor processes, this aspect of ICT is of special interest. These possibilities are also associated with the “globalized worker” who works independently of time and space. In reality, however, only a small part of the workforce actually uses the developed possibilities. Boes emphasizes that the Internet is the foundation for both traditional information system as well as an open information space, which can be described as a new social interaction space (Boes 2005b). In the following, when I talk about the increasing importance of ICT, I refer to this understanding of a social process that influences the society through new ways of applying information and communicating.

The Mexican scientist Micheli describes the new labor that is emerging due to the increasing importance of ICT as *digitalfacture* (a play on the word “manufacture”), which he defines as “a process in which tendencies in the labor flexibilization of professionals converge with the technological innovations that have given rise to the Internet” (Micheli 2002, 1). In digitalfacture, labor “is based on the transformation of raw material (information) through digital technology” (Micheli 2002, 9). He considers digitalfacture a new profession that incorporates the increasing flexibility and the increasing importance of ICT. Micheli considers it reasonable to speak of an emerging new profession because the organizational innovations and technological changes are so important to create a transformation of professions (Micheli 2002, p. 19). He argues that what we experience today is a transformation in the spheres of labor and communication. Within this new profession, technology and organizations play a more

important role than higher formal education. This new labor paradigm “is centered on flexibilization and information technologies” (Micheli 2002, 8). Micheli speaks of a reciprocal relationship between technology and new professional needs. Therefore, he regards the increase in labor flexibility, in the context of the development of ICT, on the level of occupations. Self-teaching and learning play an important role within digitalfacture (Micheli 2002, 14). Generally, Micheli emphasizes the importance of the full integration of the Internet into the new labor functions (Micheli 2002, 8).

As other researchers (e.g., Manuel Castells) have correctly pointed out, Micheli strikingly shows how we need to focus on the development of labor instead of focusing on markets. The reason for this focus is that common markets have relatively few changes, in contrast to the tremendous changes within occupations and labor itself (Micheli 2002, 18). Two main reasons are given by Castells and others who predict an increase in flexible labor and a decrease in standard employment relations. Due to the increasing application of ICT, the need for traditional spatial production structures dissolve. The dominant role of a physical territorial location of production is supplemented by various forms of production even to the point of virtual network organization structures. Also the *validity* of professional qualification decreases due to the acceleration of the technological development (Castells 1996).

Schienstock holds the application of ICT responsible for an emergence of a new dimension of flexibility because ICT leads to a greater flexibility in organizational structures. An employee’s status becomes more flexible, as his or her functions becomes more flexible (Schienstock 1998).

The impact of ICT on the labor process is also apparent when considering the development of a fourth economic sector, an information sector, in addition to the trhee sectors of agriculture, production, and service. As early as 1977 Porat defined information work as an information sector, thus constructing a fourth economic sector (Porat 1977). About 20 years later Dostal of the German Institute of Employment Research also identified an information sector. Dostal’s analysis is similar to that of Porat (compare Figure 2.2-1 and Figure 2.2-2). As Dostal noted, since the 1950s and 1960s, the agricultural and production sector decreased significantly in size, the growth of the service sector declined and the analytically determined information sector increased tremendously. This is how Dostal analytically determined the information sector: Dostal classified information occupations as those of employees who were surveyed states that more than 75 percent of their work involved information tasks,

Dostal then isolated the information occupations from the traditional sectors and put them into a new sector which he called information sector. The result of his analysis is a clearly increasing information sector (Dostal 1995, 528).[32]

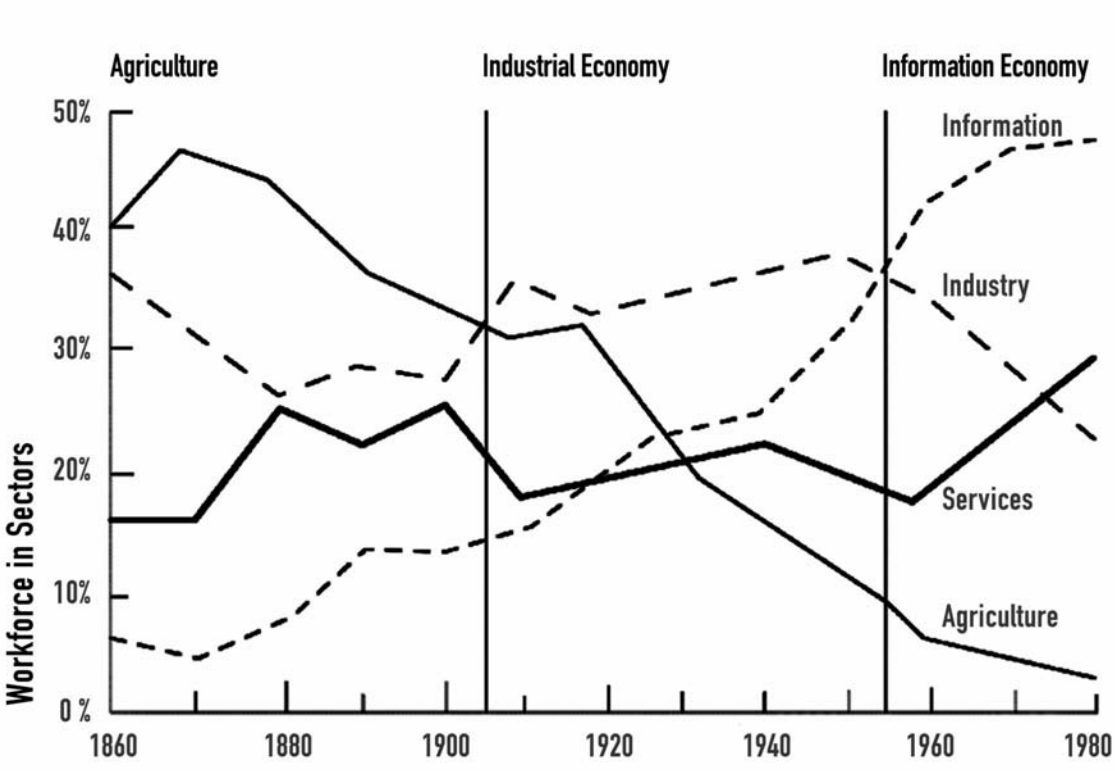

Figure 2.2-1: Illustration of The Information Sector by Porat in 1977 (Porat 1977).

[32] For discussion of comparison of both analysis also view Schmiede (1996a, 107ff.).

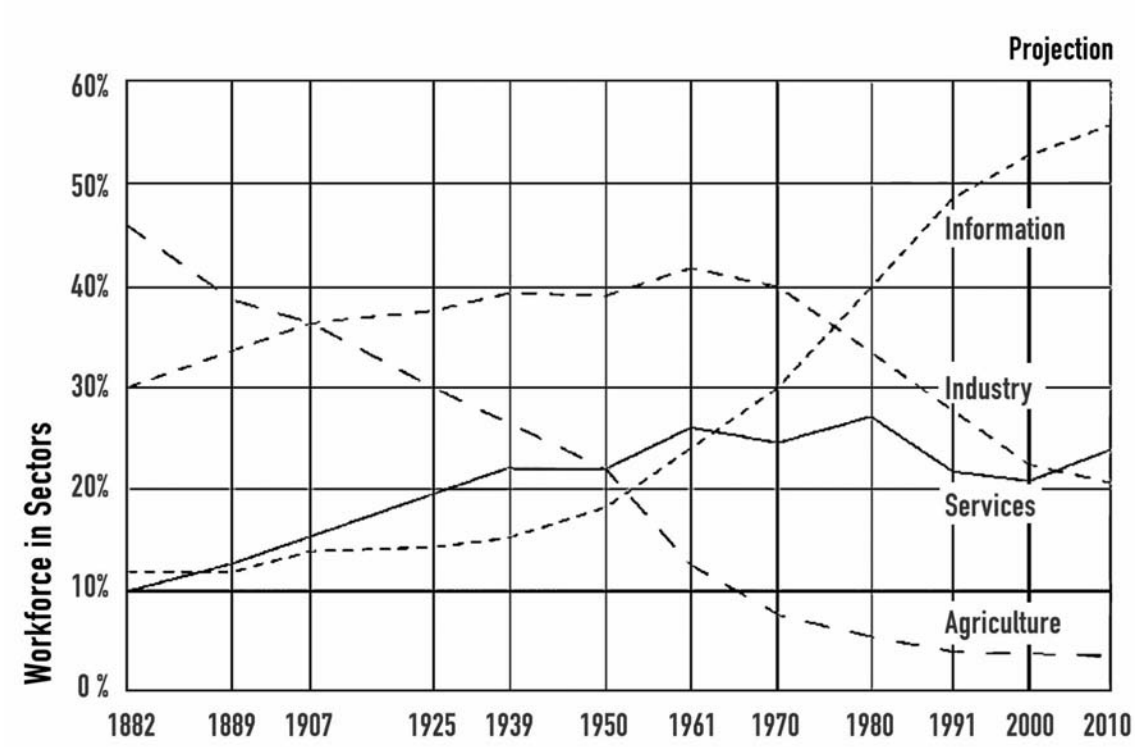

Figure 2.2-2: Illustration of the Information Sector by Dostal in 1995 (Dostal 1995).

In addition to pointing to the emergence of a fourth economic sector, Porat's and Dostal's analyses point out the changing of occupations as a result of the changing role of information. Unfortunately, the definition of *information work* is controversial and large statistical analyses do not operate with anything similar to Porat's and Dostal's definition. Not only is the definition of information work controversial, but also the allegedly easier definition of IT workforce is questionable. As will be discussed further in chapter 3, consistent usage of the term IT workforce does not exist.

2.3 Research Approach and Research Questions

Building on the background I have given about the fundamental role of ICT in changes within the economy, organizations, and individual worklife, my overall thesis is that flexibility of labor is a more complex phenomenon than is currently discussed and becomes apparent within the four fundamental dimensions of the labor process: space, work, employment, and time (SWET). Important bases for this thesis are the developments of the informational capitalism, the diminishing role of organizations and companies within the economy, and the simultaneous rising importance of networks within society. Therefore, the traditional dimensions of flexibility within these frameworks need to be extended.

2.3.1 SWET Analysis

Chris Benner developed the SWET analysis as a "framework for analyzing labor process restructuring along four fundamental, inter-related dimensions of the labor process," (Benner 2006, 1027) which he identifies as space, work, employment, and time. His model for the SWET analysis is the so-called SWOT analysis, which is a tool used in strategic management, non-profit management, and planning in business economics as well as production site analysis in geography.[33] Benner originally applied the SWET analysis to an empirical study of call-center work in South Africa. There, he argued that "the rise in call center employment in South Africa is best understood as one aspect of the broader ways that the rapid development and diffusion of information and communication technologies is leading to rapid restructuring of the labor process"(Benner 2006). The SWET analysis uses quantitative and qualitative information to explain the restructuring of the labor process. I am using the SWET analysis in studying the IT industry and the occupation of software development in the United States and in Germany. Increasing flexibility should be visible within the four fundamental dimensions of space, work, employment, and time. Separately analyzing these dimensions in regard to the aspect of flexibility helps for a better understanding of the complexity of flexible labor.

I have gathered quantitative and qualitative empirical information as background data to help explain how flexibility influences current labor processes. To find out about quantitative changes I have looked at public data and quantitative empirical studies focusing on the software industry and on software developers. For qualitative information I have reviewed qualitative studies from other researchers in addition to collecting empirical data by interviewing American and German software developers. The qualitative material I gathered is being applied at the end rather than the beginning of the project. Therefore, it is not a typical qualitative approach in which concepts are formulated out of the material. Rather, the qualitative material is used to support or

[33] SWOT is an acronym for strengths, weakness, opportunities, and threats. The SWOT analysis examines the internal strengths and weaknesses as well as external opportunities and threats of a company within a four-field-matrix (Hermann and von der Gathen 2002).

supplement specific observations. I regard my interviewees as experts in the changes in the labor process within informational capitalism.[34]

Space

Manuel Castells defines space as the "material support of time-sharing social practices," (Castells 1996, 411) which is helpful as a fundamental understanding of space.[35] Benner distinguishes between territorial and tele-mediated space (Benner 2006) and Boes talks about a newly emerging information space (Boes 2005b). From my judgment, both refer to a space with distinct characteristics from territorial space. I find it useful to refer to a tele-mediated information space, because the term *tele-mediated* associates the important role of modern technology and the term *information* affiliates the importance of information for this space. Thus, bases for tele-mediated information space are the technical possibilities that provide possibilities of communication and interaction. One dimension of the tele-mediated information space concerns the social acting related to activities performed in tele-mediated information space. The development of a globally available tele-mediated information space is seen as augmenting the impact that ICT is having on society (Boes 2005b, 140). In general, tele-mediated information space constitutes a novel space of social action. The Internet is the basic infrastructure for the development of the novel tele-mediated information space in society. The most important characteristic of the tele-mediated information space is that it is open without preassigned communication structures and without predetermined information transfer (Boes 2005b, 140). We know, for example, what kind of information to expect when opening a specific newspaper (critical, right wing, left wing, neutral) or when watching a specific news channel. Also, these modes of communication are always one-way. In contrast expectations regarding information sought on the Internet cannot usually be set. There is a huge debate whether the Internet can be seen as a kind of media that enhances democracy or that causes the opposite and is therefore steeped in undemocratic power relations. An important aspect of the Internet that is not as intensively debated is that it is the first information media with two-way-mass-communication structures. This changes the quality of communication in using the Internet. Internet use is changing from being predominantly selective and

[34] Concerning the role of expert interviews in social sciences and content analysis of interview material from expert interviews, see Meuser and Nagel (1991), Gläser and Laudel (2004), Brinkmann (1995), and Maryring (1993).

[35] Space as a social scientific research category will be theoretically introduced in chapter 6.

reserved to being more and more active and dynamic. Thus, Internet use is becoming more and more important in constituting society (Boes 2005b, 140). In summary, what I refer to as tele-mediated information space following Benner and Boes is the new developing "world" or "reality" that is starting to exist in addition to territorial space.

The tele-mediated information space is more or less developed for different occupations. Some occupations already use a tele-mediated information space, providing workers the opportunity to communicate and interact outside of their territorial space to a great extent. For other occupations, territorial space is still the most important space, as interacting and communicating is concentrated within territorial space (Benner 2006).

The evolving tele-mediated information space is an important issue for labor process flexibility. First, there is more flexibility because people have more than one space within which to interact and communicate. Considering the global spatial labor trends I question the common view that territorial space, including business locations and offices, is becoming less important. I propose that flexibility is apparent in the interaction between territorial and tele-mediated information space. The diversity of options to use different kinds of space for interaction and communication offers flexibility.

Second, a central element of greater flexibility regarding space is the growing importance of business and social networks. Such networks can be either institutionalized within territorial space or developed within tele-mediated information space. In my study, I specifically consider the effect of the flexible organizational structure of networks on the labor process and the role of communication within networks.

In regard to the increasing flexibility and extended influence of ICT on the workplace it is also important to look at office space itself. I am therefore questioning whether office space itself may become more flexible due to the increasing flexibility of work. More specifically, does the flexibility of office space increase as the flexibility of work increases?

Work

Work is defined as "the actual nature of the activities people do while engaged in the process of production. It includes the physical and mental processes required, the tools and technology used, and the relations with other people […] that they engage in

during the process of performing those activities" (Benner 2002, 23f.). I am particularly interested in how work became more flexible for the past. My definition of flexible work is based on Chris Benner's definition, because he focuses on aspects of work that are often not included in discussions about flexible labor. He defines flexible work as the quantity of work required[36], the change in skills, knowledge, and information required for work, as well as the increasing reflexivity in work tasks (Benner 2002, 23f.). I argue that these aspects of flexible work are being influenced by the growing impact of ICT on work. The changes in the quality of work during the last decades are of special interests because it is often assumed that the application of modern ICT improves the quality of work. This assumption will be challenged through looking closely at the potentially negative changes that accompany the increasing use of ICT within the work process.

In considering flexibility, the constant demand for skill development is an important issue. Because the tools and technology used during work change at a pace unknown until now, continual learning is more important than it used to be. Permanent learning also has become necessary because the complexity of cognitive and relational skills required for work has also become higher. This expansion in education requirements is especially true in the IT industry and for the profession of software development, where education, training, and learning may become important issues. Given the influence of modern ICT on the workplace, both education and training should become more and more flexible in order to keep up with the pace of changes. The mix in methods of training, education, and learning can be characterized as flexible. Both, learning by doing and training play an important role. The role of education in the IT field used to be less institutionalized because of the lack of official programs. The number of educational programs that arose during the last years gives the impression of a still quite flexible field of education. If education, learning, and training becomes more flexible over time and how this affects the actual work is a question that I will pursue. In addition, the increasing reflexivity needed in the work process calls for a higher amount of flexibility within people's work. This should be especially visible in the work of software developers. How they use the increasing reflexivity to improve their work is one of the questions I am addressing. Another question that I ask is how

[36] This aspect of flexible work should not be confused with the quantity of employment. With the changing quantity of work, Benner literally means the quantity of tasks and the aligned flexibility that becomes necessary when handling these increasing work tasks.

the tools used by software developers influence their interaction with people – colleagues, costumers, or managers. Does it influence the relationship and if so, what consequences does it have concerning their work activities? Because a common assumption is that face-to-face communication is becoming less important, I will question whether software developers really experience a decrease in face-to-face communication. Finally, I am addressing the increasing influence of the market force on the daily work tasks, which is discussed in modern theoretical approaches. More specifically, I am questioning whether and if so, how software developers experience this influence and how they react to it.

Employment

Employment must be distinguished from work since – in Chris Benner's words – it describes "the nature of the relationship between worker and employer; the processes employers use in directing, motivating and monitoring workers' activities; and the types of compensation provided for the activities performed" (Benner 2006, 1032). Using that definition of employment as a base, flexible employment can be defined as the rise in external employment relations, the weakening of the direct employment contract, and mediated management practices (Benner 2002, 24). Flexible employment also refers to the variation in numbers of employees. In general, in employment, the focus moves from the actual activities employees perform (i.e., work) to their relationship with their employers and to the influence of the organizational structures on the employees. This organizational structure includes employment relations and management practices, as well as wage and benefit issues. Concerning employment relations Knoke accurately characterizes the "the new employment contract" as including institutional but also subjective changes within the employee-employer relationship. Informal networking, for example, becomes more important because employees do not count on a long-term relationship with their current employer. Taking the subjective dimensions into account, Knoke notes that "[the] weakened bonds between employers and employees rupture the supportive psychological connections sustained under the traditional employment contract" (Knoke 2001, 178). Nevertheless, when analyzing employment, quantitative data becomes more important and is more readily available than when considering the changes in work conditions.

Overall, the IT industry is known for its management practices that are supposed to include high flexibility, flat hierarchies, and other characteristics of modern practices.

However, differences exist in the management within the IT industry, so that what software developers experience concerning their management might vary depending on the company they work for. Companies that originally were part of a different industry and only recently moved their business into IT might still follow rather traditional management practices. Other companies, such as start-up companies, might represent the modern management practices better. I address these issues closely in my analysis, where I focus on how management practices express the aspect of flexibility and how this is experienced by employees. My analysis of employment, given in chapter 6, will address employment relations from both the employee and management perspective.

Time

In public policy discussions, increasing flexibility is typically associated with increasing flexibility of working time. This is, as already mentioned, only one aspect of flexibility that ís important in this study. In addition, the dimension of time within the SWET analysis is used more broadly than just addressing issues of working time. In principle, it is helpful to differentiate between individual and economic dimensions of time. The individual dimension refers to aspects of time that are particularly important for individuals and the economic dimension of time addresses aspects of time that effect economic restructuring. I will challenge the universal positive view that flexible working time is positive, pointing to problematic aspects behind these concepts. The widely discussed work-life balance problem is connected with the topic of flexible working time concepts. Whether flexible working time provides opportunities to balance work and private life is an important question. In addition, when regarding the individual dimension of time it becomes obvious that career paths become more important. As Chris Benner does in his SWET analysis of call centers in South Africa, I also use Arthur et al.'s understanding of careers as the series of work-related experiences within a person's lifetime (Benner 2006, Arthur et al. 1989). Due to constantly changing employers, jobs, and occupations (a lot of software developers have had different jobs before starting to work as software developers) it is important to pay close attention to career paths of individual employees. Because people change their jobs and occupations more often than previously, empirical information about the developments of jobs and occupational structures does not provide sufficient answers regarding current changes. Today, the development that a person needs and experiences must be considered more closely. Because workers change their jobs, occupations, and

employers more regularly than 30 years ago, looking at the empirical, quantitative development of jobs and occupations without considering who performs the job does not provide enough information of the actual changes. Working at McDonalds as a high school student, for example, has different implications than working there as middle-aged women. All in all, looking at careers as understood by Arthur et al. (1989) can give more important information about the consequences of labor flexibility and the impact of ICT than just looking on the quantitative development of labor time.

Concerning economic trends related to time, among the issues that need to be addressed within the IT industry and concerning software developers specifically are the number of turnovers and the high level of temporary employment. In addition, the decrease of labor time during an individual's lifetime needs to be studied in detail. High turnovers, a high level of temporary employment, and a decreasing volume of work are all indicators of increasing flexibility on an economic level. A comparison between US and German data gives information on how influential the different institutional frameworks are or if we can witness a more global trend concerning these developments.

Conclusion

Although the dimensions of space, work, time, and employment are separated for the purpose of analysis, they are in reality not always distinguishable from each other. As Chris Benner already pointed out, these four dimensions are inter-related (Benner 2006). Nevertheless, analyzing them separately is helpful to understand the various changes and processes involved in the shifting nature of labor.

I apply the SWET analysis to the development of the IT industry and software developers. Because the increasing influence of ICT on labor is most obvious in that industry, changes within the labor process of informational capitalism are most likely obvious and current within that industry. Within the SWET analysis my particular focus lies in aspects of flexibility. In each of the dimensions I am particularly analyzing the role of flexibility and with that I try to point out recent developments within the flexible labor process.

2.3.2 IT Industry and Software Developers

To research labor flexibility within informational capitalism it is reasonable to observe processes within the IT industry and for software developers. There, aspects of

informational capitalism should have the most developed impact. Quantitative empirical material on the development of the IT industry in general and about the development of labor in particular should give information about general trends of flexibility, especially concerning the dimensions of employment and time. I am considering the development of the IT industry in both the United States and Germany using national data and data gathered in quantitative empirical socio-scientific studies. However, some trends that are important when considering labor flexibility in informational capitalism, for example the changing role of communication, organization, and nature of work, are probably not evident in quantitative data. Therefore, I am also looking into qualitative aspects of the changes, which can be found when looking more closely at changes within a specific profession. I choose to look at the occupation of software developers and will elaborate this decision in the next paragraph.

To look for specifics of labor flexibility in informational capitalism I have concentrated my research on looking at the profession of software development.[37] Software developers are the "protagonists of the information economy" (Hartmann 1995, 1). Even after the burst of the tech bubble this statement is still reasonable, because this occupation is intensively faced with innovations in the area of ICT and with other processes within informational capitalism. A software developer writes programs for computers. Some software developers are specialized and some have general knowledge of multiple software programs. Sometimes software developers are also called software engineers, software analysts, or simply programmers. In the following I am going to use the terms synonymously. The quantitative data will address all variations of that occupation. The individuals I interviewed, however, belong to the group of software developers whose job requirements are rather complex, and whose tasks are not restricted solely to routine programming. Therefore, they belong to the category of the "knowledge workers," rather than just being part of the new group of "routine workers" in the sense of how Robert Reich defines a big group of software programmers. In general, the work of software developers can be characterized as highly skilled technical work. The work involves a tremendous amount of information processing. It is usually described as being highly flexible work performed under mostly highly flexible employment conditions. Software developers are one of the professions

[37] The qualitative interviews were conducted among that group and I have tried to include studies about that group. Sometimes I refer to empirical results from other occupations if they address my particular research question.

that grew enormously important during the rise of the New Economy. In general, "expertise in IT depends both on formal knowledge, that is generally acquired in the context of formal education and on situated knowledge that is specific to a work or problem situation" (National Research Council (US) and Committee on Workforce Needs in Information Technology 2001, 4).

I am looking at the development of the labor market performance of software developers in particular, because I argue that software developers experience changes in labor that are characteristics of informational capitalism. The profession of software developers is especially apt for this investigation because it is both involved with information processing issues and typically a very flexible profession. So, it is a profession that is highly involved in recent changes. Software development is one of those tasks that has been very much shaped by the process that accompanied the growing intensity of working with ICT. The impacts and changes that can be observed in labor flexibility should be closely connected with the important role of ICT.

The following are aspects that I will be analyzing regarding the changing labor process of software developers within informational capitalism: important role of ICT, general economic development of the IT industry, the changes in education structures in the IT field, changing values, and needs of employees. The fact that I am focusing my analysis on the IT industry and at software developers, does not mean that the results are limited only to that specific area. There are numerous hints that the developments are not restricted to the IT industry and to software developers. Analyzing the changes that affect software developers will be particularly important when considering the development of flexibility within the dimensions of space and time.

In addition to secondary information about the development of IT workers and in particular the software developers' profession, I collected empirical data in interviews. In total I talked to twelve software developers within four different companies in two countries.[38] Although, the interviews are not definitive or comprehensive in representing the profession, they are very helpful to get an impression of the current and previous conditions in the software industry and in particular to gain insights into the profession in the United States as well as in Germany. To understand current changes within the labor process it is crucial to get an impression of workers' personal experience. Even though a lot more occupations are involved with a high percentage of work with modern ICT, focusing on software developers is helpful,

[38] The companies and interviewees will be introduced in part II of this study.

because the occupation is pretty well-defined and much of the work of the software developers directly deals with technology, knowledge, and information. The interviews augmented information about the current situation of software developers that is not available from the quantitative data. Most valuable is the information that the interviewees can provide about how they personally deal with the changes.

2.3.3 Comparative Study: USA and Germany

Labor Market Distinctions between the United States and Germany

I am conducting the SWET analysis about software developers and about the IT industry in the United States as well as for Germany.[39] The United States and Germany represent polar economic conditions. Scott Lash and John Urry illustrate the differences between the United States and Germany as follows: "… neo-liberal America and corporatist Germany come closest to representing the two polar ideal-types of post-organized capitalist social structure" (Lash and Urry 1994, 190).[40] In general, the US economic model is referred to as the free market economy, whereas the German economic model is labeled the social market economy. Another important distinction between Germany and the United States is the fact that the US economy is more and more based on services, whereas Germany's economy is still very much based on production. In addition, a lot of the services in Germany are closely connected with the production industry and are therefore called production-based services. This issue is particularly relevant regarding the employment systems in both countries (Castells 1996). Concerning labor flexibility, both countries also represent opposite models with the United States having a highly flexible, deregulated labor market and Germany having, allegedly – even within the European Union – one of the most inflexible of labor markets.[41] In addition, in economic fields other than the labor market, the United States stands for a high degree of deregulation whereas Germany is known as a country with a high level of regulation.

So, if there is some broader universal force shaping flexibility, we should see it emerging in both countries. Similar processes occurring within different frameworks

[39] Comparing my findings from Germany to the process in the United States is possible, because I had the opportunity to visit the United States for an extended period of time during my research, so that I was able to both talk to American software developers personally and in addition, had great research facilities and advice about sources concerning secondary empirical research material about the US developments.
[40] With that they justify focusing on the United States and Germany when analyzing new lower-class formation in organized capitalism (Lash and Urry 1994).
[41] Chapter 3 presents some indicators of the labor market situations in the United States and Germany.

point to changes on a global level. To the extent that policies, politics, governmental structure, and country-specific business organization affect flexibility, however, it should be apparent in the comparison.

Different Pre-conditions concerning ICT in the United States and Germany

Both countries show differences in the role of ICT. The United States is an early adopter of the Internet and has the largest globally integrated economy with high Internet usage. As Manuel Castells points out, discoveries of new information technologies were gathered mostly in the United States during the 1970s (Castells 1996, 50). Therefore, he sees American people and organizations as origins of the information technology revolution. In 1995, he predicted a sustained leading role for the United States in the expansion of the revolution (Castells 1996, 53).[42]

In contrast, Germany was slow to follow the trend of modern ICT. An example of that condition is the 1994 statement of the then-chancellor Helmut Kohl who, when asked a question about the dismantling of the information highway (German: "Datenautobahn"), answered as if the question had been about the extension of German highways (German: "Autobahnen") apparently unaware of the development of modern ICT at that time. Another indicator of the relatively elementary influence of ICT on German workers is the below-average level of working with computers, with only 4.4 percent of all employees working with computers all the time in 2000, compared to 19.4 percent in the United Kingdom and 23.0 percent in the Netherlands (European Foundation for the Improvement of the Living and Working Conditions 2005).[43]

All in all, I will focus on the differences and similarities in the changes in both countries. With that I hope to find specific and similar trends in the development of flexible labor in the United States and in Germany. If a certain trend is visible in the United States and not in Germany, this might be a sign that it will eventually be relevant in Germany as well. Also, when findings are similar, this could represent a rather global and, from the specific institutional preconditions in both countries, independent trend. In addition, some changes might work better in the United States; while others might be

[42] In fact, Castells already acknowledged the increasing presence of other countries in that process in 1995. With that, he was not mistaken. Even though the United States is still playing a leading role concerning ICT development, other countries contribute important innovations as well. Other countries that play a leading role concerning a highly developed IT infrastructure and diffusion as well are South Korea, Singapore, Taiwan, and Finland. In addition, Japan, China, Europe and India play a leading role concerning new innovations of ICT.

[43] Recent data was collected in the end of 2005. The data of that survey has not been published yet (as of 08/07/06). It can be followed up under http://www.eurofound.eu.int/ewco/surveys/.

better dealt with in Germany. So there should be possibilities to learn from each other – even when keeping the very different frameworks for the changes in mind.

2.4 Concluding Remarks

Two dominant trends in the economic developments during the last decades can be described. First is the increasing importance of the global financial markets. Second is the growing dominance of globally operating enterprises. These trends and their consequences are best described with the concept of "informational capitalism" that was introduced by Castells (1996). These developments and their consequences form the background of this social scientific study, which especially focuses on a trend that has been part of these developments, the increasing flexibility of labor.

When referring to the term flexibility it is important to keep in mind that it indicates a reaction to a change. Thus, labor flexibility expresses a reaction to changes within the labor process. Labor flexibility is a neutral concept, including positive as well as negative outcomes when actors of the labor market adapt to the change.

Flexible labor within the dimensions of employment and time has been subject to many social science studies for a long time. Definitions of employment and time are sometimes rather narrow, with the result that outcomes and forecasts include only specific aspects of the changes within employment and time. Flexibility within the dimensions of work (not employment) and space are not yet investigated much. In my study I try to show that it is important to consider flexible developments within all four dimensions, because the consequences for the society and individuals are important but vary across those dimensions. Flexible labor has quantitative as well as qualitative aspects that need to be considered.

Looking closely at developments within the IT industry and for software developers is reasonable, because, first of all, software developers perform highly skilled work with a high amount of information processing. Second, data are available concerning the questions I am considering. Third, the IT industry is a rather young industry that incorporates a relatively sensitive reaction to general economic changes. Additionally, trends in that occupation and industry give hints of similar developments in other industries and occupations, as information processing and ICT become more and more important elsewhere.

The US labor process and labor market represents a very flexible, deregulated structure. In contrast, Germany's labor processes and labor market are characterized as

being rather inflexible. Yet, both countries are economically leading countries. Comparing the developments in the United States and Germany is fruitful because when similar trends are identified within different frameworks, this points trends taking place on a global level. In addition, there are no studies that address flexible labor including quantitative as well as qualitative data of *both* countries at the same time.

The goal of this study cannot be to give a complete and empirically validated picture of flexible labor within informational capitalism. Rather, I try to give insights into the complexity of current developments, an idea of how and why changes in labor within informational capitalism are different from earlier periods, and more important, what results from these changes. Both, quantitative and qualitative empirical data plays an important role. Pointing out gaps within the existing research will be one of the tasks of this study.

3 US American and German Labor Market Situations

The purpose of this chapter is to give a general picture of differences between the US American and German labor market situation. This background information will be valuable for the more detailed theoretical and empirical analysis of flexible labor development presented in the following chapters 4 to 7.[44]

3.1 Employment Development

The *US population* and the US poplutation 16 years and above grew considerably during the last 30 years. From about 205 million (137 million 16 and above years) in 1970, it increased to about 300 million people (226 million 16 and above years) in 2005 (www.bls.gov) [

Figure 3.1-1]. In contrast, the *German population* and the German population 15 years and above increased only slowly from about 61 million (47 million 15 and above years) to about 63 million (53 million 15 and above years) before the reunion and to about 82 million (70 million 15 and above years) after the reunion (www.destatis.de) [Figure 3.1-2].[45]

Two main factors are responsible for the difference in population growth. First, the United States experienced a much greater amount of immigration. Since the 1960s immigration into the United States has constantly increased. In 2004, the immigration rate was 3.41 immigrants per 1,000 population (http://usa.usembassy.de/travel-facts.htm). Since the reunion in 1991, the total annual average of immigrants into Germany was about 200,000, which is about 2.7 immigrants per 1,000 population (Statistisches Bundesamt 2003, 23). Second, the birth rate in the United States is considerably higher (2.06 compared to 1.38 in Germany) (Statistisches Bundesamt 2003, 16).

Not only the US population 16 and above, but also the US *employment* grew considerably and steadily from about 78 million to about 142 million during the last 35 years [Figure 3.1-1]. The ratio of population to employment grew from 57 percent to 63

[44] As much as possible I provide the same kind of data for specific topics for both countries. But the official statistical material sometimes does not provide specific information. The impression of similarities and differences should be visible for all provided topics anyway.
Most of the data from the Bureau of Labor Statistics (www.bls.gov) and from the German Federal Statistic Office (Statistisches Bundesamt) (www.destatis.de) was conducted in the first half of 2006. All values used to produce the presented figures are given in data tables in the appendix.

[45] The given US data show the civilian noninstitutional population, that is the population 16 and above that are not inmates of institutions or on active duty in the Armed Forces. Because the labor force in Germany is defined as the population above 15 years the given German population data show the data from the population 15 and above.

percent between 1970 and 2005 (www.bls.gov). In Germany, the employment also did not increase much between 1970 and 2005 (with the exception of the gain due to the reunion). There were about 27 million employees in Germany in 1970 and about 39 million employees in 2005 [Figure 3.1-2].[46] During this period the proportion of employed to population almost remained the same, at 57 percent in 1970 and 56 percent in 2005 (www.destatis.de).

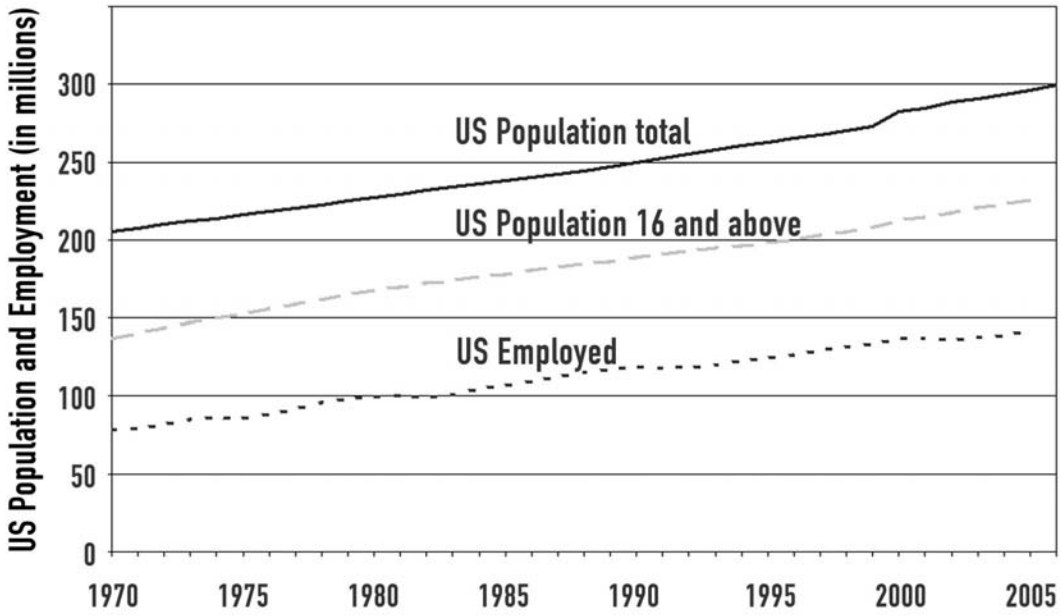

Figure 3.1-1: Population and Employment, United States 1970–2005 (www.bls.gov)

[46] These are the figures according to the national accounts (Volkswirtschaftliche Gesamtrechnung). According to the microcensus (Mikrozensus) there were about 25 million employees in 1970 and about 40 million in 2004 in Germany.

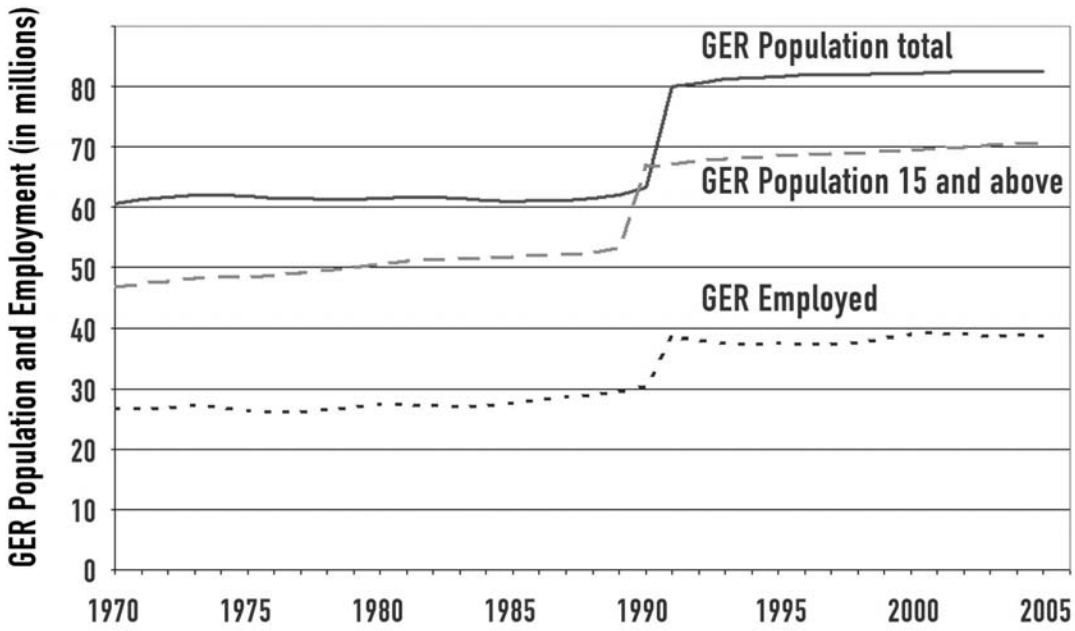

Figure 3.1-2: Population and Employment, Germany 1970–2005 (www.destatis.de)

In 2005, according to the US Bureau of Labor Statistics the civilian labor force is 66 percent of the total population. The US civilian labor force includes employed and unemployed people 16 years of age and over. It is also called the active population. The German civilian labor force participation rate[47] slowly increased from about 57 percent in 1970 to about 60 percent in 2005. From 1970 to 2005 the gap between the US and German rates doubled from about three to about six percent [Figure 3.1-3].

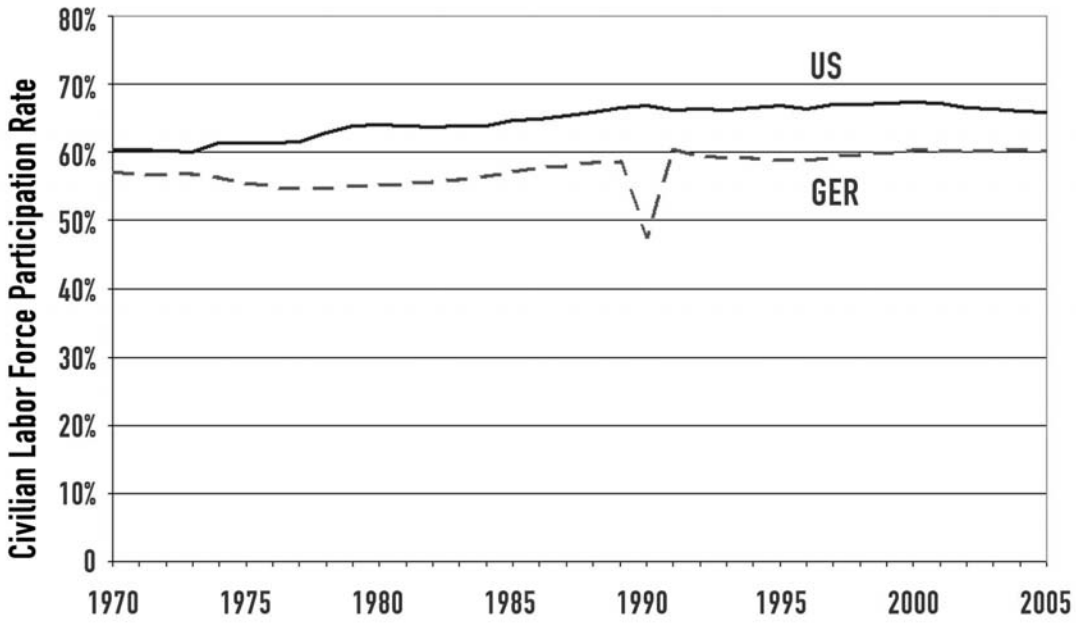

Figure 3.1-3: Civilian Labor Force Participation Rate, United States and Germany, 1970–2005 (www.bls.gov and www.destatis.de)

[47] The US civilian labor force participation rate is the labor force as a percent of the civilian noninstituionale population (www.bls.gov). In order to best compare the figures the German civilian labor force participation rate was calculated with the labor force ("Erwerbspersonen") as a percent of the population 15 and above.

According to the occupational status there is a continuous increase in private employment during the last 35 years in the United States. We find a steady increase of the US public wage and salary workers on a relatively low level. The US Bureau of Labor Statistics refers to all government employees as government wage and salary workers. The number of self-employed constantly rose in the United States since 1970. Unpaid family workers played a small role in the US labor market during the entire period (www.bls.gov) [Figure 3.1-4].

Figure 3.1-4: Employment According to Occupational Status, United States, 1970–2005 (www.bls.gov)

In Germany employment also increased, but since the German reunion the increase has been rather slow compared to that of the United States. In addition, there has been a little decline of private employment since the beginning of 2000. Since the beginning of the 1990s the number of laborers declined constantly. There has been stagnation of public employment basically over the past 30 years. After a decline during the 1970s, the number of self-employed in Germany has continued to rise. The numbers of unpaid family workers, public officials, and self-employed workers did not differ substantially during the 1970s. This has changed considerably. Today, there are few people in the group of unpaid family workers in Germany (www.destatis.de) [Figure 3.1-5].

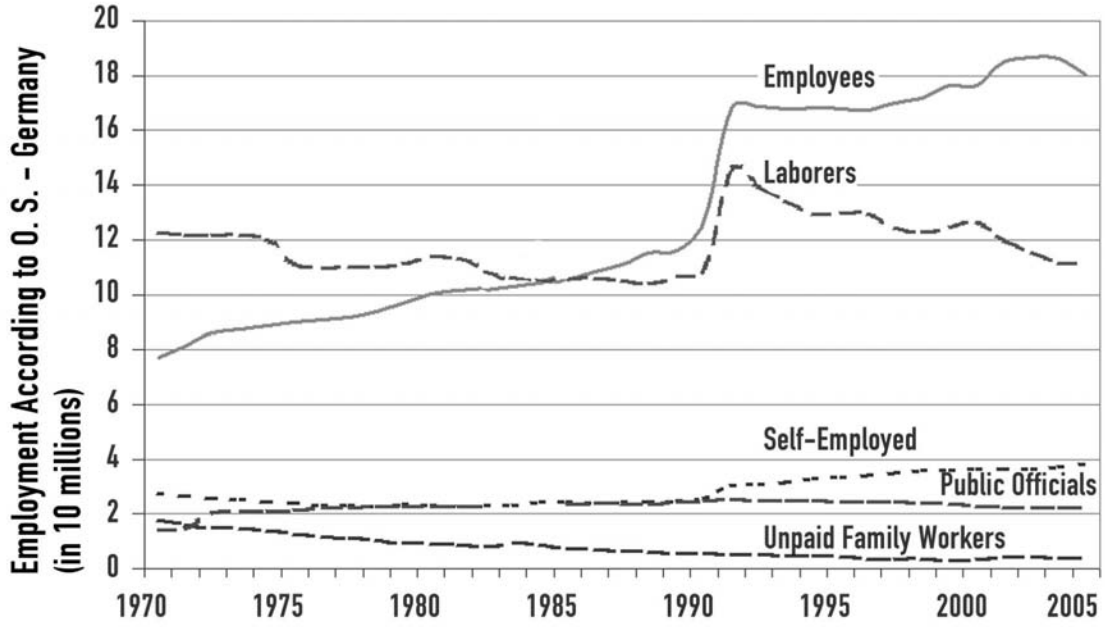

Figure 3.1-5: Employment According to Occupational Status, Germany, 1970–2004 (www.destatis.de)

The development and current role of public employees and unpaid family workers are comparable concerning their relatively low level in the United States and in Germany. The development of private employees, instead, is rather different. In the United States, a continuous growth of private employees can be observed. In Germany, this development is reproduced in two different categories: laborers and white-collar employees. The number of laborers declined over the years and the number of private

white-collar employees plateaued since at least the beginning of the 1990s, with a slight increase at the beginning of 2000, but declining again after 2003.

Since 1970 the lowest unemployment rate in the United States has been 4.0 percent in 2000. Since 1970 the lowest German unemployment rates of 0.7 and 0.8 in 1970 and 1971 have never been reached again. Since that time the unemployment rate has grown almost constantly in Germany. The highest unemployment rates for each country have been 9.7 percent in the United States in 1982 and 12.7 percent in Germany in 1997. Since 1982 the unemployment rate in the United States was almost in constant decline, being only 5.1 per cent in 2005. Since 1994 the unemployment rate in Germany has never been below 10 percent, being as high as 11.7 per cent in 2004 (www.bls.gov and www.destatis.de) [Figure 3.1-6 and Figure 3.1-7].

The developments regarding unemployment and the current unemployment rates differ considerably between the United States and Germany. Germany had its lowest unemployment rate in 1970, whereas the United States had its lowest unemployment rate for the last 35 years only recently in 2000. In 2006, the German unemployment rate was more than twice as high as the American rate (12.0% vs. 4.6%) (www.destatis.de and www.bls.gov).

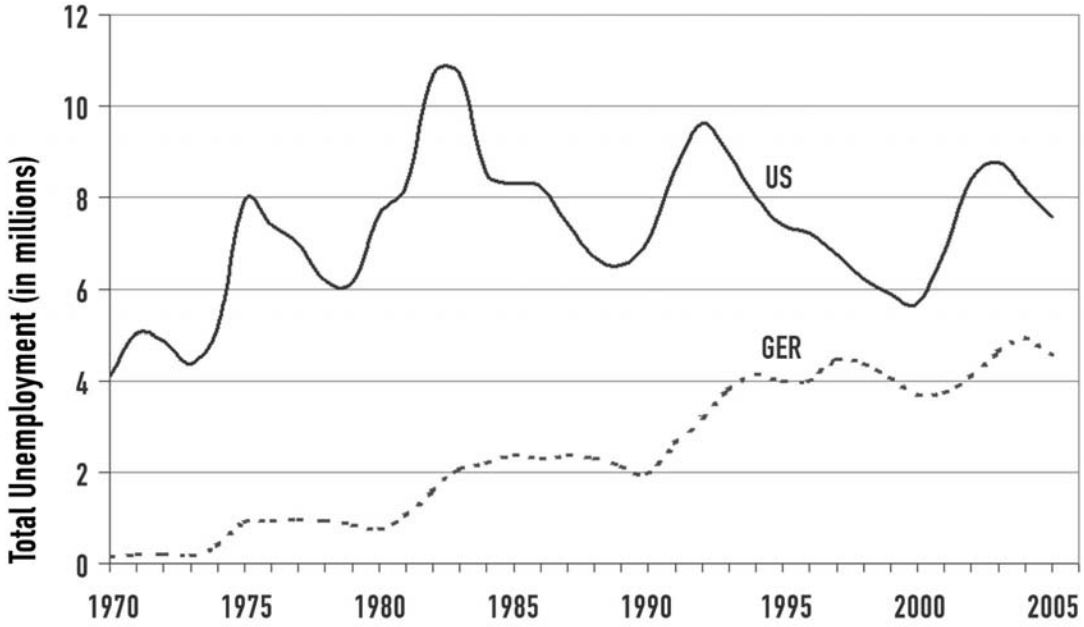

Figure 3.1-6: Total Unemployment, United States and Germany, 1970–2005 (www.bls.gov and www.destatis.de)

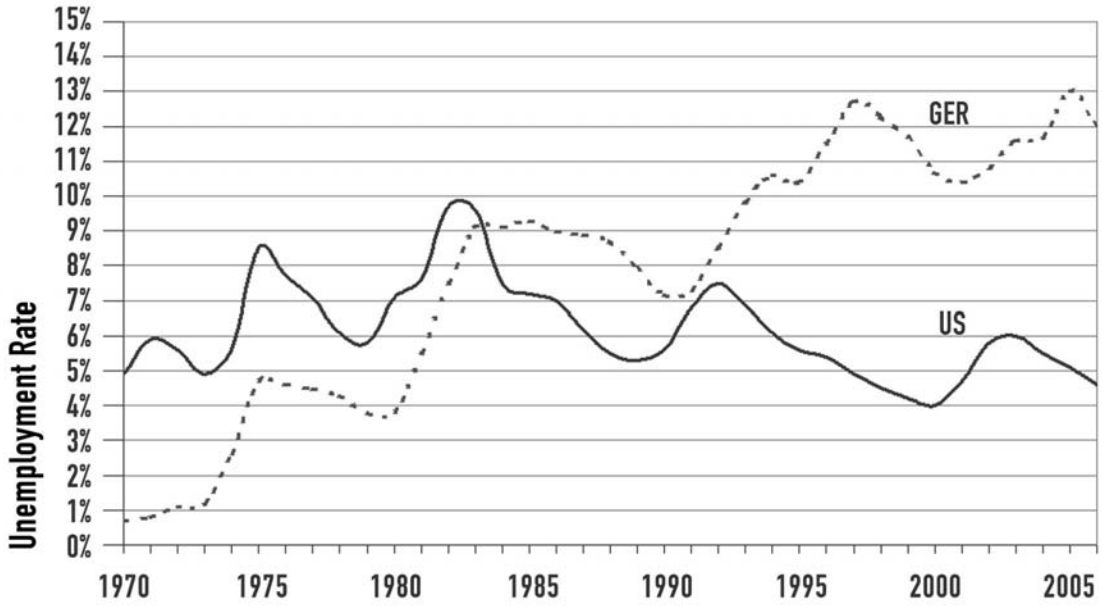

Figure 3.1-7: Unemployment Rate, United States and Germany, 1970–2005 (www.bls.gov and www.destatis.de)

In February 2004 the duration of unemployment in the United States was at 20.3 weeks, with an unemployment rate of 5.6 percent in February 2004. About 20 years earlier, the duration of unemployment was 21.2 weeks with an unemployment rate of 9.9 per cent (Price 2004).

In 2004, the average duration of unemployment in Germany was 38.1 weeks, which is almost twice as much compared to the duration of unemployment in the United States. The men's duration of unemployment (2004: 36.0) was somewhat lower than that of women (2004: 41.4). In Germany, 38.4 percent of the unemployed were long-term unemployed in 2004. Since 1998 the duration of unemployment has ranged at about the same level. Only the duration of unemployment of men increased, while that of women decreased slightly (Institut für Arbeitsmarkt- und Berufsforschung (IAB) 2004). All in all, the long-term unemployment in Germany is considerably higher than in the United States.

To explain the relatively high unemployment rate in Germany, many social scientice studies refer to the relatively high amount of the so-called *working poor* in the United States compared to a relatively low percentage of working poor in Germany.

However, a recent German study suggests, instead, that the ratio of working poor among all employees is as high in Germany as it is in the United States (Strengmann-Kuhn 2003).

In 2003, 5.3 of the Americans who have been in the labor force for 27 weeks or more were classified as working poor. The proportion of working poor had been the highest in 1993 – at 6.7 – and declined to the lowest point in 2000, at 4.7. Since then the rate rose again to the above-mentioned 5.3, which remained stable compared to 2002. More women belong to the group of working poor than men (6.0 vs. 4.7 per cent). Young people are more likely to be working poor than older people, and workers in jobs that require less education are more vulnerable to become working poor than those in occupations that require higher educations and that are characterized by higher earnings (US Department of Labor and US Bureau of Labor Statistics 2005).[48]

A well-written qualitatively oriented report on the working poor in the United States was published by Barbara Ehrenreich, who herself became one of the working poor trying to survive on several different low-wage jobs. Her book is based on her own experience during her experiment. She strikingly describes the severe conditions many Americans face working in low-wage jobs (Ehrenreich 2001). David Shipler recently published a book about the working poor which is based on a lot of interviews with working poor. One of his main statements is that work does not help to prevent poverty. The reasons for being among the working poor are manifold. Shipler sees individual as well as institutional causes (Shipler 2004).

In Germany, the issue of working poor has long been neglected in social science research. Only recently have social scientists turned to that topic. In 2003, Strengmann-Kuhn published the first monograph on working poor in Germany (Strengmann-Kuhn 2003). His results diverge from general presumptions. He disproves the assumption that poverty does not exist along with employment. In Germany, 5.4 per cent (based on data of the The German Socio-Economic Panel Study [SOEP]) or 5.5 percent (based on the Microcensus) of the employed belong to the working poor. This is about two million people, compared to about one million unemployed who are considered to be poor. The composition of the group of working poor also differs from common opinions that are based mainly on the notion that the contingent and precariously employed belong to the

[48] The data on working poor was collected in the 2004 Annual Social and Economic Supplement to the Current Population Survey.

working poor. Instead, the employed persons with a standard employment contract have the highest share of the group of working poor with 43.1 percent, followed by 30 percent with a precarious employment condition, 15.6 percent being self-employed, and 11.8 percent in apprenticeship programs. Contrary to the US data Strengmann-Kuhn shows that more men than women belong to the group of working poor in Germany. On the basis of Microcensus, 42.4 percent of women belong to the working poor. This is the same ratio of women in employment generally. Using the data of the German Institute for Employment Research (IAB) employee sample, Schäfer reaches similar conclusions. He also finds a considerable proportion of working poor among those employees with a standard employment contract (Schäfer 2003).

Considering these data, the United States and Germany have about the same ratio of working poor.[49] This is especially remarkable with respect to the fact that the high unemployment rate in Germany is often excused with the argument that in the United States the relatively low unemployment rate exists at the expense of the supposedly higher ratio of working poor.

In the United States the average monthly income (monthly wages per employee) rose from US $2,529 in 1997 to US $3,280 in 2004. This corresponds to an average hourly wage of US $15.09 in 1997 to US $18.09 in 2004 (www.bls.gov). In Germany, the average monthly income for all employees was 2,909€ in 2003. Blue-collar workers on average earned 2,460€ and the average monthly income for white-collar workers was 3,736€ (Statistisches Bundesamt 2005a).[50] Taking this data into account, Germans, therefore, currently earn more than 10 percent more than Americans.

In the United States, the gender wage ratio has again almost reached its all-time high of 76.5 percent in 2004 previously reached in 2002 (76.6 percent). The rise of women's wages has slowed down since the early 1990s. In 2004, year-round and full-time working women earned 76.5 percent of the men's wages.[51] The median earnings

[49] Yet, the income mobility (the chance of reaching a higher income level) is greater in Germany than in the United States, as will be presented later. Also, the ratio does not say anything about the level of being poor in both countries. The definition of "poor" differs considerably between the United States and Germany.

[50] Based on the exchange rate from December 31, 2003 2,909€ are US $3,653, 2,460€ are US$ 3,089, and 3,726€ are US$ 4,691.

[51] This difference would be much higher if part-time and part-year workers would be included, because those groups have many more women than men.

for women was $31,223 and for men was $40,798 (Institute for Women's Policy Research 2006).

In Germany, there is a similar situation. Regardless of which data are considered, German women earn at least 20 percent less than men do, when working about the same amount of time. In 2002, Eastern German women earned as much as 92 percent of the men (full-time employment only). But in Western Germany, the income of women only reaches as much as 76 percent of the income of men. Therefore, the Western German situation is about the same as the situation in the United States concerning the gender wage ratio. Regarding part-time employment, German women earn more than German men. But the number of men working part-time is very small and the amount that is being earned in part-time employment is very low, too. Therefore, the income of female employees is still considerably lower than that of men. The average gap between full-time employed men and women has stayed at about the same level over the last several decades. However, the gender-specific income differences in certain occupations is striking. Female public officials and self-employed women come closest to men's income, at 87 per cent. Female white-collar employees earn only 70 percent of men's income and female blue-collar workers earn only 67 percent of the men's income (Deutsches Jugendinstitut e. V. (in Zusammenarbeit mit dem Statistischen Bundesamt) 2005).

Overall, the gender wage ratio is similar between the United States and (Western) Germany. This is also notable because the German gender wage ratio ranks, together with Austria and Great Britain, among the lowest when compared to the other States within the European Union.

A recent study of the Economic Policy Institute shows a growing income inequality in the United States since the 1980s. Even though the income inequality declined after the burst of the tech bubble from 2000 to 2003, the inequality grew again after that (Spillane and Coleman 2006). Between 1980 and 2003 the percentage change of average income of the bottom fifth of families in the United States was 18.9 per cent whereas it lay at 58.5 per cent for the top fifth of families. The inequality gets even more obvious when comparing the percentage of the top 5 percent to the bottom 20 percent of families. Their average income grew by 84.7 percent over the period between 1980 and 2003 (Bernstein et al. 2006).

The income inequality in the United States is much larger than in Germany, where the income distribution is much more egalitarian. This is visible taking into account three different indices measuring income inequality. The difference in income mobility between the United States and Germany does not lead to an equalization of inequalities. Looking at the relative persistence (*R*) it even becomes obvious that the income dynamic in the United States is not considerably higher than that of Germany. In contrast, it is at about the same level. The high persistence of income inequality in Germany suggests a sustained closing of the German social structure. There is a lower income inequality and lower income mobility in Germany than in the United States, but the relative degree of leveling of inequality over time is about the same [view Table 3.1-1] (Gangl 2005).

		INEQUALITY DEGREE		
		Gini	MLD	Theil
UNITED STATES	Yearly income	0.338	0.224	0.215
	Average income	0.307	0.167	0.172
	Relative persistence *R*	0.908	0.746	0.800
GERMANY	Yearly income	0.251	0.115	0.113
	Average income	0.226	0.086	0.091
	Relative persistence *R*	0.900	0.748	0.805

Table 3.1-1: Income Inequality Level and Persistence, United States and Germany (Gangl 2005, 247)

Concerning the income mobility across the employment process ("Erwerbsverlauf"), the figures for the United States and Germany are at about the same very low level (0.2 versus 0.1). The individual incomes are fundamentally instable in the United States (transitory income variance of 0.127). In Germany, individual incomes are rather stable, with a transitory income variance of 0.036. In the United States employees older than about 45 years have to deal with distinct income losses. In Germany, older employees cannot increase their living standard anymore.[52] In Germany, within the low-level income group, there is a high potential to increase income over time. This is not the case in the United States. The individual trend of income in the low-level income group is negative, whereas it is positive in the high-

[52] Compared to nine (other) European countries, the United States was the only country where older employees faced income losses, and Germany was the only country where older employees were not able to increase their living standard.

income group. The United States is the only country (compared to ten European countries) where the individual mobility of income leads systematically to a polarization of the social structure. In Germany, you find a clear leveling dynamic (Gangl 2005).

In the United States, the full-time employment rose considerably during the last 35 years, from about 67 million people in 1970 to about 117 million in 2005. Yet the percentage of full-time employment among all employees basically remained the same, even declining somewhat, from about 85 percent to about 83 percent. Part-time employment grew at a much lower level, from a little less than 12 million to about 25 million workers. The ratio of part-time employees among all employees also remained at a quite similar level, rising somewhat from about 15 to about 17 percent (www.bls.gov) [view Figure 3.1-8 and Figure 3.1-9].[53]

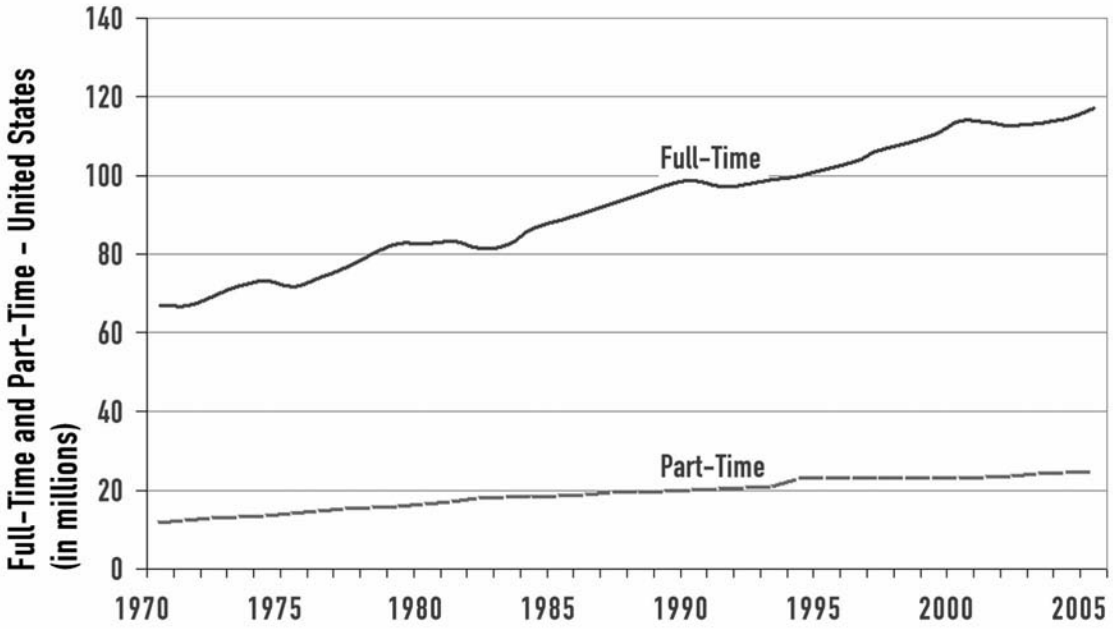

Figure 3.1-8: Comparison of Full-time and Part-time Employment, United States, 1970–2005 (www.bls.gov)

[53] Unfortunately, the long-term data available at the Bureau of Labor statistics does not give gender-specific information for the change in part-time employment over time.

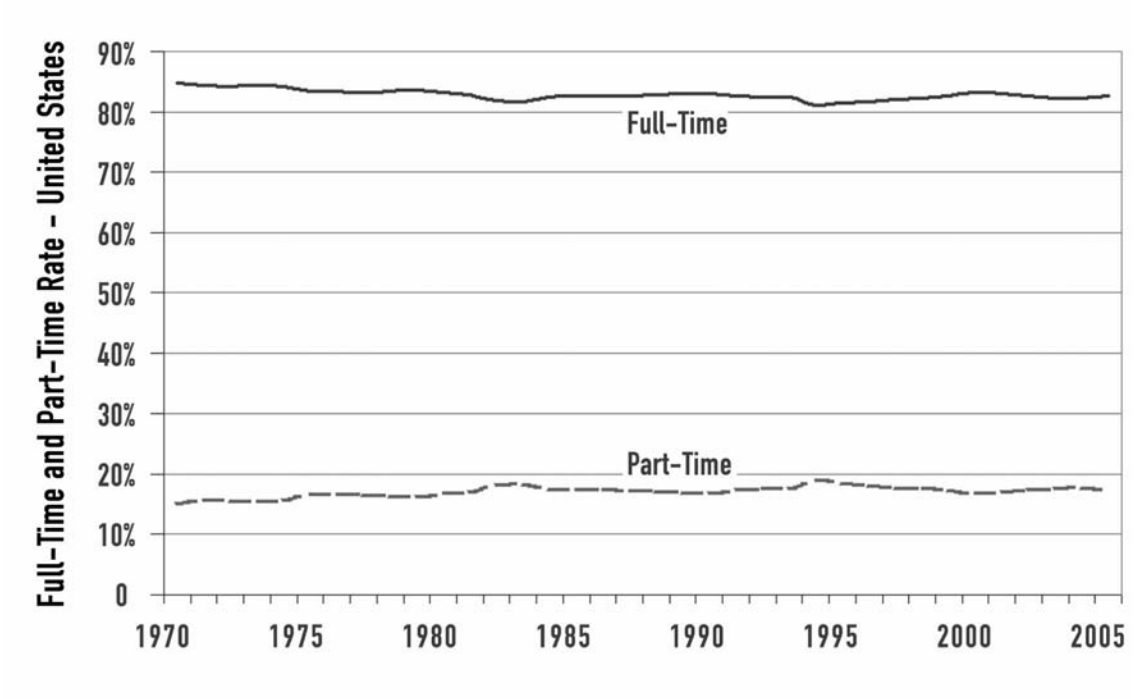

Figure 3.1-9: Comparison of Full-time and Part-time Employment in Percent of Employed Persons, United States, 1970–2005 (www.bls.gov)

The full-time employment of German men and women decreased steadily since the German reunion in 1991. It is at a significantly lower level for women (between 31% in 1985 and 35% in 2004) than men (between 69% in 1985 and 65% in 2004). Even though the part-time employment rose during the last 20 years for men, the number of part-time working women is still much higher and rose steadily during the last 20 years. The part-time employment among German men increased from 1.4 per cent to 6.6 percent from 1985 to 2004 while the part-time employment of German women increased at a much higher level during that same period. Starting out at 40.7 percent in 1985, it reached a level of 72.6 percent. The total ratio of part-time employment more than doubled from about 14 percent to almost 30 percent (www.destatis.de) [Figure 3.1-10 and Figure 3.1-11].[54]

The ratio of part-time employment differs between the United States and Germany. It stayed at about the same level during the last 35 years in the United States and increased considerably in Germany.

[54] These data are based on the Microcensus and include dependent employees (excluding self-employed).

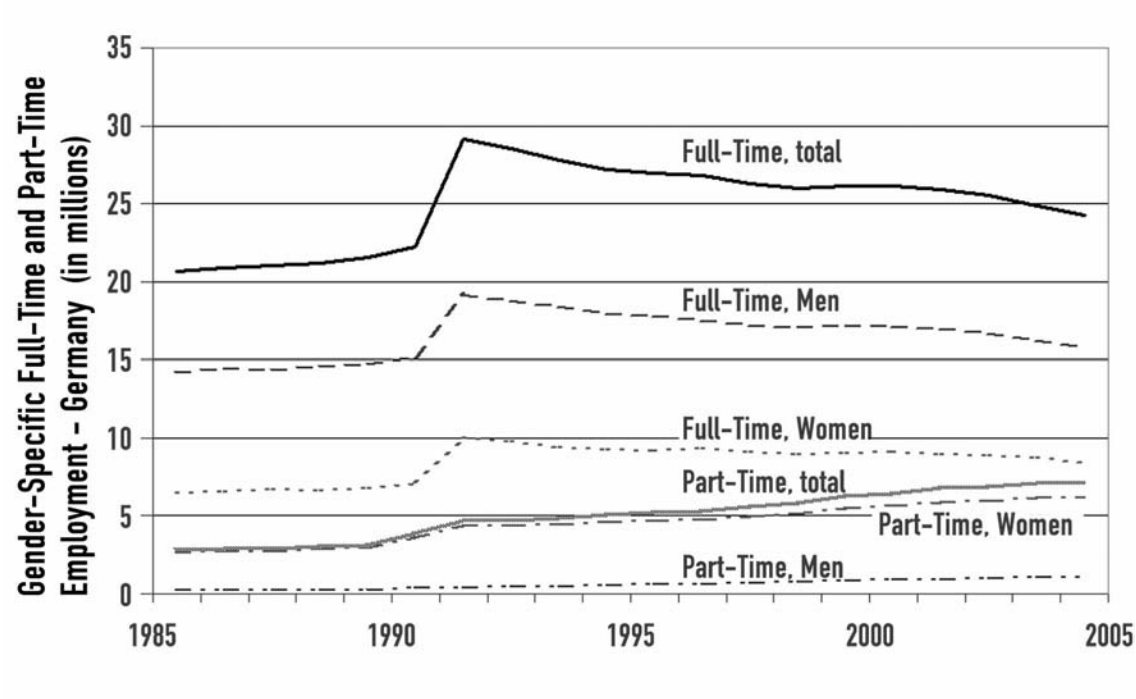

Figure 3.1-10: Gender-specific Full-time and Part-time Employment, Germany, 1985–2004 (www.destatis.de)

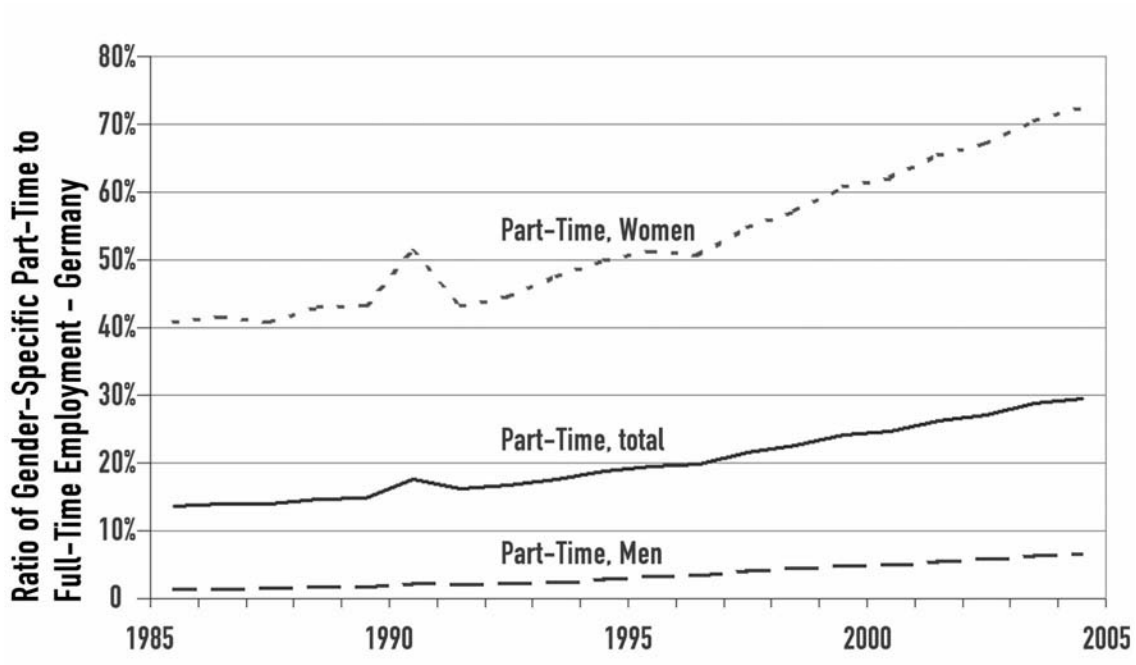

Figure 3.1-11: Ratio of Gender-specific Part-time Employment to Full-time Employment, Germany, 1985–2004 (www.destatis.de)

There is evidence of a loss of importance of the standard employment situation in almost all European countries. The reasons for that development are, thus far, not clear. There seem to be different kinds of reasons in different countries, such as an increase in unemployment, a change in employment preferences for certain employment groups, and institutional frameworks that might lead to a decrease in the amount of standard employment. More detailed and comparable surveys are necessary to be able to point out similarities and differences concerning the question why standard employment conditions lost its importance in specific countries (Hoffmann and Walwei 2000). Often, the value placed on individualization is given as an explanation for the increase in flexible employment conditions and a decline in standard employment contracts. A reasonable counter-argument was made by Allmendinger and Hinz (2002, 20),[55] who put forward the argument that individualization does not lead to a decline of standard employment as often assumed. They argued that the reason for the decline lies in a more intense differentiation of the employer-employee relationships. The differentiation takes place on the level of the organization rather than on the level of the individuals.

An indicator of growing temporary employment in the United States is the growth rate of staffing firms. Between 1979 and 1995 the number of these firms rose 11 percent annually. In nonagricultural employment the growth rate is five times slower. Also, between 1990 and 2000 ten percent of the net job growth was due to temporary help firms (Autor 2000a, 2000b).

The Current Population Survey collects job tenure information every two years. Although the data show a net effect of a mild decline in long-term tenure for both men and women, it is very different for men and women. Men's tenure, especially that of middle-aged men, is declining, whereas high-tenure jobs for women increase for several years [Table 3.1-2].

[55] Originally this argument was made by DiPrete (1993) and Haveman (1993) considering the US employment situation. Allmendinger and Hinz refer to their work.

	1983	1991	1996	2000
Both Sexes over 25	31.9 %	32.2 %	30.5 %	31.7 %
Both Sexes Age 40-44	38.1 %	39.3 %	36.1 %	35.9 %
Both Sexes Age 50-54	53.5 %	51.4 %	50.4 %	48.6 %
Men over 25	37.7 %	35.9 %	33.1 %	33.6 %
Men Age 40-44	51.1 %	46.3 %	41.7 %	40.4 %
Men Age 50-54	62.3 %	58.5 %	54.9 %	51.6 %
Women over 25	24.9 %	28.2 %	27.6 %	29.5 %
Women Age 40-44	23.4 %	32.0 %	30.4 %	31.4 %
Women Age 50-54	42.5 %	43.4 %	45.8 %	45.6 %

Table 3.1-2: Percent of Employees with 10 or More Years of Tenure with Current Employer [Source: Bureau of Labor Statistics. Cited in (Osterman 2004, 160)]

According to Osterman, the Bureau of Labor Statistics data about contingent jobs show that the percentage of people holding precarious jobs (meaning contingent jobs) has not increased during recent years (Osterman 2004, 160) [Table 3.1-3].

YEAR	PER CENT OF CONTIGENT JOBS
1995	3.9 %
1997	3.5 %
1999	3.3 %
2001	3.2 %

Table 3.1-3: Percent of Contingent Jobs [Source: Bureau of Labor Statstics. Cited in (Osterman 2004, 160)]

According to newer data from the Bureau of Labor Statistics, using the broadest definition of contingency, there were 5.7 million workers classified as contingent in February 2005, which accounts for 4 percent of total employment. Therefore, the amount of contingent workers seems to have risen enormously during the last four years and the importance of contingent work as therefore not decreased but increased. Moreover, 55 percent of contingent workers would have preferred a permanent job. The Bureau of Labor Statistics differentiates between contingent and alternative work arrangements. The latter belong to independent contractors (10.3 million, 7.4 percent of employment), on-call workers (2.5 million, 1.8 percent of employment), temporary help agency workers (1.2 million, 0.9 percent of employment), and workers provided by

contract firms (813,000 workers, 0.6 percent of employment). Contingent and alternative are not necessarily the same employment arrangements. For example, only 3 percent of independent contractors consider themselves contingent workers (US Department of Labor Bureau of Labor Statistics 2005).

About 13 percent work under a temporary employment contract in Germany in 2000. Slightly more women than men have a temporary employment contract. The majority of employees in temporary employment are younger than 30 years. Among those under 30 years with temporary employment contracts are more men, and among those above 30 years are more women (Franco and Winqvist 2002). In Germany, there is a group of marginally employed ("geringfügig Beschäftigte") who earn up to 400€ in one month. The majority working in this group are women. They are especially present in two industrial sectors: retail and services related to real estate. From September 2002 to June 2004 the number of marginally employed grew from about 4 million to about 7 million. More than half of them are women, although the percentage of men in these jobs is growing somewhat (Verdi 2006).

In 2003, the working time of full-time employed Americans was given between 36.8 and 42.3 hours per week, depending on what definition of paid work and what data are used as the source (Frazis and Stewart 2004).[56] In 2005, American workers worked 7.5 hours on an average day that they worked. They worked 7.9 average hours on weekdays, compared to 5.5 hours on a weekend.

The collectively agreed-on customary working time for full-time employees in Germany was 37.77 hours in 2001. For part-time employees this figure was 14.12 hours, which is 37.4 percent of the fulltime working time. The average working time of salaried earners therefore was (only) 31.41 percent (Bach and Koch 2003).

In Germany, the volume of work decreased from almost 61,000 hours in 1991 to almost 54,000 hours per person and year in 1997 and then increased again to about 54,500 hours per person in 2001. Still, there has been a considerable decline in the volume of work in Germany since the beginning of the 1990s (Bach and Koch 2003).[57]

[56] The BLS Current Population Survey (CPS) and the BLS Current Employment Statistics survey (CES) are the two major sources of work hours in the United States. There is a new American Time Use Survey (ATUS) which works with different methods and definitions. The definition of work hours ranges from "work only" (ATUS definition) to "start time minus stop time" (Frazis and Stewart 2004).

[57] Unfortunately, I was unable to find current statistical information on the volume of work of US employees. The Bureau of Labor Statistics does not provide information about it.

Considering this information, it stands to reason that Americans work somewhat more than Germans. It is not easy to compare these figures because the result depends very much on the definition of work time. In addition, the officially counted work time does not necessarily correspond with the actual time people spend working in both countries. The explanations concerning overtime illustrate this argument.

The changes in paid overtime fluctuated over the years between 1970 and 2006 in the United States. In 1970, the average weekly overtime was 2.9 hours. Going up and down during the following years, the year 1982 was characterized by the lowest average paid weekly overtime, at 2.3 hours. Since that time, the average weekly overtime hours basically increased to about 5.1 in 1997, but then decreased again. In 2006, the average weekly overtime was about 4.5 hours.[58]

In Germany, the amount of paid overtime decreased between 1970 and 2005 from 160 to 58 hours per year (3.1 to 1.1 hours a week). But this trend does not represent the actual performed labor time, because there is an increasing amount of overtime that is compensated with leave time or not compensated at all. Regardless of the form of compensation, between 1991 and 2005 overtime increased, for low-skilled blue-collar workers from 1.5 to 2 hours, for employed white-collar workers from 2 to 2.4 hours, and for high-qualified blue-collar workers from 1.8 to 2.3 hours a week on average. For high-qualified employed white-collar workers the amount of overtime hours stabilized at 2.9 hours per week. Not all workers perform overtime, but high-qualified employed white-collar workers have the highest portion of individuals working overtime, at 62 percent in 2005 (Anger 2006).

The presented data show a considerable difference between the level of overtime in both countries. Even taking the unpaid or otherwise compensated German overtime into account, the amount of overtime is almost twice as high in the United States.

These data give an impression of similarities as well as differences between the current situations in both countries. As expected, the differences exceed the similarities. The most important findings are summarized in the following table [Table 3.1-4].

[58] The real trend in overtime is not shown with this data, because one needs to consider the unpaid and otherwise compensated overtime as well. Unfortunately, I was unable to find current information about this topic. The official statistics collect data only about paid overtime.

	DIFFERENCES	
	UNITED STATES	GERMANY
Population growth	increasing	stagnating
Employment growth	increasing	stagnating
Civilian labor force participation	0,66	0,49
Number of private employees	increasing	white-collar: almost decliningblue-collar: declining
Number of public officials	increasing on a low level	stagnating on a low level
Unemployment rates 2006	4.6%	12.0%
Duration of unemployment	20.3 weeks	38.1 weeks
Income inequality	high	low
Individual income mobility	low	high
Part-time employment ratio	0,17	0,3
Paid overtime	4.5 h per week	1.1 h per week
Weekly working time	36.8–42.3	37.8

	SIMILARITIES
	UNITED STATES / GERMANY
Number of family workers	declining on a very low level
Income dynamic	about the same
Ratio of working poor 2003	about the same (US: 5.3; GER: 5.4 or 5.5)
Women income	similar (at least 20 percent less than men)
Situation of older employees	problematic (income losses vs. no potential of increase)

Table 3.1-4: Differences and Similarities Concerning US and German Labor Market

It is important to keep in mind that this quantitative empirical data might miss important in-depth information of current and past developments. The unemployment rate, for example, usually underestimates the real number of unemployed people, because not all unemployed are reported officially. Similarly, the data for overtime are only estimations. For example, only the overtime that was being paid appear in the official statistics. Overtime hours which were not paid do not appear there. Despite the problems in the explanatory power of the presented statistical information, it is valuable to give an *impression* of the different tendencies in the current employment situation in both countries.

3.2 Indicators of Informational Capitalism

Before turning to the developments in the IT industry and for software developers more closely there are some indicators that describe an overall picture of

informational capitalism. The authors referred to in this paragraph provide information on the information society on the one hand and on the knowledge society on the other hand. As already discussed it is rather questionable to talk about the "information and knowledge society," because information and knowledge have always been important for societal developments. But because the statistical information is given in these categories, I use this labeling and differentiation here to show some of the developments concerning ICT as well as knowledge production within a society.

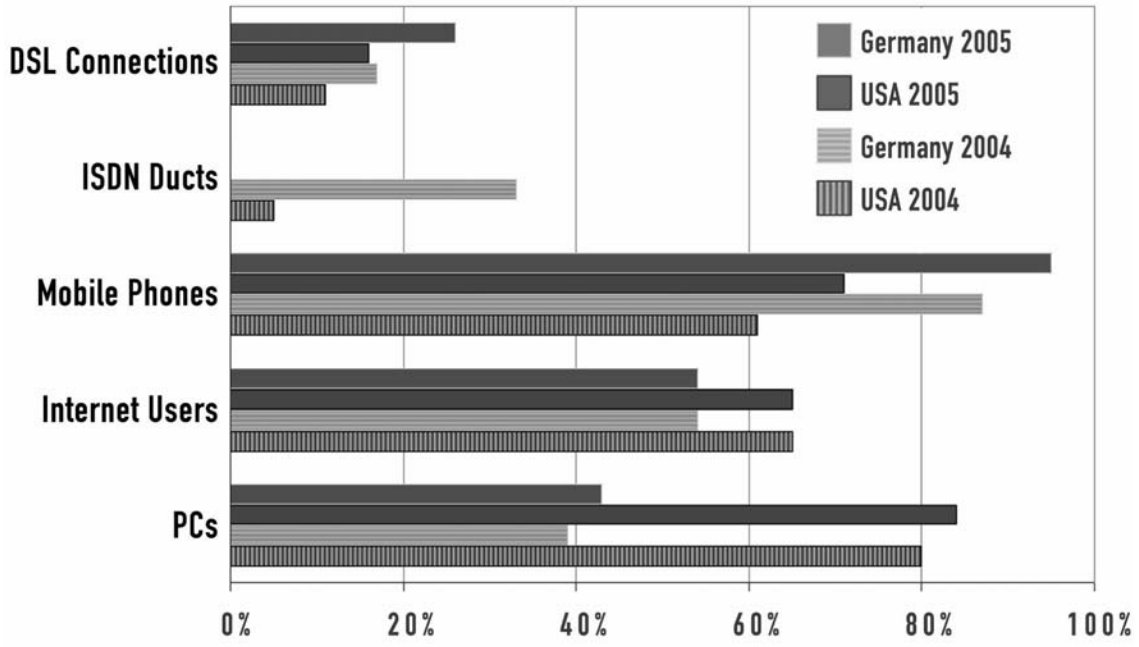

Figure 3.2-1: Indicators of the Information Society for the United States and Germany (2004: Institut der deutschen Wirtschaft Köln 2005, 152f.; 2005: BITKOM 2006a, 5)[59]

The indicators of the information society shown in Figure 3.2-1 basically illustrate the information technological infrastructure. The leading economic role of the United States and Germany suggests that these technological developments are rather high and equal in both countries. However, there are some significant differences that are worth mentioning when comparing developments in both countries. The United States, for example, is leading in the numbers of PCs and numbers of Internet users. Remarkable is the enormous difference of 84 to 43 per 100 inhabitants owning a PC. In contrast, Germany is clearly ahead concerning the diffusion of mobile phones, ISDN

[59] The amount of ISDN ducts was only available for 2004.

ducts and DSL broadband connections. Interestingly, the latter are the most recent developments in the information industry [Figure 3.2-1]. Concerning the total revenues of the ICT industry, the United States is slightly ahead. In the United States, this sector is 7.7 percent of the GDP, compared to 6.2 percent in Germany (Institut der deutschen Wirtschaft Köln 2005, 152-153).[60] The fairly low numbers of PCs owned by Germans and the quite low numbers of ISDN ducts in the United States are differences that point to different focuses concerning the promotion of technological developments.

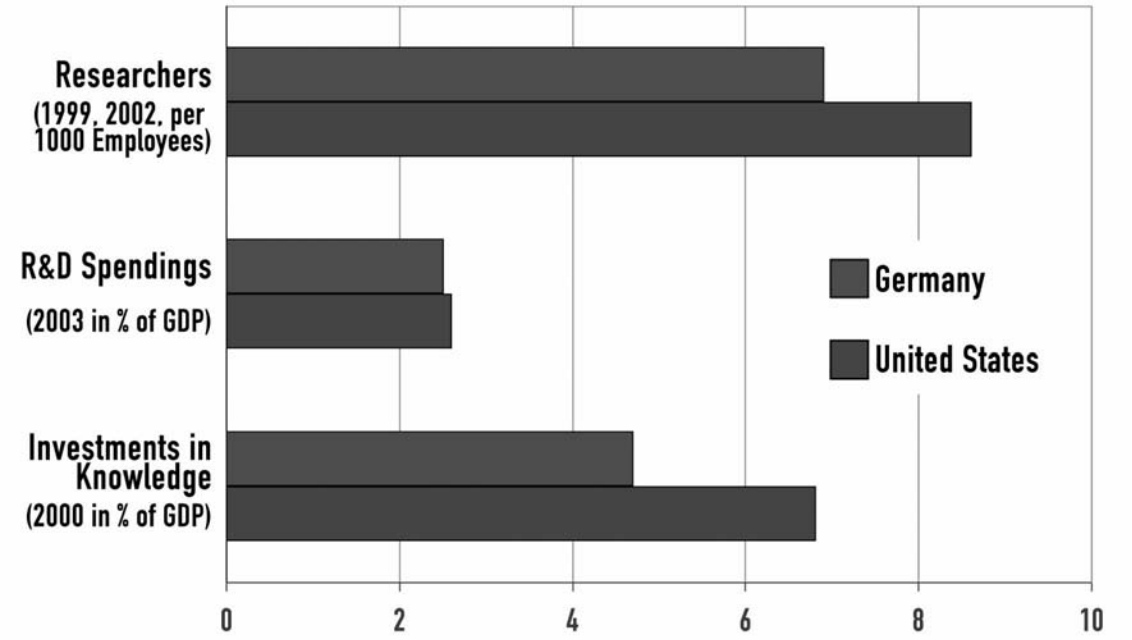

Figure 3.2-2: Indicators of the Knowledge Society for the United States and Germany (Institut der deutschen Wirtschaft Köln 2005, 152f.)

Regarding the indicators for the knowledge society, the developments are almost equal. As illustrated in Figure 3.2-2 the investments in knowledge and the number of researchers are somewhat higher in the United States. The R&D spending is almost equal. Another indicator of the knowledge society not included in the figure is the number of triad patents. Triad patents are patents that are registered in at least two foreign countries of the triad regions USA, Europe, Japan, in addition to the home

[60] The data source for the presented data was BITKOM.

country. The number of triad patents is a little higher for Germany – 277 per one million employees compared to 239 in the United States.[61]

3.3 IT Industry

It is important to keep in mind that speaking of the IT industry does not indicate speaking about IT jobs. Less than one-fourth of the jobs within the IT industry are IT-related occupations.[62] Therefore, developments of the IT industry show the changing conditions within that industry related not to IT-related occupations but also to more traditional occupations. The developments in the IT industry are still more intensively driven by innovations in ICT than other industries are. Therefore, an assumption can be made that changes in the labor process within the IT industry can be considered precursors for changes in the labor process of other industries.

In 2003, the US IT industry grew by 6.5 percent, compared to 1.6 percent growth in 2002 and 0.9 percent in 2001. The total output of goods and services in the IT industry was $1.24 trillion. The growth rate was twice as high as that of the overall US economy, which was about 2.9 percent. The hardware section of the industry had the biggest growth rate, at 26 percent compared to less than 2 percent in the sectors of communication services and software services. The spending in research and development grew in 2000 and 2001 after it had declined in 1998 and 1999. In 2001, $31.2 billion was spend on research and development in the US IT industry.[63]

The German ICT industry is divided into two major sections: IT and telecommunications.[64] The IT section include hardware producer as well as software and IT services. The telecommunication section consists of hardware producer and telecommunication services. In 2004, the German exports of IT products increased by 11 percent (Statistisches Bundesamt 2005b). In 2005, the German IT industry had a market volume of 134.3 billion Euros, and the prognoses for 2006 was for a market volume of 137.4 billion Euros; for 2007 projections are at 140.1 billion Euros. Since 2003, the rate of growth has declined little, from 2.6 percent in 2003 to 2.4 percent in

[61] The data about indicators of the knowledge society was based on OECD and Fraunhofer ISI. Investment in knowledge included spending in research and development and in higher public and private education.

[62] In 2003 only 24 per cent of the jobs in the German IT industry were IT related occupations (Dostal 2004). Also, many people with IT occupations do not work in the IT industries.

[63] Unfortunately, there is no “Digital Economy 2004” or “Digital Economy 2005” report. The German Federal Statistics Office provides only current information about specific parts, but not about the entire IT industry.

[64] The German statistical information combines the IT industry data with the telecommunication industry data. When possible, I will try to concentrate on the IT industry data.

2005. The highest growth rate was registered for the software sector, with 5.5 percent in 2005. The second highest growth rate was noted for the IT services with 4.5 percent in 2005 (BITKOM 2006b).

Overall, the German ICT industry can be characterized as having a high level of education. In 1999, 32 percent of all employees held a university degree. On the basis of the Microcensus from 1997, this is as much as 350,000 employees with a university degree. The ICT industry and the technical services industry are the most human capital intensive industries (Zentrum für Europäische Wirtschaftsforschung GmbH 2001).

In sum, the overall growth rates of the IT industry in the United States and Germany are not considerably different. But the highest growth rate within the hardware section of the US IT industry, is much higher than the highest growth rate within the Germany IT sector, which is in the software sector (26 percent compared to 5.5 percent).

3.4 Software Developers

United States – IT workforce

Overall, the estimations of the total number of the IT workforce in the United States vary from two to over ten million. The huge range is due to the numerous definitions of the IT workforce. Using the definition of the National Research Council, there are about five million IT workers in the United States, half of them belonging to Category 1 and the other half to the Category 2 workforce. Software developers belong to the category 1 workforce, which includes those who develop, create, specify, design, and test IT goods or services. Category 1 also includes IT research (National Research Council (US) and Committee on Workforce Needs in Information Technology 2001). Category 2 includes work that involves application, adaptation, configuration, support, or implementation of IT products or services. For the National Research Council study it is important to differentiate between the two categories in order to look at the supply and demand for IT workers. Although both categories overlap in most IT jobs, the IT job is categorized on the basis of the major responsibility within it (National Research Council (US) and Committee on Workforce Needs in Information Technology 2001, 4).

According to the National Research Council the number of software developers in the United States is a little above 600,000 (National Research Council (US) and Committee on Workforce Needs in Information Technology 2001, 60ff.).

From the mid-1990s IT employment grew at a tremendous pace. After the so called “tech bubble” burst, IT employment declined dramatically. However, a study presented by the Economic Policy Institute shows that employment within the IT industry as well as employment in computer-related occupations is growing again since 2004 [Figure 3.4-1].

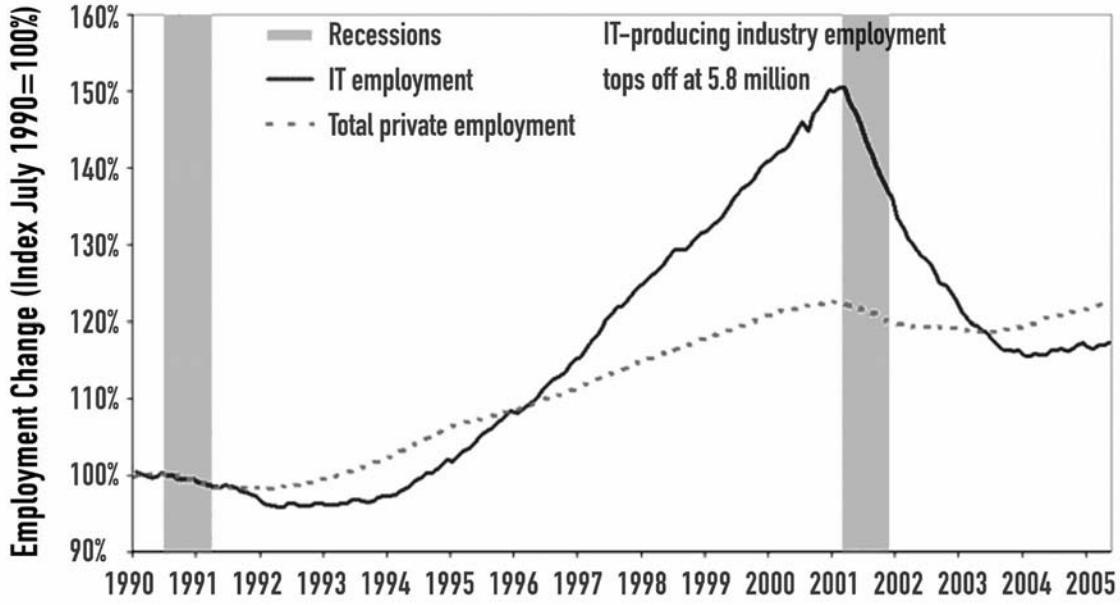

Figure 3.4-1: Employment Changes for all Private-sector Industries and IT-producing Industries (Allegretto 2005, 2)

In February 2001, IT employment represented 5.2 percent of all private-sector employment; in the middle of 2005 it lies at about 4.1 percent of all private-sector employment. Expressed as a percentage, employment in these occupations fell by 11 percent from 2000 till 2004. During the same period, the unemployment rate went up from 2.0 percent to 5.6 percent. “While employment levels in 2005 were down 4.5% from their 2000 level, they are up 7% over the last years. Computer related occupations share of employment was 2.1% in 2005, which is 0.2% shy of its share in 2000” (Allegretto 2005, 2).

Allegretto sees “an integral part of the U.S. economy” which still “play[s] a critical role in the post-1995 productivity acceleration.” In her study she shows that the decline of IT employment has stopped and is beginning to grow (slowly) again (Allegretto 2005, 3) [Figure 3.4-2].

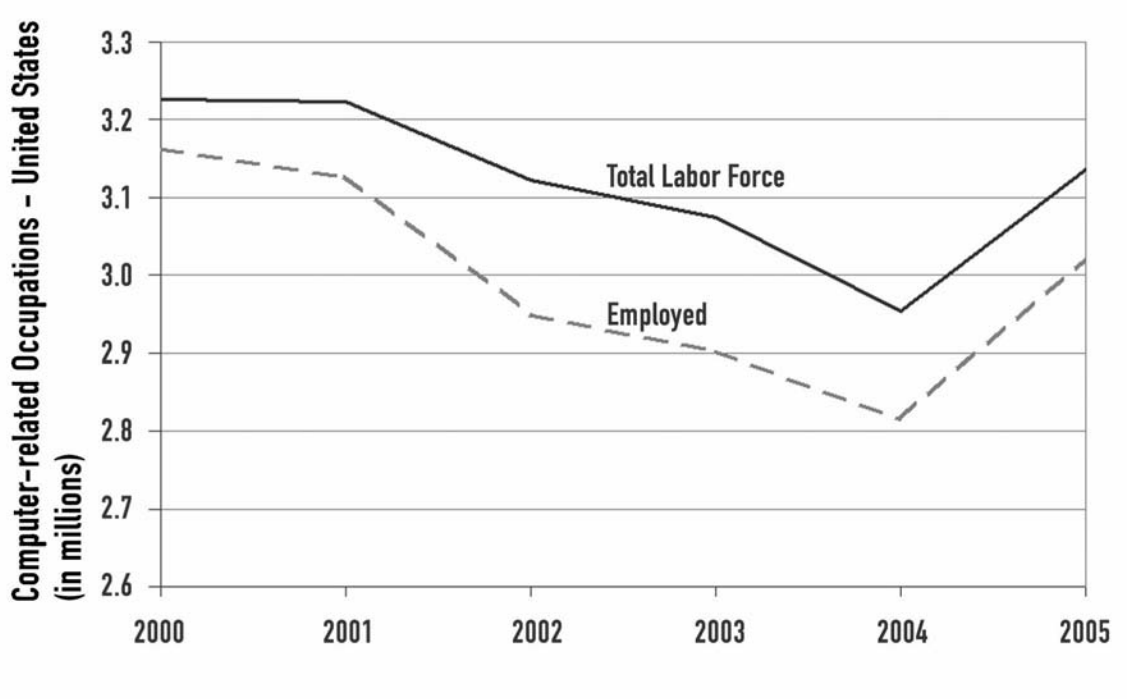

Figure 3.4-2: Total Labor Force and Employed in Computer-related Occupations, United States, 2000-2005 (Allegretto 2005, 3)

In 1997, the average hourly wage for US software developers was $20.43. In 2004, this sum rose to $28.98. Comparing the hourly wage of software developers to the average hourly wage of all occupations, software developers earn above average, and the gap between the average hourly wage of all and software developers has broadened.

Germany – IT workforce

In the beginning of the 21st century researchers projected an increasing demand for labor in the German IT workforce (Zentrum für Europäische Wirtschaftsforschung GmbH 2001). But because of the burst of the tech bubble at the beginning of this century, these projections are no longer valid. Dostal's diagnoses about the development of the German IT workforce is straightforward: "IT workforce: Stagnation" is the title of one of his recent articles. There he especially points out the difficulties in classifying this occupation correctly (Dostal 2004). One of the main problems in judging the development of IT-related occupations is that the discussions often do not use exact definitions. The value of these studies is then difficult to determine.

In 2001, there are a little less than 1.7 million workers who can be said to constitute the German ICT workforce (Statistisches Bundesamt 2002). There are 615,000 people working in the so-called "core computer-science occupations"

(Statistisches Bundesamt 2002, 75). These data are based on the Microcensus, whereas the statistics about the employees contributing to social insurance[65] counts only 455,000 people employed in this core IT-group. This would mean 160,000 self-employed or public officials, because they are not integrated in the 455,000 people. However, according to Dostal there are only about 60,000 self-employed and about 10,000 public officials working as IT professionals (Dostal 2004).[66] According to the German Federal Statistical Office among the group of IT workers there were about 184,000 software developers in Germany in 2001 (Statistisches Bundesamt 2002).

In 2000, within the IT workforce software development and programming were the most performed tasks, with a share of between 27 and 24 percent of the total volume of work for IT tasks. The next most common tasks are in the area of system and network administration, with 23 percent outside the IT industry and 15 percent within the IT industry (Zentrum für Europäische Wirtschaftsforschung GmbH 2001). This shows the high importance of software development and programming within IT related occupations.

German IT workers[67] experienced a massive increase in unemployment after the burst of the tech bubble. From 20,000 unemployed in 2000, the unemployment rose up to 70,000 IT workers. In July 2003, a total of 16,300 IT workers lost their jobs within only one month. Similar to the trend in the United States, the unemployment rate has been declining again since July 2003. In May 2003, 62,700 IT workers were unemployed. According to BITKOM (using data from the Microzensus) the number of IT workers rose again in 2005 to 462,000, which is a rise of 1.5 percent since 2004 (BITKOM 2006a).

Since 2000 the number of first-year students in computer science has been decreasing. In 2000 about 38,100 young people started their studies in computer science. In 2005, only about 29,100 started to study that subject. The prognosis for 2006 is another decline to about 27,600 students (BITKOM 2006a).

---

[65] "Beschäftigtenstatistik der Bundesagentur für Arbeit"

[66] The Microzensus survey is based on information by the employees themselves. The „Beschäftigtenstatistik" is based on the companies' classification of their employees. This might be the reason of the differences in numbers (Dostal 2004).

[67] With IT workers I refer to the German "Informatikberufe" as they are used by Dostal. Literally translated these are the "computer science occupations." "IT Berufe" would be literally translated as "IT occupation" and would include electronic engineers, electronic technicians, and data typists besides the original computer science occupations such as data processing experts, software developers, data processing managers, data processing consultants, data processing centers and user system experts, and other data processing experts and computer scientists. Because IT occupations or IT worker are much more common expressions in English, I will not use the term computer science occupation.

The unemployment rate among IT workers with university degrees is lower than those without a university degree. In 2003, the unemployment rate of the former was around 7 percent, and the unemployment rate of the latter ranged between 15 and 16 percent (Dostal 2006). Concerning education, IT workers have a unique role in the German employment system. Fifty-eight percent of ICT professionals hold university degrees (university 30 percent; university of applied science 28 percent), 36 percent apprenticeship degrees, and only 5 percent work without any diploma (Zentrum für Europäische Wirtschaftsforschung GmbH 2001). Of those with university degrees, 80 percent have degrees outside the computer science field and can be considered career changers. This concentration of career changers cannot be found in any other occupational field. In addition, there are relatively few occupations that are part of the distinctive youth apprenticeship system in Germany. During the last century only a few occupations were created, such as computer science clerks ("Informatik-Kaufmann/-Kauffrau"). In contrast to other fields, the occupational degrees coming out of the apprenticeship system are not widespread much. Here the university degree is more important (even if it is not computer science specific) than in other areas.[68] But because of the increasing pressure in the IT industry, people without a pertinent degree start to worry about their positions. A research project at the Darmstadt University of Technology is addressing these problems by developing a way of training for career changers who have collected work experience in the IT field. This project proposes a training system that is parallel to university and apprenticeship systems, but with the result of having a comparable degree for those who received their knowledge by working in the field instead of being theoretically educated. This research group takes into account the increasing importance of lifelong learning. They suggest a system to formalize this process of lifelong learning for IT-related occupation, to provide the practitioner in the IT field a possibility for formal certification of his or her long-accumulated knowledge (Müller 2004, Pereverzeva and Seger 2005).

To sum up, in 2001 the number of US software developers (according to the definition of the US National Research Council) was about 600,000, and there are about 184,000 German software developers. Proportionally, this means that the occupation of

[68] I do not want to be misunderstood here. In all areas, career chances and higher incomes are more likely with a university degree. However, there are many areas, e.g. in the banking system, in which specific careers are set up for people without a university degree.

software developers has a similar share compared to the total employment in both countries. Taking the numbers of employment in 2001 into account, the share of software developers of all occupations was 0.44 percent in the United States and 0.51 percent in Germany in 2001. Software developers are, thus, only a small group of the entire workforce in both countries. Also, there are other IT-related occupations that have comparable characteristics like the high involvement in information processing and the intensive use of modern ICT. Hence, data for the broader category of IT workers are important to include in the study as well. As stated above, in 2001 there are about five million IT workers in the United States compared to between 455.000 and 600.000 IT workers in Germany. This is 3.65 percent of the US workforce and between 1.25 and 1.65 percent of the German workforce. Despite the problems with determining the definition of these occupations, it is becoming obvious that there is about a double share of IT-related workers in the US than in Germany.

The unemployment rate among IT workers differs considerably between the two countries. In the United States the 2004 unemployment rate for IT workers was the same level as the overall unemployment rate. In Germany, the unemployment rate for IT workers with university degrees was considerably lower than the overall unemployment rate, and for those without university degrees it was much higher than the overall unemployment rate in 2003.

3.5 Consequence: More Differences than Similarities

The chapter at hand has presented current and comparable empirical data concerning important variables of the US and German labor market as well as for the US and German IT industry and software developers. The goal of this chapter is to give an impression of differences and similarities in both countries. It has become clear that there are considerable differences between the two countries, despite the fact that both countries are considered highly developed modern countries. Similar to the findings in chapter 1 about the notable institutional differences between the countries, the actual empirical situation is quite different as well. Despite the many differences we also find similarities between the US and German labor markets. Also, the indicators of the IT industries and IT work force show several similarities. Among the striking similarities in both countries are the ratio of working poor, the relative persistence of inequalities across the employment process and the relatively lower income of women compared to that of men.

Some important differences need to be pointed out here again. The United States have a continually growing population, whereas the population development is basically stagnating in Germany. This shows a tendency towards flexibility in the United States and towards inflexibility in Germany concerning their societal construction.

The relatively low unemployment rate in the United States compared to the fairly high unemployment rate in Germany cannot be excused with the higher percentage of the working poor in the United States. Even taking into account the weaker social system and the higher total amount of working poor in the United States, according to recent studies, the ratio of working poor compared to all workers is about the same in Germany and in the United States. However, the individual mobility of income is much higher in Germany than in the United States. This shows that working poor people in Germany have a better chance to move out of their situation than working poor people in the United States. This aspect suggests a higher flexibility concerning social changes in Germany than in the United States.

The labor markets of both countries concerning a higher or lower flexibility in light of their detailed empirical characteristics are surprisingly somewhat balanced. The institutional framework of the United States is more flexible than that of Germany, but the actual employment situation is not as distinct. For example, the different part-time employment ratio would suggest a higher flexibility in Germany, but the differences in paid overtime would suggest a higher flexibility in the United States.

This brief summary shows how difficult it is to work with the category of flexibility. It demonstrates that there are underlying, more complex tendencies accompanying the changes in labor markets and labor processes that need to be taken into account in order to more fully substantiate my thesis. This is one of the goals of the following chapters.

Overall, the empirical material was presented to provide the necessary background information for the analytical part of this study, which follows this chapter. Knowing the preconditions in both countries makes it easier to make judgments about similar or different tendencies. Because the theoretical concepts of current societal developments, for example the approach of informational capitalism, represent developments in the entire world or at least in all developed countries, one of my goals is to find out if changes within the labor processes are similar as well. This is one reason why I am focusing on developments within the United States and within Germany. The two countries have different institutional frameworks and labor market situations. Are

changes within the dimensions of space, work, employment, and time similar despite these different preconditions? If yes, it would be possible to talk about global developments, if no, it would be important to differentiate more specifically when building large theoretical approaches in the future (Benner and Dean 2000).

PART II

In PART I of this study I discussed the theoretical (chapter 1) and empirical (chapter 3) background as well as the theoretical and methodological framework (chapter 2) of analyzing flexible labor in informational capitalism. Before looking more closely at the four dimensions of the labor process (space, work, employment, and time), I would like to provide information about the empirical material that forms the basis of this study. The results of my study are based on a literature review of theoretical and empirical (quantitative and qualitative) studies, as well as primary qualitative empirical data. The following institutions were searched systematically for significant information and studies.

UNITED STATES
Economic Policy Institute (EPI)
Information Technology Industry Council (ITI Council)
Massachusetts Institute of Technology (MIT)
National Bureau of Economic Research (NBER)
US Department of Commerce
US Department of Labor Bureau of Labor Statistics (BLS)

GERMANY
Centre for European Economic Reserach (Zentrum für Europäische Wirtschaftsforschung - ZEW)
European Foundation for the Improvement of Living and Working Conditions
Federal Statistical Office Germany (Statistisches Bundesamt Deutschland)
German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung - DIW)
Hans-Böckler-Foundation (Hans-Böckler-Stiftung)
Institute for Employment Research (Institut für Arbeitsmarkt- und Berufsforschung - IAB)
Institute for Social Science Research Munich (Institut für Sozialwissenschaftliche Forschung - ISF)
Institute Work and Technology (Institut Arbeit und Technik - IAT)
OECD
Research Inst. Work Education Participation (Forschungsinstitut Arbeit Bildung Partizipation - FIAB)
Social Science Research Center Berlin (Wissenschaftszentrum Berlin für Sozialforschung - WZB)

Figure 3.5-1: Institutions Researched for Empirical Information about the US and German Labor Market Situation

In addition to secondary data I collected empirical data in interviews. I am now giving a rough overview of the researched companies and subsequently about my interviewees.

Company 1 is a successful US software developing company in a small college town in the Northeastern US. It was founded by three faculty members of the local university in 1972. The company was closely connected to that university until 1982,

when it became a private company. Today, about 200 people work there. The company operates internationally, running subsidiaries in England and France. I will call this company US Stat Corp, because it specializes in developing statistical software.

Company 2, which I will call US Trad Corp, is an established US hardware company that was founded in 1953. US Trad Corp has about 1,500 employees. The company operates internationally, with subsidiaries in a lot of different countries around the world. Due to the growing demand for software solutions for the hardware supplied by US Trad Corp, it has a relatively new and growing software developing department. It is located in a small college town in Northeastern US.

Company 3 is a prospering German software developing company that was founded in 1997 as an IT service company for two important software companies in Germany. It has about 1,800 employees and nine branch offices across Germany. The new headquarters is located in one of the newly formed German states. The company is going to be taken over by the bigger mother company and is being heavily influenced by the management practices of the mother company already. One of my interview partners was a free lancer for that mother company. Because the entire interview partners where at that point influenced by the same management I mention all of them in context of this company. The office (former headquarters) in which the interviews took place is located in a small town close to a German metropolis. I will call this company simply German Soft Corp.

Company 4 is a successful German software developing company that was founded in 1969. It employs about 2,500 people in 59 countries and has about 3,000 customers. The company is located in a small university city close to a German metropolis. This company I will refer to as German Dev Corp.

For a better picture of interviewees in my sample I constructed a matrix with six important personal categories (Table 3.5-1). These are: education, career path, current position, age, gender, and nationality. The summary shows that there is a high variance of all six characteristics in the sample, which therefore represents the most dissimilar case design (Yin 1994) concerning the interviewees. There are some interview partners with a computer science background, but there are also interviewees with a retail, bank or physics and mathematics background. There are employees with university degree and others with an apprenticeship diploma. I differentiate between those with a stable career and those with a highly flexible career. Also, I identify career changers in the sample. The current positions range from software developer and system administrator

to team leader or senior consultant. I have interviewed young, middle-aged and old employees as well as male and female workers. The interview partners are US American and German and there is also one Indian employee who lives and works in the United States. For a more detailed description of the interviewed persons see appendix B.

	EDUCATION	CAREER PATH	CURRENT POSITION	AGE	GENDER	NAT.
George (US Stat Corp)	Highly educated in mathemathics and physics	Stable career	Software developer	Old	Male	US
Jim (US Stat Corp)	Computer science	Stable career	Software developer	Young	Male	US
Susan (US Trad Corp)	Background in retail and computer science	Career changer	System administrator	Middle-aged	Female	US
Vivek (US Trad Corp)	Highly educated in electrical engineering and computer science	Stable career	Team leader	Young	Male	Indian
Tom (US Trad Corp)	Highly experienced electrical engineer	Several careers within one company	Leading position	Old	Male	US
Herr Maier (German Soft Corp)	Computer science	Highly flexible career	Senior consultant	Middle-aged	Male	GER
Herr Pfeiffer (German Soft Corp)	Apprenticeship bank diploma	Career changer	Team leader	Young	Male	GER
Herr Lang (German Soft Corp)	Computer science management	Highly flexible career	Freelancer	Young	Male	GER
Herr Roth (German Soft Corp)	Business economics	Rather flexible career	Senior consultant	Young	Male	GER
Frau Schmidt (German Dev Corp)	Computer science	Stable career	Team leader	Middle-aged	Female	GER
Frau Müller (German Dev Corp)	Computer science	Stable career	Team leader	Middle-aged	Female	GER
Herr Klein (German Dev Corp)	Apprenticeship electrician diploma and computer science	Career changer	Software developer	Middle-aged	Male	GER

Table 3.5-1: Basic Information about Interviewees.

The intention of this second part of the study is to provide an inside view of contemporary changes within the four dimensions of labor: space, work, employment, and time. Within all four of these dimensions the development and relevance of flexibility will be the underlying question and focus. Quantitative empirical material supports the explanation for basic changes. But the way the questions are asked in this study suggest an additional focus on empirical qualitative material.

Concerning space, one of the main questions is whether spatial changes are relevant and obvious within the labor processes.

The dimension of work can be conceived only in a rather intangible and abstract manner. Therefore, interpretation of qualitative empirical material is most helpful to answer the fundamental questions of how informational capitalism manifests itself within this dimension of the labor process. The underlying assumption is that increasing flexibility helps the worker to handle the increasing demands of work today.

For the dimension of employment it is important to call attention to the less obvious developments that could be described as increasing flexibility. Topics that are not enough brought up within that category provide important insights for a further understanding of flexible employment relationships.

The category time is also approached differently than it usually is discussed in research about changes in labor. Two broad categories are being distinguished from each other here: the individual and economic aspects of time.

4 Space

In chapter 2 I introduced how different spaces play a role in informational capitalism. In this chapter the role of space for contemporary labor processes will be discussed. At first, however, space as a social science concept will be introduced more specifically.

Despite the fact that the abstractness of the term space is an advantage for researching in this field, a clear definition of space is necessary. Castells defines space as the "material support of time-sharing social practices" (Castells 1996, 411). He emphasizes that space (as well as time)[69] can be understood only in connection with social action, which is also stressed by Harvey (1990, 204). Castells broadens this approach in his recent study by developing a theory of the space of flows. Castells defines flows as "purposeful, repetitive, programmable sequences of exchange and interaction between physically disjointed positions held by social actors in the economic, political, and symbolic structures of society" (Castells 1996, 412). In his opinion the most important characteristics of space today is that spaces exist as only flows. This is based on his view that society today is generally constructed around flows, like flows of capital, flows of information, etc. (Castells 1996, 412). The basic proposition of Castells is that social boundaries are not defined but change constantly today. There are no defined, set spaces where people interact, but these spaces change, overlap and interact continuously. Most important is the theoretical assumption that space and place do not disappear, but that new kinds of spaces emerge. These can be characterized as network-kind of spaces. Communication is a very important variable in these settings, because social interaction is based on communication. Castells' definition of space and his theoretical approach to the space of flows therefore expresses an immanent flexibility of contemporary space.

With the changes in society that are summarized as globalization (see chapter 1) research about the changing role of space becomes increasingly important. In particular, space as a dimension of the work process is increasingly viewed as relevant in

[69] As Castells puts it, "Space and time are the fundamental, material dimensions of human life" (Castells 1996, 376). His approach differs from most classical social theories, where space is dominated by time. Instead, Castells proposes that space organizes time in the network society (Castells 1996, 376). With that he justifies the order of his research, first concentrating on space and then on time. Important in this study is the fact that time and space are theoretically connected. It is reasonable, though, to analyze time and space separately to reduce complexity. Concerning flexible labor in informational capitalism I would not generalize that space organizes time. What is important to note, though, is that the dimension of space did not receive enough attention for a long time, whereas time and its flexibility is a prominent issue since the beginning of restructuring of the economy in the 1970s.

connection with the processes of globalization. However, there seems to be a rather stereotypical view of how globalization influences the spatial aspects of labor processes. Lee and Sawyer summarize the current status of the majority of work on the spatial (and temporal) dimension of changes in the labor process as follows:

> "To date, much of the scholarly and public discourse on time, space and ICT have deproblematized these concepts: often by developing simplistic views of all three. Articles in both the popular press and the academic literature trumpet the potential for the use of information and communication technologies (ICT) to save time, speed up work, and allow people to collaborate and communicate with other people located in different places and across different time zones. This technological opportunism is further fuelled by the connectivity that the internet embodies and we are encouraged to think of work and organizations in new ways and with new possibilities. People imagine and write on techno-social concepts such as the emerging 'virtual organizations,' the possibility of having 'virtual offices,' and the ability to get work done by 'virtual teams' whose work patterns "follow the sun" and "span the globe." Exactly how this will occur is less often discussed, and too-rarely with any evidence or rigor." (Lee and Sawyer 2002, 1)

In this chapter I will address the role of space within the labor process, trying to focus on its immanent flexibility. My goal is to broaden the "simplistic views," as Lee and Sawyer refer to them, and to show some insights into the relationship of space and labor.

4.1 Global Spatial Labor Trends

Global spatial labor trends are characterized by the two opposed processes of decentralization and concentration. Decentralization occurs with the internationalization of production that accompanies flexible production. Through decentralization a flexible production space emerges. This process is self-evident within global informational capitalism (see also discussion in chapter 1). However, the tendency for economic power to concentrate in cities and regions is often ignored. Global cities are components of the new spatial global structure which can be described as a new geography of centrality (Sassen 1996). The concept of global cities calls attention to the continuing importance of space in a globalized world. In addition, the territorial diffusion of companies encourages the centralization of functions and processes that accompanies centralized management and control due to specialized services, production-oriented services, and telecommunication infrastructure (Sassen 2000, 161).

An important characteristic of global cities is that they are globally connected and at the same time locally disconnected (Castells 1996, 404). This characterization

applies to both the physical and social components of global cities. Referring to his theory of the space of flows, Castells describes the nature of global cities as follows:

> "I shall argue that, because of the nature of the new society, based upon knowledge, organized around networks, and partly made up of flows the informational city is not a form but a process, a process characterized by the structural domination of the space of flows." (Castells 1996, 398)

The development of global cities is pertinent to the global spatial labor trend because a milieu of innovation is important for staying competitive in informational capitalism. The milieu of innovation features a relationship between production and management. This relationship is based on a social organization with a specific work culture (Castells 1996, 389).

Along with the emergence of global cities comes the development of a new industrial space (Castells 1996). This new industrial space can be considered a part of the tele-mediated space that emerges due to the increasing application of information and communication technology within the labor process. A consequence of the new industrial space where the labor process is based on modern ICT is the emergence of a different occupational structure. A highly skilled labor force based on science and technology stands distinct from a mass of unskilled workers. This is well described by Robert Reich, who calls the highly skilled labor force "symbol analysts" and distinguishes this group from the mass of low-skilled routine workers and service workers (Reich 1993). IT-related occupations are a good example for this polarization of occupations described by Reich.

Specific industrial sectors, like the high-tech industry, are concentrated close to metropolises. Therefore, the IT industry is only supposedly a placeless industry. Especially in research and development it profits very much from informal networks when different companies are clustered in an area. Firms and workers tend to cluster in valleys and alleys to transcend space and time. There are advantages of agglomeration due to contiguousness of competitors. A spatial closeness leads to exchange of information between companies. Generally, economic processes in IT work differently from those of the traditional production industry. It is important to exchange information with competitors to survive. Being near universities is important as well, because there are qualified graduates whom companies can recruit (Krätke 1990). This situation was confirmed by a study within the New York new media industry. Because of the conglomeration of a highly flexible network of firms, regionally based development strategies and regional partnerships are important for employees in the

new media industry. The mobility of workers in the new media industry is typically characterized by moving on to a new company rather than moving up within a company (Batt et al. 2001, 45).

All in all, macroeconomic restructuring within and beyond countries influences the economic development of cities and regions. But it is more appropriate to talk about a modification of long-term spatial developments than of a development of a new spatial structure (Krätke 1990, Castells 1996). Fordist principles on a spatial level coexist with concepts emerging out of the informational capitalist structures.

How the spatial restructuring of economy directly influences the labor process is shown by outsourcing and off-shoring activities practiced by more and more companies and affecting more and more workers.

4.1.1 Outsourcing and Off-shoring – Spatial Elements of Flexible Labor Organization

> "I cannot coach an Indian on the phone and through this teach the German service cogitations. This is not possible." (Herr Pfeiffer, 32 years old, German Soft Corp)

Relocation of work is not an entirely new phenomenon. However, during the 1970s and 1980s it concerned only the classical production industries. For example, the hardware section of the IT industry has had international production for decades. During the 1990s these production capacities were integrated into a new organizational model, which can be described as an internationally distributed network production system (Boes 2005a, 18).

Concerning the IT industry, services production capacities were not built up in off-shore regions until the end of 1990s. Today, internationalization increasingly concerns office work more than production work (Boes 2005a, 19).

The internationalization of production includes outsourcing activities. The rationale behind recent off-shore initiatives is the reduction of the vertical range of performance analogous to the reduction of the vertical range of manufacture when production was internationalized in earlier decades (Boes 2005a, 20).

Off-shoring is a prominent example of how spatial restructuring influences the labor process. It strikingly shows the opposing perspectives within informational capitalism. Although off-shoring is viewed by employers and managers as a modern and necessary method for decentralizing and reducing costs it has negative effects on

employees, such as reduction of wages, increase in work time, and precarious employment conditions (Bleicher et al. 2002). Other controversies regard the alleged positive increase in flexibility and reduction of cost achieved by outsourcing IT, benefits that are accompanied by the negative aspects of the loss of company knowledge and questioning of the competencies of the individuals providing IT services through an outsourced arrangement (Klahn and Stephan 2004). Whether off-shoring increases productivity cannot be backed up by empirical data today. Therefore, there is no evidence to back up an important argument in favor of off-shoring activities. Off-shoring may or my not lead to increased productivity (Bednarzik 2005).

Based on an empirical study, Boes and Schwemmle (2005) identify three different concepts of off-shoring.[70] They call the variation of off-shoring that is most often perceived in public discussion "offshore-outsourcing." In this variation off-shoring is understood as a specific form of outsourcing, in which the work is relocated to far away countries with the goal of reducing in the vertical range of performance. The management accepts losses of workplaces in high-wage regions when applying this strategy. Because of the focus on the substitution of the workforce, this strategy can be described as "substitutive off-shoring."

A different variant concentrates on an extension of international production capacity and the development of new international markets. The reallocation of workplaces is not the main focus in this approach. This kind of off-shoring does not reduce the vertical range of performance of the company. It concentrates more on the creation of international production structures. The processes behind this kind of off-shoring are more complex and the effects are ambiguous. As a result, it could be a substitutive, but also an additive form of off-shoring. A third variation of off-shoring concerns the improvement of the cost structures.

In reality, the described variations usually exist as mixed models. To explain what stands behind off-shoring it is still helpful, though, to analytically separate the tendencies. IT companies focus on the usage and expansion of their own production capacities. None of the eleven companies questioned by Boes used an off-shoring outsourcing strategy when commissioning foreign service companies. From what I learned from the software developers interviewed their companies, too, did not use off-shore ourtsourcing strategies. The public, however, associates this kind of off-shoring as

[70] The results presented are based on the study of Siemens and SAP in Germany and IBM and EBS in the United States.

the common variation of off-shoring. Most modern information and communication companies use their own production capacities in offshore and nearshore regions. IT companies want to keep organizational control over their off-shore activity (Boes 2005a). It is unclear, however, in which directions these strategies will consolidate in the future (Boes 2005a, 47ff.; Boes and Schwemmle 2005, 9ff.).

High cost is the most prominent argument in support of off-shoring activities. But there are very different figures concerning the actual savings. In addition, costs alone cannot explain the recent off-shoring trend, because the differentiation in wages existed even before off-shoring started its boom phase (Boes 2005a, 22).

Therefore a more convincing explanation concerning the recent trend is needed. The preconditions for off-shoring fundamentally changed during the 1990s in the light of the creation of an international available information space, the emergence of a "world labor market" for information technology workers, and a radical change in products and services (Boes 2005a, 26).

Information space becomes relevant when discussing off-shoring, because use of different time zones as well as production around the clock can be additional arguments for off-shoring.[71] The spatial reality of production, especially service production, changed due to the emergence of the Internet. Today, it is not only cheaper to reallocate work but, in addition, highly qualified workers in off-shore regions are available. Increasingly, the kind of work being relocated requires higher qualifications.

Interestingly, the interviewed software developers do not see this development towards an increasing outsourcing of qualified work. None of the twelve interviewed persons were afraid of losing their job due to outsourcing.[72] They do not fear for their jobs, even though some of them instruct their Indian colleagues. Their own reasoning of this view shows that in their opinion specific tasks cannot be outsourced very well. They seem to realize that the outsourcing activities of their companies might follow a substitutive instead of a pure additive variation of outsourcing. In addition, they pointed out that coordination of tasks takes on increased importance when some of the work is outsourced. They see themselves in the role of coordination more and more.

[71] The time zone difference was also mentioned by my interviewees as an argument for off-shoring in their companies.

[72] I am aware of the fact that this is not a representative amount of employees. But it still gives valuable hints in how software developers find ways to handle their – as regarded from the outside – rather insecure situation.

George argues, for example, that some of the information he handles has to be kept in-house. He notes that rather routine jobs are being outsourced, but not priority-information jobs. Even he, as one of the interviewed software developers who still actually works with the technology and does not have additional tasks, says that there are jobs being outsourced that are not the kind of job that he does. George sees two necessary premises that must be in place for work to be oustourced: the work project has to be well defined and rapid communication must be possible.

> "Outsourcing can be done if the work project is well defined and defined enough to the point that it can be done by someone else. Since communication can be so rapid by email that means that one can monitor work done by outsourced persons quite rapidly. It's a matter of economics I guess." (George, 82 years old, US Stat Corp)

In his judgment outsourcing is a matter of economics, but economics is not the only argument for outsourcing as described above.

Jim explains his lack of fear concerning outsourcing by emphasizing that only specific kinds of jobs can be outsourced. He characterizes these jobs as "little pieces." In his view it is not possible to outsource more complicated jobs.

> "There are still lots of jobs in the United States. Sometimes the media is a little bit out of proportion. Like Microsoft they have tons of outsourcing work, but they would never move the whole company to India. There are certain things you can develop offside, like pieces of work. There is so much experience and time and money they spend on teams and team leaders it would just be very difficult. On new products they could very easily, but there are still a lot of problems with communication, time zone differences etc."
>
> "Do you think it is a problem if people develop pieces of products somewhere else?"
>
> "It depends what kind of work it is. If it is stand-alone, a little piece of something, than maybe not. But if it needs any kind of cooperation it gets much more complicated. We have that right now with our partners in China. It's like a two day loop. If we ask a question we have to wait. It is not very efficient sometimes; especially, if you need to communicate. But if people are in their self-contained thing then it's easier. … For outsourcing there has to be a well-defined project, there have to be very detailed requirements. Maybe then you can save some money. But what most software is, there are requirements, but they are not detailed enough, that they implement everything. And then the problems start. And it's different if you can walk down the hall and talk for 10 minutes and then the problem is solved. It's just emails you know and if you are not very detailed in your emails than you have the same problem. But if you are face to face and are in interaction and you are not detailed enough the questions come back immediately." (Jim, 31 years old, US Stat Corp).

As described above, we know that more and more jobs that require higher qualifications and that cannot be described as producing a "little piece work" are being performed off shore. But software developers do not necessarily see this development

and therefore do not feel personally threatened concerning off-shoring activities. In addition, this might be a substitutive form of off-shoring.

My interview partners call attention to the turnover of coworkers in off-shore regions. Their experience is that foreign workers are trained in Germany at a company – a process that is very resource intensive – and after a short time working at the project at the off-shore company they move into better positions in other companies in their home country. The costly and time-consuming training process did not bring many benefits for the company. Off-shoring in their view causes more problems than benefits.

Independent of what kind of jobs are being outsourced current data support the impression of my US interview partners, that layoffs because of movement of work (including outsourcing and off-shoring activities) are not as high as often assumed. Only a range of about 55,000 to about 73,000 separations are due to movement of work in 2004. Only about 10,000 account for separations within the IT industry (Brown and Siegel 2005, see also Bednarzik 2005).[73] With over 10 million created and lost jobs in every quarter, these are fairly small numbers.

In the United States the resistance against off-shoring is more developed than in other developed countries (Schwemmle 2005, 153ff.). The reason lies in the intensive public relations work of the local unions against off-shoring. Also, the high moral expectations that American companies should provide jobs for Americans are widely spread among American workers and consumers. The latter is important because unions are able to put pressure on companies by informing the public about the company's employment strategies. These companies then fear loss of consumers. This strategy is more important in the United States than in Germany, because, first, its economy is based on consumption more than in Germany, and, second, the loyality to buy local products is more intense in the United States. Nevertheless, global companies are successful in fighting against these values. In a debate on a topic like off-shoring, where personal involvement comes into play, these moral values help in fighting off-shoring. American unions concentrate on public relations work and work politically to gain legal footing against the off-shoring trends. They do not think it is possibile to convince companies not to practice off-shoring. These political appeals concern many issues. Strategies used are gaining support for the parties who are negatively affected and

[73] These data are based on the Bureau of Labor Statistics Mass Layoff Statistics (MLS), which includes questions concerning the topic of off-shoring and outsourcing since 2004.

cancelling of subsidies for companies that are involved in off-shoring.[74] Overall, according to the AFL-CIO[75] the off-shoring trend is dangerous and could lead to a destruction of the American middle-class as well as to a "distortion of the global economy to benefit corporations at the expense of workers everywhere" (AFL-CIO 2004). The off-shoring discussion by American unions has led to a generally invigorated role of unions in America.

In Germany, the threat because of off-shoring is lower than in the United States. One assumption is that German IT jobs are more intensely connected with the customers. And IT jobs are less likely to be reallocated, according to Stephan Pflisterer, an expert in this field (Schröter 2006). The focus of public discussions about outsourcing and off-shoring processes changed from a business economic perspective about reducing costs of production to the prospects for Germany as an important economy. The talk about reducing social standards gained importance over the concerns about maintaining quality, innovation and qualification in the production process.

According to Schwemmle there are four general options in Germany for action of unions concerning the off-shoring trend: (1) protectionist concepts that try to hinder off-shoring under all circumstances, (2) competition conceptions that try to reveal hidden costs and implicit risks, (3) conditioned toleration, which was mentioned concerning the strategy of the international union, and (4) the model of internationalization, in which off-shoring is viewed as a natural element of globalization. The location and viewpoint of the union determines the strategy on which they embark. It has become clear, though, that there is not one consistent strategy at the moment. Schwemmle believes that unions need to expand their perspectives, moving away from a national to an international perspective (Schwemmle 2005, 158ff.).

The international union[76] has members from countries that profit from off-shoring as well as from countries that suffer from off-shoring. Therefore, the union favors the position of a conditioned toleration, meaning that off-shoring should be tolerated where necessary but only under specific conditions, such as when there is

[74] Aside from the IT area the relatively influential role of unions can be observed concerning the action against the Wal-Mart company. There is a fairly big group in the United States that has been trying to force Wal-Mart to improve its working conditions. Unlike in Germany, where it is very hard to involve students in these kinds of labor activities, there are union-affiliated groups of students active in a fight against Wal-Mart and off-shoring.

[75] The AFL-CIO is a nationwide labor union in the United States.

[76] The international union is the Union Network International (UNI), which is an association of nationwide labor unions.

support for employees that might lose their job due to off-shoring, and when internal negotiations about the consequences and possibilities of the planned off-shoring arrangements are made public (Schwemmle 2005, 147ff.).

Boes sees a development of a "world labor market" (Boes 2005a, 29ff.) whereas Castells denies a development of a "global labor force" (Castells 1996, 94ff. and 232ff.). It is important to differentiate between the two terms. The "world labor market" described by Boes addresses the increasing competition because of outsourcing and off-shoring activities. The national labor forces are affected, because national labor forces have increasing connection with labor forces of other countries. Castells refers to totally mobile workers. But only about 5 percent of the world workforce moves between countries. Expatriates, for example, are highly specialized workers with a high amount of information processing in their work who move around the world. The vast majority of workers are locally oriented at least oriented within their home country.

Other research results related to this question are briefly described below. Bernstein, for example, criticized the argument that more education of workers counters the off-shoring trend of even the highly skilled labor force in the United States. The wages of programmers in India is 1/8 that of programmers in Silicon Valley, a difference so wide that it is rather unrealistic to think that skills of the US workforce can be increased enough to make up for this difference. Therefore, he argues in favor of policy solutions that address the demand side of jobs, such as creating new jobs and keeping existing jobs here through policy action. Examples of such policies are prohibiting contracts from being performed overseas unless it is necessary, eliminating tax advantages for profits that are earned overseas, and closing tax loopholes in general (Bernstein 2004).[77] Other research regarding outsourcing shows that outsourcing activities result in wage raises for employees at the home company, if these employees are highly qualified and use IT on their job (Bertschek and Spitz 2003). There is also empirical evidence that outsourcing results in staff reduction (Beckmann 2000). Beckmann's results are not contradictory to those of Bertschek and Spitz because the former study included only employed persons. For highly qualified workers who do not loose their job because of outsourcing, wages increases. But persons who lose their job most likely face wage decreases when finding a new employment.

[77] Bernstein presented these research results about the role of skills and education before the committee on education and the workforce of the US House of Representatives in Spring 2004.

Off-shoring generally carries with its tensions between place and space of production, between standardization and specific costumer-oriented flexibility, between opening international markets and preserving an independent IT industry structure, and between rationalization and active support (Boes 2005a, 57).[78] Thus, off-shoring is one example of increasing flexibility at the global spatial level of the labor process. In sum, flexibility can be considered as a "basic coping mechanism for existing locational forces" (Castells 1996).

4.2 Business and Social Networks

On a different level network organization plays an important role regarding spatial aspects of the labor process. Networks and networked organizational structures represent a modern configuration of labor processes. As already discussed in chapter 1, networks are indeed important organizational structures in informational capitalism, but certainly they are not the only adequate organizational structure (Schmiede 2006). Even though Castells coined the term "network society," his analytical work on networks itself is rather weak. Wolf, for example, criticizes Castell's analysis. Wolf describes the term network as the catchword for the institutional embedding of economical activities (Wolf 2000). He sees the network as a new stage of the development of productive power. In his view it is important to regard the inter- and intraorganizational figurations of the network instead of following a simplistic, one-dimensional view of the network. In this context, Wolf criticizes Castells simple definition of network as "… a set of interconnected nodes. … Networks are open structures, … integrating new nodes as long as they are able to communicate within the network, …" (Castells 1996, 470). Because capital and interests of authority are interdigitated within the modern network structures it is important to view the network in a relational (as supposed to static) way. In addition, Wolf criticizes the oversimplification made by other scientists in contrasting organizational structures like markets, hierarchies and networks, because in his view markets and hierarchies also involve network structures (Wolf 2000).

Powell, however, shows the differentiations between markets, hierarchies, and networks from an analytical perspective without simplifying the theoretical models. In his analysis it becomes clear that networks are not an entirely new structure, but

[78] Opposed trends can be observed in the banking sector. For a few years there are tendencies to bring back outsourced parts of the company (Viehöver 2003). This process is called in-sourcing.

networks are a broadened perspective on organizational structures in general. Nevertheless, network structures are becoming more and more important because of having a high involvement of know-how, requiring trust, and having the possibility of handling processes quickly (Powell 1990). These are characteristics that are becoming more and more important in informational capitalism overall.

In line with Powell, Rammert also views networks, compared to markets and bureaucracies, as appropriate organizational structures today. He develops theoretical implications of how the network is the current best organizational structure for innovations. The insecurity of markets and the missing coordinating possibilities in terms of differentiated times and tasks of organizations (the state and bureaucracies) lead to the need for network connections. Networks are created by negotiations and trust instead of exchange and allocations (markets) or money and power (bureaucracies). Rammert emphasizes the advantages of networks, especially concerning the aspect of time. They provide an open time horizon so that heterogeneous organizational parts can therefore stand in timely flexible coorperation (Rammert 1997).

David Knoke's analysis of changing organizations shows the spectrum of networked organizations (Knoke 2001). In his view, the functionality of networks in organizations extends the organization of interorganizational relationships and high-performing workplaces. Knoke differentiates between four different forms of networks. Internal network organizations (1) are usually based on informal relations.

> "To adjust rapidly to environmental opportunities and threats, an internal network organization must flexibly reconfigure informal subunit ties without waiting for authorization from top management" (Knoke 2001, 207).

Within multinational differentiated networks (2), the relationship between members of the organizations takes the center stage of interest. This network form is important when a global as well as national reaction is necessary and in cases where relatively weak ad hoc structures need to cooperate.

Knoke further defines a virtual organization (3) as a corporation that "extends interunit ties outward." The lead firm takes center stage in the virtual organization. Knoke distinguishes virtual organizations from small-firm networks because he sees a higher interdependence and duration of these interunit relationships. He emphasizes the importance of good communication structures and modern ICT in order to provide the necessary flexibility and coherence among members of the virtual organization.

The spherically structured network firm (4) is created by a high collaboration among its members. It does not have a lead firm, but equal relationships among its members provide a high efficiency and velocity when cooperating.

These different types of networks defined by Knoke have different requirements for employees. Generally, theses organizational structures have higher flexibility and insecurity for employees. It is important to differentiate between these forms of network organizations to understand the consequences for organizations and their members.

To describe the network environment Boltanski and Chiapello (2003) developed a theoretical construct of the "project-based polity." With that they offer an alternative to the explanations of modern organizational structures as networks. They emphasize the importance of the project construct because a project is able to regularize network processes. It is also important that network processes be organized through the project-based polity because it provides limits within the networked world. A project is defined as a temporary connection of diverse persons who function as a highly active partition of the network. Therefore, Boltanski and Chiapello acknowledge that society and organizations are characterized by networks, but they emphasize the important role of the project, as a smaller entity, that brings structure into the networked organization.

Empirical studies concerning the role of networks in the labor process are very limited. In general, the empirical network analysis is much more institutionalized in the United States than in Germany (Jansen 2003, 48). But especially concerning the analysis of labor markets in combination with the topic of social inequality, the empirical network analysis has recently becomes more important again (Jansen 2003, 254ff.). The following paragraphs do not present empirical results in the sense of an empirical network analysis, but give some insights in the empirical role of networks.

Especially regarding the information workforce, social networks play an important role. This was empirically supported by Batt et al. (2001) for the group of "new media" professionals. New media refers to forms of electronic communication enabled by computer and network technology. Concerning their job search and employment security, social networks are very important. Interestingly, workers over 40 benefit more from professional associations in finding a job than from social networks. Also, women and minorities depend less on personal networks. Therefore, the dependence on personal networks may be responsible for labor inequalities. In sum, to improve employment sustainability personal networks and associations are central for

new media professionals. The role of government policy is particularly important for achieving better employment sustainability (Batt et al. 2001).

In her article about open labor markets and learning in Silicon Valley, Saxenian strikingly points out how different the Silicon Valley economy functions compared to more traditional economic areas. The reasons for this difference are the loosened boundaries between firms and the high dependence on interfirm and social networks. A regional labor market that focuses on regional relationships rather than internal firm relationships is advantageous for the economic success within Silicon Valley. Silicon Valley is a good example of the social embeddedness of labor markets.[79] "… [C]areer mobility in Silicon Valley depends centrally on participation in local networks of social relations" (Saxenian 1996, 24). Important for the functioning of Silicon Valley's networks are the relatively small distances that have to be covered when changing jobs. Thus, reorienting professionally did not necessarily require major changes in private life. This is different from many other regions in the United States and strikingly shows how important regions still are and that they may become even more important for current labor processes despite the aspect of globalization.

In Germany, the growing importance of personal networks has impacts on the public labor administration and labor market integration. A recent study shows how this connection leads to the necessity of integrating personal networks into the approaches of public job consulting and public employment service (Wirth 2006).

The various approaches explaining the nature of networks all present helpful points of contact for the further analysis. First, networks need to be distinguished from hierarchies and markets. Projects help organizing and limiting network actions. The detailed description of various types of networks helps to classify specific activities within the labor process. Overall, the characteristics of networks can be summarized as being more flexible than other organizational structures. Networks can react flexibly to a changing environment and adapt better to changes.

4.2.1 Communication in Network Space

Communication has always been an important component of the labor process. However, it is incontestable that the role of communication changes within modern

[79] The concept of social embeddedness of labor markets was first introduced by Granovetter (see Granovetter 1988, 1995).

labor processes. The role of communication for the labor process is changing especially within network spaces as a new spatial surrounding.

In a four-field-matrix Micheli summarizes the relationship between communication and labor markets using the variables of “person” and “Internet.” There, the role of communication changes from being very personal (within the person-to-person relation) and being rather impersonal (within the Internet-to-Internet relation). Within the sphere of information, any market can be categorized within this scheme. “Person-to-Person” work would involve less routine work, whereas “person-to-Internet” work would involve ways of learning that depend on social networks with personal initiative or self-learning elements. Even though the Internet itself is a network in which distance is unimportant, it is quite significant where the users are located physically. “Person-to-person” work would lead to localization being extremely relevant, and the work would take place within a local territory. On the other hand work addressed by the Internet would operate at a global scale (Micheli 2002, 16ff.).

This analytically described relation was also mentioned by some of the individuals I interviewed. They report about coworkers with “call center mentality” and distinguish this mentality from their own mentality, which they describe as “personal support mentality.” They think the kind of mentality an employee brings to the job depends on his or her personality. But they also mention that those colleagues who used to work for a company that was bought by their own company tend to have the “call center mentality,” because this is how the other company was set up. In their assessment, however, person-to-person communication is important and necessary for a great portion of their work process.

The restructuring of the labor processes is visible within global spatial changes of labor. The emergence of global cities has influence on the labor process. Concrete examples of global restructuring of labor are the outsourcing and off-shoring trends as well as working within networks and, particularly, how communication structures change within networks. There are other processes on a spatial level that do not operate on a global scale. The changing office space is a good example of how global development impinges on the labor process on a smaller scale as well.

4.3 Restructuring of Office Space

The restructuring of the labor process leads to a new role of offices, office buildings, and office space in general. More work is performed in offices than was done decades ago. Because of the different nature of office work compared to work in production, the office space itself is assumed to have an impact on labor performed. The productivity factor is one prominent argument concerning the impact of office space on work. Also, office space is increasingly considered a cost factor. Because of increasing mobility of workers and the new possibilities due to modern ICT structures, it is assumed that costs can be reduced with new office concepts. The above described suppositions have led to the development of new office concepts. Central in these discussions are the new possibilities of performing work tasks related to modern ICT. But also other aspects concerning economic changes on a global scale and general developments of the labor process are being addressed in office design. One important underlying theme when creating new office space is translating the connection between the increasing flexibility in labor into the character of the office as being more flexible as well. In the following section I will discuss problems that have occured in the field of the changing office concepts.

One underlying thesis of my analysis is that the restructuring of capitalist structure described in chapter 1 is reproduced in modern office constructions. It is important to point to these connections to illustrate how deeply the new capitalist structures are implemented in the reality of work for employees. Another thesis is that architects, designers, and managers are not critical enough concerning the functionality of the modern structures they are introducing. The influence of room and office constructions on the work performance is more complex than widely believed.

Generally speaking, when researching the relationship between office space and labor process, it is important to be aware of the complexity of the relationship. In the famous study called “Hawthorne-Experiments,” scientists tried to demonstrate an increase in productivity when improving the lighting conditions for workers. But the productivity increased in the group where the lightning was improved *and* in the control group with constant conditions. Scientist explained that the positive effects were a result of the attentiveness of the research group to these employees. Overall, it became clear that social factors possibly have more influence on changing workers performance than objective changes within a workplace (Kieser 2002, Fischer and Wiswede 1997). Despite this study, a general relationship between artifacts and social behavior still

dominates the professions that construct artifacts for workers. But it is reasonable to question these approaches and concepts and look behind general assumptions about relationships of artifacts and behavior. The following section about the changing office forms and concepts should introduce common concepts and the assumptions that lie behind them.

4.3.1 Modern Office Forms and Concepts

The cell or single office is the historical office model in Europe. In the United States the open-plan office was historical the typical office model, but this arrangement changed into group offices during the 1970s and 1980s. There, the advantages of the possibilities of teamwork were supposed to provide advantages, and the disadvantages were supposed to be eliminated [Figure 4.3-1 and Figure 4.3-2].

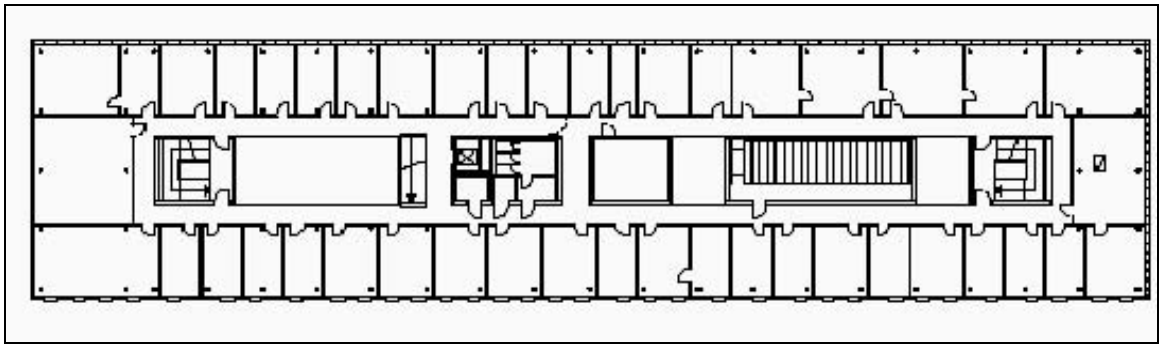

Figure 4.3-1: Cell Office (Staniek 2005, 57)

Figure 4.3-2: Open-plan Office with Cubicals (Mohr 2005, 11)

The so called combi-office was first developed in Scandinavia during the same time the group office was developed. The combi-office tries to combine the advantages of the cell and open-plan office. Depending on their work tasks, employees work in single offices, group office or in an open-plan area. Most combi-offices also have a meeting area where employees can meet spontaneously. Since the 1980s, the combi-office can be considered the most established office form, with applying a combination of both principles from both office concepts [Figure 4.3-3]. Staniek describes the business club as the result of enhancements to the combi-office. There is a great supply of rooms in a business club. The business club works ideally only in combination within non-territorial concepts (Staniek 2005). Another modern office concept is called the reversible office. Here, different rooms offer possibilities for a variety of very different requirements [Figure 4.3-4].

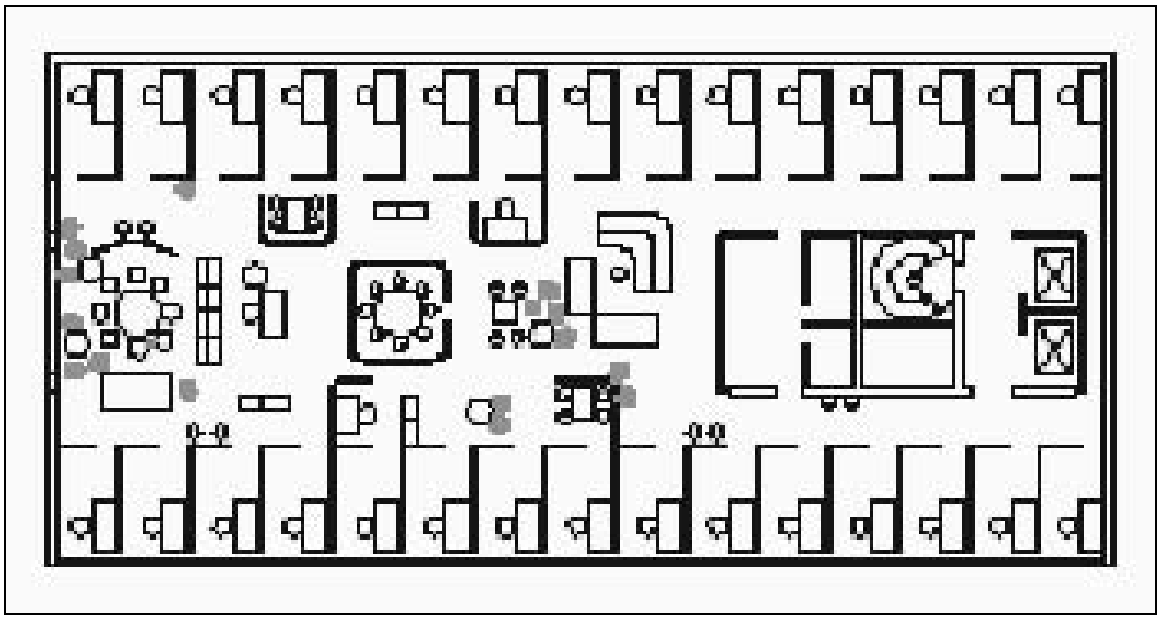

Figure 4.3-3: Combi-office (Eisele 2005, 47)

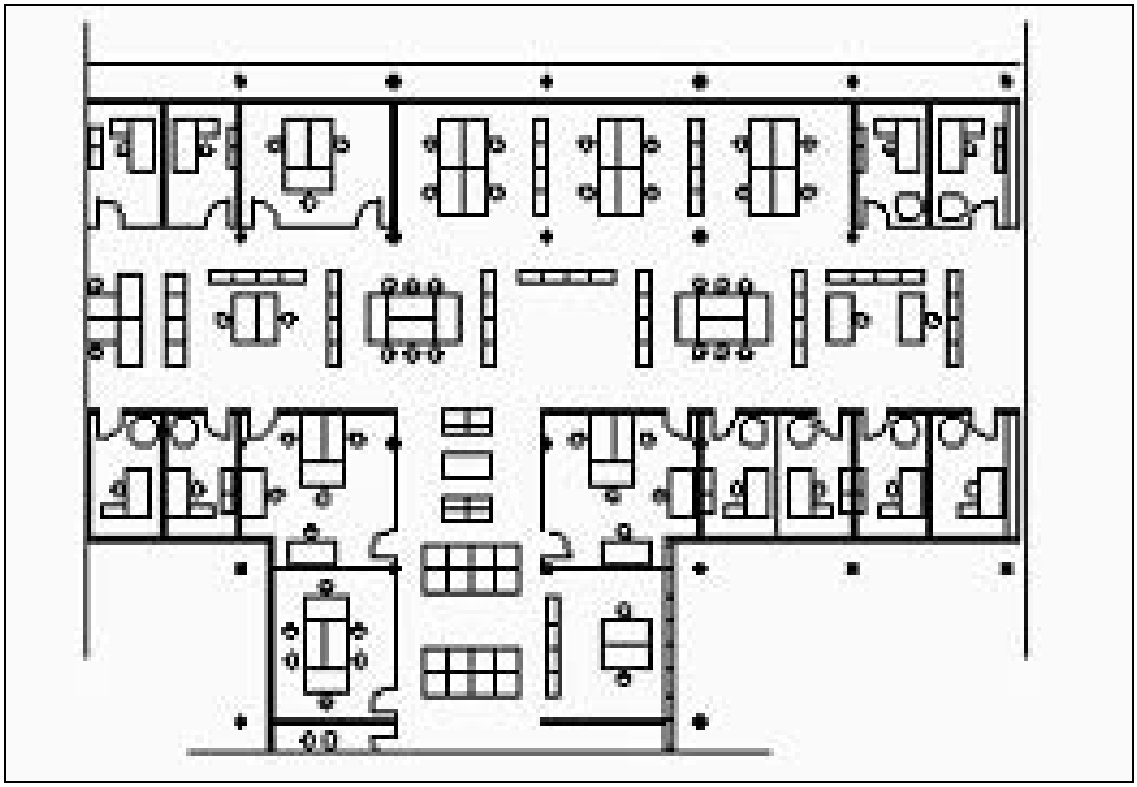

Figure 4.3-4: Business Club (Staniek 2005, 59)

Nonterritorial offices can be considered as the peak of modern office concepts. In this concept the linkage between workplaces and users of the workplaces is completely eliminated. Employees do not have an assigned office place anymore. When they arrive at work they get assigned to a specific workplace for that day or even for the next few hours only. In the evening they have to clear their desk, and it is not known where they will work the next day. The nonterritorial concept can basically be realized in all different kinds of office forms, such as cell offices and open-plan offices. Usually a nonterritorial office is connected with the implementation of a business club.[80]

Modern companies want to be as flexible and profitable as possible. At first glance, the office concept that provides the highest flexibility and highest profitability would be a combination of the reversible office with the nonterritorial office concept (Staniek 2005, 67). But taking a closer look we can observe that this is not necessarily the concept chosen by companies.

[80] Desk-sharing needs to be distinguished from the nonterritorial office concept. It refers to the situation where the desk is shared with other employees. This can concern one desk or one room. Only if desks in an entire building are shared is it the nonterritorial concept mentioned above.

4.3.2 Assessments of Modern Office Forms and Concepts

Generally, it becomes obvious that in the described approaches of flexible office forms and concepts the developments of informational capitalism merge. For example, higher flexibility and efficiency as well as a more intense control are reflected by the described modern office concepts and are also an element of modern informational capitalism. This implies criticism of these modern approaches. Also, how architects, designers, and managers implicitly transfer capitalist characteristics into office space need to be critically regarded.

Richard Sennett is a famous critic of the nonterritorial office. He attributes a high amount of naivety to architects and designers when designing flexible offices. The freedom that is supposedly created in virtual offices, for example, leads, according to Sennett, to an exclusion of the employees from the company's community. The employees do not have a location in their company anymore. This leads to the impression by employees that their employer does not value their presence anymore. In open-plan offices, for example, employees feel being constantly controlled by their supervisors. Sennett refers to modern office-planning architecture as "architecture of power." The economic organization of globalization is expressed within nonterritorial offices. This includes the superficiality of relationships, the missing loyalty of companies to their employees, and generally the velocity of markets leading to constantly changing forms (Schlüter 1999).

Sennett's critique does not address all kinds of "flexible" offices. He differentiates between "good kinds" of flexible offices that are modifiable (e.g., combi-office or reversible offices) from "bad kinds" of flexible offices like nonterritorial office concepts. He sees advantages in those offices that leave open choices and provide various different types of rooms. Those kinds of offices are relatively common in Scandinavia. Trends in the United States are in the direction of nonterritorial office concepts, which correspond to the trends in the labor process of high economical fluctuation (Schlüter 1999).

One aspect that Sennett does not refer to in his critique of nonterritorial offices concerns the possible connection between the specific tasks of an employee and his or her office situation. When planning nonterritorial offices it would be important to address and include specific occupational needs concerning spatial arrangements. This question is not addressed in any current studies about modern office structures (e. g.

Bullinger et al. 2000, Spath and Kern 2003, Popken 2005, Becker and Sims 2001, van der Voordt 2004).

Another critical aspect concerning the research about nonterritorial offices can be seen in the construction of empirical studies. All empirical studies about nonterritorial offices have a quantitative design but rely on a very small number (about 20) of participants. The 1972 pioneering study in this field relies on this small number as well as more modern surveys (Allen and Gerstenberger 1973, Brennan et al. 2002, Popken 2005, Zander 2005, Zander and Muschiol 2005). It is not surprising, though, that these studies come to contradictory results concerning the advantages of nonterritorial office concepts. Allen and Gerstenberger, Popken and Zander come to rather positive and optimistic judgments, whereas Brennan comes to negative estimations of non-territorial office concepts. Only Zander combines her quantitative approach with interviews, an approach that has the advantage of providing more robust information. More research is necessary concerning nonterritorial office concepts to find out more about the actual concequences of this type of work organization.

4.3.3 Case Study Examples

A very good example of the impact of reorganization of office space on the work atmosphere is the story told by the interviewed software developers from German Dev Corp about remodeling of their office building. Originally based on an anthroposophical background, the offices and desks were octagonal, the desks and shelves were made out of massive wood, and the carpet was made out of sheep's wool. The employees described their offices as cozy, friendly, comfortable, and practicable. They enjoyed the working atmosphere. The employee-friendly office concept supplemented other aspects of a corporate culture that greatly valued the staff, like high salaries, unusually good benefits, and an overtime account.[81] In describing the standing of employees in her company, Frau Schmidt said, "In this company the employee took the centre stage as an individual."

The reconstruction of their office building had already started in some parts of the building, where the management installed blue carpets and white desks. The German Dev Corp employees were not involved in the process of restructuring of the

[81] An account for overtime is a relatively new concept to manage working time. German Dev Corp introduced this concept relatively early. The overtime account cannot be exceeded. With more than 60 overtime hours the employee will be warned (follow up for more detail in chapter 7).

office building. Herr Klein reported that the management built a showroom demonstrating the plans of reconstruction, and employees could then object to the plans. He knew that two aspects, the blue-grey carpet and the cold lights, had elicited objections, but in response, no changes were made by the management. He illustrated his opinion about the rebuilding with the example of the conference rooms:

> "Today it [the old conference room] is cozy. The chairs are not pretty, but the rooms do not resound even though it is the same room. The tables [in the new conference room] are not movable and there are specific seating arrangements. Indeed, we have teetering chairs, but we are still happy to leave the new conference room as fast as we can after a meeting." (Herr Klein, 44 years old, German Dev Corp)

These changes symbolize the change in the company's management strategies in the company in the view of the employees. The new offices look like offices in any other company. And the management strategies are developing in this direction as well.

Another interesting case is represented by the office construction of US Stat Corp, which moved several years before into a new office building. In the new building the development staff works in single offices. Before, they had single, but also double and triple offices. Jim explains the process of building the new office buildings in the following way:

> "The development staff has single offices now, because it's much easier to work. Because we spend a lot of time thinking. Having interruptions is difficult. This building was built two or three years ago. They took this stuff into consideration. They ask people what they would prefer. The building before was much smaller. There we had single offices and double and triple offices. They had surveys, what people wanted, if people would be interested in a gym. For our work single offices are great, but for the sales department they would not want that, because they have much more informal conversation among themselves. Different departments have different needs." (Jim, 31 years old, US Stat Corp)

This example shows the importance of integrating employees in the restructuring processes. One of the already mentioned studies about nonterritorial office concepts had similar results. When companies include their employees in the planning of new office structures and concepts, it leads to an increase in satisfaction of their employees with their workplace. Thus it becomes likely that the productivity of employees increases as well (Zander and Muschiol 2005, Zander 2005). In addition, it shows the different needs of employees with different tasks. The group of software developers needs a solitary, quite undisturbed working atmosphere. The sales team in US Stat Corp, instead, needs group offices in order to exchange ideas informally and instantly. Their work progress

would suffer in a too-isolated and silent atmosphere. This last point, especially, is often neglected by persons in charge of office restructuring and researchers in the field. The development of modern office concepts may neglect the character of work and therefore miss important variables that would help in building appropriate offices for each employee.

4.3.4 Telecommuting and Office Space

After being hyped as *the* future work form during the 1990s there has been some disillusionment regarding the potential of telecommuting.[82] The theoretical possibilities of telecommuting are not fully used in reality. One problem of analyzing telecommuting is the lack of a consistently applied definition. Many different forms and variations of telecommuting exist. Therefore, the impact of telecommuting is different depending on what kind of work form is observed.

Generally speaking, telecommuting is an organizational form of a division of labor via telecommunication and at the same time it is spatial flexibility resulting from telecommunication (Dostal 1999, 65). Independent of what kinds of work forms are incorporated in the definition of telecommuting, a tendency toward increasing instances of telecommuting can be observed. Yet, this increase is much smaller than often predicted in the beginning of the 1990s.

Several different forms of telecommuting need to be distinguished. The original form of telecommuting is telework (German: "Teleheimarbeit"). This form is supplemented by the currently dominated forms of telecommuting: alternating telecommuting, centralized telecommuting, and mobile telecommuting. The table below summarizes the existing models of telecommuting and their criteria [Table 4.3-1].

[82] The German term "Telearbeit" does not translate into the self-evident "telework" or "telelabor." Telework is the specific model of telecommuting working solely at home (see definition of different kinds of telecommuting later in this chapter). The correct translation of "Telearbeit" is "telecommuting" which is the umbrella term of various forms of mobile labor.

TELECOMMUTING	
MODELS	CRITERIA
Telework	original model
	workplace at home
	problematic, because worker is isolated
	historically: often unqualified labor
Alternating telecommuting	dominant model
	workplace at home and at the company
	popular among employees and employers
Centered telecommuting	workplace neither at home nor at the company
	possible workplaces: satellite-offices, neighbor-offices, tele-service-centers
Mobile telecommuting	workplace at home, at the company and additionally at a third place or en route
	telecommuter is at any time connected with data and information processing of his or her company

Table 4.3-1: Models of Telecommuting According to Dostal (1999)

In Germany, 6 percent of all employees were telecommuters in 1999. In 2002, this proportion increased to 16.6 percent. In the United States, 24.6 percent were considered as telecommuters in 2002. In comparison to countries worldwide, the percentage of telecommuters in Germany was about average, and the United States was in second place, behind the Netherlands, where more than one quarter of all employees (26.4 percent) work as telecommuters (Kordey 2002, 8).[83]

The following table shows the comparison of different forms of telecommuting in the United States and Germany in percent of the active population [Table 4.3-2]. The percentage of mobile telecommuting and small office or home office telecommuting are more or less equal. However, the amount of permanent, alternating, and supplementary telecommuting is much higher in the United States.

[83] The most recent and substantial publication about the spread of telecommuting in several countries was presented by empirica. Among other material, they used data that were collected by the European Union project SIBIS – Statistical Indicators Benchmarking the Information Society (www.sibis-eu.org 2001-2003). I was not able to find more recent studies concerning the distribution of telecommuting.

TELECOMMUNICATING MODELS	UNITED STATES	GERMANY
Permanent and alternating Telecommuting	5.1 %	1.6 %
Supplementary telecommuting	12.2 %	6.3 %
Total (permanent, alternating, supplementary)	17.3 %	7.9 %
Mobile telecommuting	5.9 %	5.7 %
Small office or home office (SOHO)	6.3 %	5.2 %
Total[84]	24.6 %	16.6 %

Table 4.3-2: Comparison of the Amount of Different Kinds of Telecommuting in the USA and Germany 2002 (Kordey 2002, 18)

In the United States there are 1.5 times as many telecommuters as in the European Union. In all organizational models of telecommuting, the United States is among the first three countries. The United States has the largest number of self-employed working in small and home offices. In contrast, Germany has the highest rate of growth in telecommuters. The proportion of German permanent telework at home ranges in the mid range of all countries. Germany is in the top flight concerning self-employed working in small and home offices and concerning the amount of mobile telecommuting (Kordey 2002, 19).

Telecommuting is an important topic when thinking about restructuring of office space. Only a relatively small number of workers consider themselves as telecommuters. However, we need to acknowledge that many workers actually telecommute. They work at different places using the advantages of modern ICT. Indeed, working at different places becomes more convenient with the improvement of technology. The number of workers taking advantage of these new possibilities might also increase. It is important to keep in mind, though, that there were many occupations 30 years ago in which workers such as academics and journalists would take work home. In contrast, there are still many jobs where workers have to perform their work on the work site, such as those of salespersons, public officials, etc.. There are more potential applications of telecommuting that are yet being used. A study researching the potentials for telecommuting in middle-sized companies comes to the result that 49 percent of the tasks and 57 percent of the employees were eligible for telecommuting

[84] Because the various kinds of telecommuting models overlap, the given numbers do not add to the total percentage of telecommuting.

(Godehardt et al. 2000). All in all, telecommuting is not a new phenomenon, but its characteristics have changed due to the development of modern ICT.

Most discussions about telecommuting by the public and among management focuses on arguments concerning cost savings. The empirical research shows, though, that because alternate telecommuting is the most practiced and most popular kind, the cost saving is lower than widely believed. Alternate telecommuting places are not the most economical options of telecommuting (Seger 2005).

Most of the research on telecommunicating does not address specific occupations and the question of whether telecommuting works for the company or for the teleworker. There are several presumptions made about what kind of work and tasks are better for telecommuting than others. But specific occupations are not addressed. Chan surveyed IT professionals[85] and how this occupation is predestined for telecommunicating. Even though it would seem that the IT profession would complement telecommuting very well because IT workers are familiar with technology, Chan concludes that there are several problems that accompany telecommuting for IT professionals. IT professionals need to work in groups and communicate with colleagues a considerable amount of time. In addition, telecommuting possibilities differ with the size of the company (Chan 1997).

In a recent study Metzger et al. (2003) looked at the impact of telecommuting on the identification with the company. They were specifically interested in if and how telecommuting has an impact on the identification of the employee with the company, and in a second step they tried to identify the factors that are relevant in that process. Metzger et al. found a general positive correlation between telecommuting and organizational identification. Most important determinants influencing the organizational identification are attractiveness of the work tasks and the autonomy of work. Telecommuting affects both determinants, yet only the attractiveness of the work task correlates positively with the organizational identification. In contrast, the autonomy of work has a negative impact on organizational identification. A greater autonomy leads to more independence and self-determination, which leads to a weakening of the relationship to the company. Nevertheless, the general relationship

[85] IT professionals researched in Chan's study were "people who support the development of IT projects, people who support the provision IT, or people who support the maintenance of life information systems by utilizing their proficiency of IT skills or techniques" (Chan 1997).

between telecommuting and organizational identification is positive (Metzger et al. 2003).

Overall, an underlying assumption behind changing modern office structures is that communication possibilities will improve. This is important because modern work tasks require good opportunities for communicating. Planners are certain that their flexible office concepts support spontaneous communication. An aspect that might or might not be intended by planners of these office models is not only that communication is supported by these concepts, but also that an increasing possibility of control emerges. In addition, it needs to be taken into account that in almost all instances, decentralization of office work affects "back offices." Back offices are mostly affected by changes on this spatial level of restructuring of the labor process. "These are precisely the activities that employ the bulk of semi-skilled office workers, most of them suburbanite women, many of them replaceable or recyclable, as technology evolves and the economic roller coaster goes on" (Castells 1996, 385).

4.4 Result: Flexible Labor Merges in Space and Place

The previous analysis has shown how flexible labor merges in space and place. Evidence of how space creates flexible labor structures was shown on the global (global cities), organizational (networks), and artifact (offices) level. But this conclusion is somewhat restricted, because we have also seen that space is not totally flexible, just like labor is not totally flexible. However, it has become obvious that modern capitalist structures form spatial arrangements. The coexistence of centralization and decentralization described in chapter 1 on an organizational level can be applied to the spatial level. Space changes within the labor process and is becoming more and more important as a dimension of research as well as a dimension considered by employers and employees. But despite the fact that it is obvious that space and place play an important role in the labor process, it is less obvious how these changes take place. Much that is thought to be new (being reachable at home, working at home) are aspects that have been around long before the Internet became important. But the clearly defined expectations by the management and the implicitness of these possibilities accompanied by modern technology are new.

Regarding outsourcing and off-shoring, internationalization has taken place in the hardware industry for decades, but with the outsourcing activities starting at the end

of the 1990s, we can talk about a new phase of spatial restructuring that is being expressed in the current debate about off-shoring (Boes 2005a, 22).

Regarding the emergence of business and social networks it became clear that there is a flexible coexistence of modern network and old-style organizational structures. In addition, communication is an important variable that functions differently in networking structures than in other organizational structures.

Modern office spaces are a good example of the nonconstraining impact of capitalist approaches on the labor process. On the basis of nonterritorial office concepts and telecommuting the merging flexibility in office surroundings was discussed.

Overall, when researching the dimension of space within the labor process it is becoming obvious that German research about labor lacks important insights from the spatial sociology. The stronger interdisciplinary approach within the US sciences leads to a greater openness towards spatial theoretical approaches in the field of labor studies. Analyzing the role of space within the restructuring of economy is a prime example of the importance of interdisciplinary approaches in examining modern developments. Especially because many preconceptions about the role of space and place exist concerning modern restructuring it is important to follow up in this area to contribute to more knowledge in that research field.

5 Work

The following chapter discusses a further dimension of the labor process which is simply labeled *work*. Again, work needs to be distinguished from employment and includes activities of the labor process that people are engaged in. As mentioned in chapter 2, the dimension of work is often neglected when considering overall or gross changes within the labor process and labor markets. However, my underlying thesis is that this dimension is becoming more and more important in order to explain the actual changes within the labor process. One reason for this increasing importance is the growing role of ICT in the labor process. The actual work process becomes highly complex and intensive and is an important aspect to understand current changes. The aspect of increasing reflexivity, an important one in the dimension of work, needs to be addressed in future research, as little empirical information is available about it, although some researchers have addressed it. Obtaining empirical evidence in my research proved difficult as well. Because the topic of reflexivity is relatively abstract and therefore not intuitive for those I interviewed, I was not able to obtain evidence within the limited amount of interviews. Even though I tried to get information about this topic, most of my interview partners did not talk about aspects that point at increasing reflexivity within their work.

Several topics are important to consider within the dimension of work: the role of skills, knowledge, education, and training, the changing role of workers' communication and tools, and the important role of market forces on everyday tasks.

5.1 Demands of Flexibility on Education, Training, Skills, and Knowledge

The underlying argument that the role of education, training, skills and knowledge is an important aspect of the dimension of work is that the skills and knowledge required to do work in IT occupations is not effectively captured in formal education and training programs.

Regarding the education of software developers, the social status of those who decide to study computer science is remarkable. In a study about software developers Hartmann (1995) discovers that the social background of those who study computer science is manifold. Thus, individuals from very different socioeconomic backgrounds decide to study computer science. This is different in traditional fields like law or medicine. Students studying law and medicine, for example, usually have highly educated parents. Therefore, Hartmann concludes that computer science is a less selective program concerning the socioeconomic background than this is the case for

traditional study programs. Hence, the socioeconomic background of individuals starting a career in the software developing field is broader than the social origin of law or medical students. Interestingly, though, working as software developers only those with a well socioeconomic background move up into high management positions. Transferred to social theory a high socioeconomic background is associated with possessing much capital. Therefore, capital is still important for getting high positions in the IT field. But the role of capital and labor is not that obvious in the IT field than it used to be for traditional occupations when considering not only the professional career but also the education of IT workers. With this research result Hartmann disagrees with the views of other theorists who argue that education replaces the important role of capital as a social class, but Hartmann argues instead that education rather stabilizes the role of capital, because it adds an additional legitimation to the recruitment process (Hartmann 1995, 162). Considering the education of IT workers and its flexible elements this argument is important concerning two aspects. First, the starting point of a professional IT worker career is different from that of a traditional profession such as lawyer or doctor. That more people find access to the field of computer science in the first place can be considered a flexible element in the education of software developers. Over time, meaning after finishing their studies and when working in their field, this flexibility does not continue to apply. Then, the career paths of highly qualified IT workers depend again as much on the socioeconomic background as it is the case in traditional careers (Hartmann 1995).[86]

In informational capitalism, specific topics are becoming almost impossible to teach in a formal, theoretical matter. Today, more than ever people have to gain experience and learn on the job. Much of the practical knowledge that is needed in the work process today cannot specifically be taught. A theoretical background is necessary to perform the today's work tasks, but those involved in the process find this background inadequate. One of the software developers I interviewed explained, for example, that from what he experienced with young coworkers computer science is too academically oriented and "needs more interplay with actual industrial work." But he also emphasized that software developers have to continue to learn on the job.

[86] This study is about German computer scientists. Therefore, there is no empirical substantiated statement possible about the US situation. However, it stands to reason that these developments are similar in the United States, where traditional careers also depend on socioeconomic backgrounds.

> "Persons at the computer development work learn constantly – have to relearn, learn new things, new techniques, and tools. It is a different type of work. The tool changes but the references remain the same. … We do it on the job. Now there are companies that provide training on new developments and they include trainers in the company and they have a training session. That is another way of keeping up with the problem. … But you probably learn more on the job. Although now that with the computer science departments in universities students go through the whole process learning the tools and techniques at the university. Even though they come to work for a company such as the US Stat Corp, they still have to keep learning." (George, 82 years old, US Stat Corp)

Even though German universities are divided into applied and theoretically oriented universities, the applied universities are still viewed as too much theoretically oriented. Herr Meier, for example, judged it as important that he was able to work during his studies, because of the practical experience he gained during that time. Adapting the contents of education to the needs of the labor market is very important. Combining theory and practice is a kind of flexible development that is needed more in contemporary education than ever before.

The role of formal education differs between Germany and the United States. There are several dimensions that are important to recognize when comparing the role formal education plays in Germany and the United States.

The first dimension is availability of workers. The importance given to educational degrees depends on the availability of qualified people. Because in Germany a higher education (beyond a bachelor's degree) is generally more widespread than in the United States, an advanced degree is what employers look for. In the United States many people stop their education with the bachelor degree. Therefore, employers tend to be satisfied with that degree. In Germany, only recently have students stopped their education with a bachelor degree. It is not clear yet if they are going to have better or worse chances in the labor market than the traditional diploma graduates have had.

The second dimension is the difference between the value given to experience and formal education. In the United States, experience seems to be more important for career opportunities than is the case in Germany, where formal education is more important for job applications and promotions. So, if you consider formal education a rather inflexible way of learning, this means that the United States has a more flexible way of handling education concerning career opportunities.

Third, training is more important in the United States than in Germany. This is circular, though, because if formal education is less important in the United States, training is necessary to compensate for it.[87]

The case of German Dev Corp illustrates the changes within the training system of companies within the ICT sector in Germany. A few years ago German Dev Corp still had specific training sessions for newcomers. These lasted about six weeks and introduced many products and topics relevant for the company. These training sessions do not exist anymore. Now, newcomers have to learn on the job. German Dev Corp has installed specific short-term training programs for experienced developers instead. For example, the company implemented a new training program for the so-called special developers (a position title that represents the third level of developers) to become architects (the fourth and highest level of developers). These are more specialized training programs aimed at high performer of the company.

Frau Schmidt emphasized that she and other employees have independently trained themselves. Because she is not very much involved in technology anymore and does not think she will go back there again, she is now independent from the company trying to learn about management issues.

The shift in training focus, both at the company-level at German Dev Corp and at the individual level with Frau Schmidt, reflect high flexibility within training and learning. There are fewer training programs, and they are more specialized. Employees are forced to flexibly deal with gaining new skills and knowledge on a private level.

In the past job tenure also meant having more knowledge in the company and for one's tasks. That relatively long-term employment no longer means that the employee can build on his knowledge and skills was expressed by Jim in one of my interviews, when I asked him the following question:

> "Do you think you need to take less time for learning today than ten years ago, because you have more experience?"
>
> "Definitely not less. … [I]t's never ending …. I mean, I guess you could stop and just be where you are at. But that's not a very good career path, you know." (Jim, 31 years old, US Stat Corp)

Several years ago, people had to become acquainted with their jobs when they started. After a while they basically knew their tasks and had the knowledge to do their

[87] Based on the information of my Indian interview partner, the German situation concerning the role of education seems to be fairly similar in India. There, they have high-skilled IT professionals and concentrate more on education than on training on the job.

job. Today, and especially in the field of ICT, this is different. People have to learn new things on an almost daily basis. If they stop learning they will not be able to perform their work satisfactorily any more after some time. Today they need to know how to learn new things quickly. Thus, increasing flexibility comes into play, because flexible handling your skills and knowledge and reacting to change becomes very important for employees.

Herr Pfeiffer hit a good point when talking about how he learned on the job by doing his tasks. He said that he had a great deal of responsibility in his job from the very beginning, and that helped him to learn quickly. Compared to what he learned in the training program he had, he learned much more when performing his work tasks because there he was pushed by his responsibility for the company and the customers.

The case of US Trad Corp illustrates how companies deal with the topic of education and training today. They are aware of the fact that their employees need training and further education in order to perform their job in a highly qualified way. Before employees start working for US Trad Corp they are informed that there will be a lot of training possibilities. The employees take advantage of these possibilities in the first few years of their employment. After they have worked for the company a certain amount of time, however, they no longer take advantage of the training possibilities. They are overwhelmed with tasks that have to be done, and there is no more time for training. Nevertheless, the employees still talk about the great advantages they have because their company offers and provides so many training possibilities. During the interviews the employees recognized this, when they were actually asked when they have attended their last training. At first, they rhapsodized about the perfect possibilities and later they noticed that they seldom took advantage of them.

The training provided by US Trad Corp not only gives the employee the possibility to learn and improve his or her skills, but is mostly project oriented: therefore the company may have an even higher benefit from providing the training than the employee has from receiving the training. Because the technology changes fast, the employee needs to continually learn. In case he or she is laid off, though, formal and diversified training might be more helpful for finding a new job, than the specialized project oriented training. In the beginning, when Vivek was new to the company, he took online college classes to improve his skills and knowledge. As he developed

experience in the company he had very limited time for this kind of training. Now he attends only project oriented training.

> "I am trying to focus on training that is needed for the company, for the product." (Vivek, 29 years old, US Trad Corp)

The training situation at US Trad Corp shows how both companies and employees are flexible regarding education and training. They increasingly adapt to whatever knowledge and skills are needed in a specific situation. Project-oriented training is considered as a highly flexible form of learning. But with this kind of training the advantage for the company could be bigger than for the employee. Employees tend to concentrate more on their companies than on their personal goals when choosing the training programs.

Overall, the lack of formal training and the necessity of learning on the job lead to an increasing dependence of employees on their company.

> "I certainly have learned more by doing than I probably would have by reading. I could not pass in Oracle anything that would qualify me to say I could put Oracle on my resume, same way with UNIX, but I can function." (Tom, 53 years old, US Trad Corp)

Employees constantly learn on the job. But they are gaining knowledge of specific work tasks for their particular project. Without formal training they do not earn training and education credentials that they might need if they want to move on to the next company. As stated before, the employers are somewhat alienated by the fact that potential employees are not able to provide training and education credentials. In practice, this means a decrease in flexibility from the perspective of the employee regarding his or her opportunities for changing jobs. Therefore, contacts and references play an increasing important role to win back some flexibility (this will be discussed in more detail in chapter 6).

The following quote from one of my interview partners at US Trad Corp illustrates the specific consequences of immediately working with modern technology.

> "When I worked in [name of company], before I moved up here, I was very frustrated one day because my boss asked me to do something and I did not know how to do it. And we sat and we talked and he said something to me that I will always remember: '[Susan], I ask you to do this. And I don't know how to do this either. I ask you to learn how to do this. The technology I am asking you to work with, maybe has not been invented yet. You might be the one to do that and once you do that and the technology you are using today will not be used in five years. You are in a new and growing business and in order to stay ahead of the game you are always going to invent new ways to do it. So, I might ask you to do something I don't know how to do this either and you gonna learn

> something in five years from know and it's gonna be old head and everybody is going to use it and it's not gonna be important anymore.' I try to keep that in my head when I get to a new position, I get to a new task. No one has done that before, so I have to figure it out. … So the stuff I learned in school was ten years ago. It's old knowledge now. It's old technology now. If you want keep moving technologically you always gonna be using something new so you always gonna be learning. … Because what I am gonna be doing in five years from now we have not invented yet." (Susan, 44 years, US Trad Corp)

My German interview partner from German Dev Corp also talked about the creative and innovative aspects of his work:

> "Rarely do we have something specified, how it should look like. Rather the point is that they tell us this and this functionality is missing and we need it. And then I need the foresight to find out: What do they mean with that functionality? What do we need to do for it? During these research activities I learn a lot already. And what I invent I usually also have to build in. And doing this I learn again." (Herr Klein, 44 years old, German Dev Corp)

There is a high demand on software developers to be constantly innovative. In addition, the work of software developers is influenced by constant changes of customers and tasks. Even software developers who have a lengthy tenure at their company usually do not stay in one position for longer than two years. They are used to constant changes and new challenges. My interview partners explained that they like this because otherwise they would become bored.

The role of skills for the work process was also researched among "new media" professionals in New York City (Batt et al. 2001).[88] The results of this study give several important hints on the role of skills in this kind of profession. It became clear that skill obtainment is an individual responsibility among new media professionals. The professionals were largely self-taught and on average spent 13.5 hours a week in obtaining new skills, which they mostly did alone. Interestingly, men, older workers, and supervisors spent the most time in learning on and off the job. For this group of professionals education and training are not formalized.

The lack of formalized skills is especially problematic for new media employers, because they do not know what skills the professionals whom they hire have. For that reason employers often recruit locally and rely on informal approaches. They use professional networks to gain information about potential employees.

Skill shortage is the biggest problem for companies in the New York City new media industry. The industry has is a fairly high pace in which skills become obsolescent. Batt et al. (2001) therefore suggest that better access to skills training is the

[88] The study included 335 respondents and was based on a quantitative research design.

most important policy response to these conditions. It is remarkable how enormously obscure and complex the employees' range of possessed skills is for employers within the new media industry in New York City. Even though the empirical results of this study are limited to this area and that profession, the trends can be transferable to the IT industry as a whole. Not only does the employee deal with constantly new requirements, the employer as well faces problems arising from this situation. Employees view learning as a large portion of their everyday tasks, and employers use their networks to compensate for missing training credentials. The role of skills is highly complex, and an extremely flexible and open acquaintance with the situation is necessary for employees as well as for employers.

In line with these results are indications that software developers do not promote an increase of professionalism in their occupation. They do not set specific standards within their study programs, but instead pursue their individual careers which are independent of a standardized professionalism. They even lose their professional background in order to move up the ladder and do not mind that this happens, because career advancement often involves taking on more management tasks rather than acquiring more technical knowledge (Hartmann 1995, 161ff.). This differs from other career paths where only professional, specified knowledge and experience within the original field helps in being successful and moving up the ladder.

The interviews conducted for this study confirmed this development. Ten years after starting their professional career, software developers moved into management and away from the technology when advancing their career. Even though two companies officially offered two ways to move up within these companies, one path focusing on management and one directed into more intense technical specialization, comments from the interviewees indicated that they viewed the management career as more valuable. The following quote from one of my interview partners who chose the technical career illustrates this situation. Concerning the question about teamwork and how problems were being solved, he said:

> "When you sit at the lowest level, like me as a developer, then it is always easier to take action on the problem that needs to be solved than to go to your boss and ask him to ask someone." (Herr Klein, 44 years old, German Dev Corp)

Even though Herr Klein is a senior developer (which is the second highest level he can reach as a developer in the company) he judges himself as being on the lowest level. The team leaders I interviewed are on the same level as Herr Klein – taking into account the two possibilities of career paths in the company – but definitely see

themselves as part of the management and therefore at a higher level than they worked at before. Herr Klein without doubt has very advanced professional knowledge and is very valuable for his company, but his self-assessment does not correspond to this. Also, the information he gave concerning his working time shows that he does work flexible hours but that he usually works about 40 hours a week and is not expected to work overtime, in contrast to the team leaders, who are much more forced to work overtime. If overtime is understood as special commitment to the job this shows the different level of prestige of both kinds of careers within German Dev Corp.

For many aspects of the work process collective learning is important. This becomes especially apparent in a region where learning and working processes are highly networked. In Silicon Valley, for example, employees draw from resources of the region instead of concentrating on knowledge within an individual firm (Saxenian 1996). This example from Silicon Valley indicates that this kind of learning could get more and more important in other regions and that those regional relationships might get more important to the extent that firm boundaries loosen. A different approach to learning is being demonstrated in Silicon Valley, where learning takes place through experimentation and even through failure, not only through success. There is high acceptance of learning as an iterative process and as a flexible process of ups and downs. This tolerance of failure is not as common in other areas of the United States as much as in Silicon Valley. In Silicon Valley there are widespread opinions that from failure people learn to be successful later in their career. The combination of individual initiative and technological advances is most important for success in Silicon Valley. Given the intense social and professional networks individual initiative and technological advances are considered a precondition for access to information, creativity, and experience (Saxenian 1996).

> "In short, the region's social and technical networks operate as a kind of super organization, through which individuals, in shifting combinations, organize a decentralized process of experimentation and entrepreneurship. … In Silicon Valley, the region and its networks, rather than individual firms, are the engines of technological advance" (Saxenian 1996, 30).

That attitude towards learning in Silicon Valley will also be important for other regions. The comparison of the developments of another high-tech area, the so-called Silicon Valley of the East Coast, the Route 128 in Massachusetts shows that companies

in that area face major problems because of their traditional organizational structure. There, the firm boundaries and internal labor markets are still very common.[89] The requirements of today's global economic developments do not agree with compartmentalization and internal moving up the ladder structures. Network structures in this region have been built only within a firm not between companies. Important knowledge, skills, and experience are not shared in this kind of competitive atmosphere, and success is difficult to achieve. Even though the case of Route 128 shows that Silicon Valley's organizational structures are helpful for the companies to stay competitive and be successful, for the companies it remains unclear "to which [extent] this model of open labor markets embedded in social networks will be diffused" (Saxenian 1996, 37) in the future. The example illustrates, though, that flexible network structures at the level of learning are necessary in informational capitalism.

Another important aspect of the role of personal knowledge within modern work processes in informational capitalism is the dependence of employers on employees and how employees judge their personal importance to their employer. On the one hand the companies depend on the knowledge of their workers. On the other hand they pretend that all their employees are replaceable. Their corporation culture prevents employees from feeling to secure about their employment.

> "If you would leave the company, how hard would it be to replace you as a person for the company?"
>
> "Well, in reality the company outlook on this would be that everybody would be replaceable."
>
> "What do you think?"
>
> "They would survive. Certain things would not be done in certain ways or as well. But ultimately no, I don't regard myself to be irreplaceable. You can't afford it, because if you do, you act too arrogantly."
>
> "Would there be a lot of knowledge lost if you would leave?"
>
> "Yes there would be. But that's their choice." (Tom, 53 years old, US Trad Corp)

In sum, the changes within work suggest an increasing flexibility within the field of learning. This manifests itself in the constantly changing demands and the growing

[89] In chapter 6 the role of internal labor markets is discussed more elaborately. There it will become clear that there is not necessarily a contradiction between importance of internal labor markets and increasing network organizations.

importance of lifelong learning. The complex problems that employees face at their workplace lead to high requirements by the employers. These can only be accomplished through intense and flexible ways of education and training providing workers the possibility to flexible use their personal skills and knowledge.

5.2 Communication and Tools

> "That's a good question: How do you communicate? … We are still figuring out what is the best way to communicate. We are growing and it's hard to communicate all the stuff that needs to be communicated to everyone." (Jim, 31 years old, US Stat Corp)

In discussing the role of communication and its tools in informational capitalism, my underlying thesis is that communication is important and is getting very complex in current work. Further ICT cannot be considered simply as a tool because it changes the nature of work activities. Existing theories do not capture how ICT shapes the complexity within communication today.

Jim from US Stat Corp differentiated between formal and informal communication, the latter being more important for his daily work process. He describes the standard, formal communication within his company as very organized. For every milestone the company has some kind of formal communication. Informal communication in his company is more detailed. There is a lot of informal communication among software developers. Informal communication is according to its underlying definition not organized, but the company and more directly the employees organize some aspects of their informal communication via a technical wiki system.[90] Recently the company implemented a knowledge management system[91] for the entire company that will replace the wiki system. The wiki system was predominantly used by the software developing staff, because they are familiar with the technology. The knowledge management system, which was lauded by my interview partner Jim, is addressed to the entire staff. This is an example of how the way communication is organized and the applications of ICT increasingly interact. Especially for organizing informal communication, the technological systems seemed to be supportive. Therefore, we can observe a formalization of informal communication which is based on technology.

[90] A wiki system is an information system with the possibility for users to change the information. It is therefore similar to a content-management-system. It is available online, for example on the World Wide Web.

[91] There is a short paragraph on knowledge management systems in chapter 6.

One important reason for the change of communication structures is the growth of US Stat Corp, where formal communication is highly complex today. This fits into the picture that will be described in more detail in chapter 6. Successful start-up companies need to implement more bureaucratic structures in order to handle their growth. The flexible aspect of organization is the interaction between informal and formal organizational structures.

I asked my interviewees to describe the role of modern ICT in their work process. In that context George differentiated between the computer and the Internet. He described the computer clearly as a tool that helps make his work more productive, convenient, and faster. The Internet, however, changes the nature of his work. With the Internet information without interaction with other people is much more available. But there are limitations in the value of the Internet:

> "It is too much information available. One can be overwhelmed. You have to be selective. Just find out what information you really need to know rather than spending a lot of time browsing around to get new ideas" (George, 82 years old, US Stat Corp).

This statement by George suggests that direct communication becomes less important because the needed information is provided by the Internet. However, direct communication remains an important aspect in current work processes. Despite email, chat programs and the like the direct contact and exchange with coworkers remains important. This was confirmed by all of my interview partners. George, for example, also commented:

> "The contact of coworkers is important, also we could use email and online-chatting, but it's important to meet them, because we do different portions of a major project." (George, 82 years old, US Stat Corp)

Another interview partner described email as a tool and emphasized that it does not replace direct communication.

> "Email is a tool, but it is not a replacement for direct communication. It's a crutch. It's a tool. There are guys I can communicate with email very well, but with some I can't. Some won't understand if I say it in an email. In general, it is good to talk to people. It is important to talk to people. You can't rely on email." (Tom, 53 years old, US Trad Corp)

Tom from US Trad Corp expressed how talking to people face to face remains important despite the availability of technology-based communication.

> "How important is it to meet with people?"
>
> "Oh, I think it is very important. That is one of the reasons I need to travel is because I need to spent time in front of the customer. You cannot always do

> weekly conference calls and expect to maintain the relationship. You need to talk directly."
>
> "What about the people you work with?"
>
> "I think if you establish a very good relationship personally, then it is easier to maintain the relationship electronically. And you have to maintain that relationship, too. So you do need physical, face-to-face contact - virtual office is nice, but the reality is: You still need a connection." (Tom, 53 years old, US Trad Corp)

My interview partner Vivek stated that not much project work is done on the Internet. But the learning part of the work, if he needs to search for something to learn about a new technology or if he has a question, is done via the Internet. The Internet is used not only as a one way resource option, but also as two-way communication resource. Overall, the computer as well as the Internet cannot be described only as tools, but they need to be recognized as artifacts that have an impact on the nature of work.

In line with other researchers who argue that a major change within modern labor processes is due to the influence of ICT, the aspect of digitalization is most important for Micheli. He emphasizes the role of a changing communication that comes along with digitalization.

> "The digitalization of the raw material of information not only implies velocity and ubiquity - characteristics of the Internet - but also a new language. We are speaking here of the field of communication, and what we find is an economic (labor) transformation linked to a communication transformation. Linking these two characteristics is one of the analytic tasks that will facilitate an understanding of the profound nature of the changes revolving around Internet technology and labor restructuring. 'Digitalfacture' is a labor innovation that combines the trajectories of flexibilization and changes in digital technology in the direction of its communicability. ... [W]e have demonstrated aspects of labor evolution that provide the content for the knowledge society, as well as empirical examples of digitalfacture work in which we can observe the link between flexible labor and digital competencies, and the transformation of information to knowledge"(Micheli 2002, 17).

Concerning the direct influence of ICT on labor, Micheli develops a new construct of labor referred to as digitalfacture. The technologic tools and the changing role of communication are reflected within this construct. More specifically, the restructuring of labor is noticeably connected with the development of the Internet. Communication and its tools play a major role in this development, having direct impact on the actual activities of people engaged in the process of production.

5.3 The Daily Market Force

A market is a highly flexible way of organizing something. The penetration of the market specifically into work activities is a sign of the complexity and flexibility of contemporary work processes.

The following quote shows how the market has major impact on the daily tasks of the workers.

> "Can you please describe your typical regular work day?"
>
> "In the software industry there are cycles, release cycles. There are several stages. At first, there are the planning stages. There you basically do brainstorming; you come up with new ideas of the project. This also goes to customer's feedback. We try to find out what the customers want to buy. We think about design features. What is the program going to do? What is it going to look like? This whole process is very iterative. Because when we are through a piece of it we then have to go back, because some things don't work. … A typical day depends on the cycle. At the moment we are just fixing mistakes and stuff." (Jim, 31 years, US Stat Corp)

In their daily work, software developers are bound to industry cycles in such a way that they cannot control their tasks independently but that are influenced by much broader market issues. The industry cycle is one aspect of the market influence. This fact itself it not very surprising; the increasing influence of the markets on the actual workplace has been discussed broadly (e.g., Castells 1996). But this quote from Jim of US Stat Corp shows how naturally this phenomenon is understood by the workers themselves. A regular workday is not organized by the worker or by their managers. Instead, it is the market that structures their daily work. The workers put up with this because it is nothing special for them, it goes without saying. The implicitness of this issue for the workers is what is not expressed in many recent studies so far. An exception is the study by Richard Sennett (1998). One of his focuses is how economic changes are experienced by employees. In one of his case studies he portrays the development of working conditions in a bakery. The enormous influence of the market on the bakery and, with that, on individual workers, their tasks, and the hierarchical order becomes obvious. Workers in the process of flexible production only experience the surface of their work tasks. They are unable to understand the logic that lies under the surface in the profoundness of activities, and as a result their work tasks become illegible for them. The increasing use of complex technology is one reason for this illegibility. Through the illegibility, the reaction and dealing with unforeseen events becomes very difficult and the identification of the employees with their work tasks diminishes (Sennett 1998).

In Germany, researchers in the field of sociology of labor introduced the concept of the employee-entrepreneur (German: "Arbeitskraftunternehmer") (Voß and Pongratz 1998).[92] They use this concept to describe the personal changes of employees who start acting as entrepreneurs, even while they are working under an employment contract for a company. The direct impact of the market on the worker is expressed within this construct. The authors describe three basic characteristics of the employee-entrepreneurs. First, a higher need for self-control of the worker can be observed. The reduction of control by an outsider is accompanied by new strategies for indirect operative control as well as an intense pressure to perform. Second, the employee-entrepreneur needs to redefine his or her relationship toward his or her own ability to perform. This means that they need to intensify the promotion of their own person and with that increase their value as a worker. They need to become increasingly oriented toward efficiency. Third, the authors propose that the relationship between work and private life will structurally change. The employee-entrepreneur will consider labor important concerning his or her overall life set-up. The authors see the enormous increase in individual, not work-related organization- and communication technology as one important indication of the development toward a high number of employee-entrepreneurs. Voß and Pongraz's analysis concentrates on the consequences of organizational changes, especially how employees' attitudes toward their work changes. The authors focus on the explaining of the new social status of workers due to the loosening of boundaries between work and private life. The effects on the social status of employees due to the evolving of this new kind of work force are rather ambiguous. More possibilities of a satisfied work life come along with a potential of a decline in employment, because the increasing influence of the market leads to an increasing power of employers over employees.

How the process of increasing influences of market mechanisms also affect the work of freelancers and entrepreneurs becomes obvious in a study by Gerlmaier (2002). Gerlmaier studied new forms of work organizations with the increase of self organization in Germany. In this psychologically oriented quantitative study of 224 IT professionals, she compared two different kinds of so-called new self-employed (freelancers and entrepreneurs) with more traditionally oriented employees. There are

[92] Their analysis is built on qualitative empirical data conducted in the context of the Munich Collaborative Research Center 333 as well as on personal experience of one of the authors as management coach.

clear group-specific differences in aspects of curtailing of feelings as well as concerning resources for working. Concerning health, she found clearly more symptoms of exhaustion with entrepreneurs. Freelancers fought with sorrows about the future and the compatibility of work and private life more than this was the case with traditionally oriented employees. They experienced both a high inability to recover and a reduced level of work-life balance. Interestingly, this did not result in tension because of listlessness but corresponds to rather high levels of satisfaction regarding work topics. The tasks that were carried out independently corresponded to higher external needs due to more intense market pressure than in activities that were performed within a traditional organization. These and other results of the survey led to the question of whether entrepreneurs really experience a higher amount of freedom and corporate responsibility compared to people working in more hierarchical structures. Freelancers and entrepreneurs face higher exigencies of flexibility and self-organization because of higher market- and customer-oriented working conditions. These needs for flexibility often do not bring more freedom and a greater possibility for interaction, conditions that would help to handle the new exigencies. Generally, the study showed that stress factors are mainly due to pressure within work and long working hours in combination with high self-organizational necessities and emotional requirements due to the contact with difficult costumers. Therefore, Gerlmaier concluded that training in self-management and conflict-solving competences should be implemented within these occupations, and additionally that project management should be optimized (Gerlmaier 2002). The need for constantly considering the work process and its results through a high amount of personal orientation on the job is clearly a challenge for entrepreneurs and freelancers. Only by staying flexible in this context are they able to handle their work process properly.

Jim's previously presented statement about his typical work day being oriented to industry cycles represents the very limited personal influence he has on the arrangement of his work day and organization of his tasks. This supports his further remarks that his working time is not regulated but depends on the release cycle. Another example was given by Vivek from US Trad Corp. He confirms the direct impact of the industry on the daily work organization and tasks:

> "[The schedules] work out, but then the whole software industry has a lot of slips. Because we have current customers and they come up with their issues and then it takes us sometimes two, three days before the issues resolve. So assuming we don't have any interruptions we usually kind of stick to the

> schedule. But then I don't think there is any company that can stick to their schedules." (Vivek, 29 years old, US Trad Corp)

Despite the fact that schedules cannot be maintained within the industry because of pressure from outside schedules; the management still puts pressure on their employees because they do not meet their goals.

Another case of how the market organizes the daily work process was expressed by Herr Roth. Asked for the setup of the typical work day he referred to the customer's influence.

> "Depending on what is demanded from the customer, that's how the daily work day is arranged." (Herr Roth, 35 years old, German Soft Corp)

When I asked Frau Müller how independent her work is and if she can have sole responsibility for her tasks, she answered: "Well, I *must* have the sole responsibility for my work!" This illustrates what was discussed in other studies: How the allegedly gained freedom puts even more pressure on the employees. Sennett also emphasizes the enormous pressure that results when workers take on increasing responsibility. With teamwork, for example, employees keep a high responsibility for their own work and are not discharged from their responsibility. The example of a woman's experience in an advertising agency illustrates this issue. The woman took much responsibility and risk for her new career. However, she was unable to handle the risks that came along with her work and could not handle her duties. One important reason was that the responsibilities were not countervailed by an increase in appreciation by her new employer. Also, the case of the social climber who faces a lot of responsibility in his jobs shows how this situation is accompanied by the fear of losing control over his life. Because the high responsibility he has within his work leads to constantly changing job changes and therefore constant changes in his private life, the responsibility leads to high emotional pressure. Sennett even goes to such lengths as imputing to people like today's social climber a corrosion of character (which is also the title of his book) because of the increasing necessity to react in the short term and loosening of long-term relationships (Sennett 1998).

The influence of the market also leads to a reduction of creative potential in what were originally creative jobs. When I asked Frau Schmidt if she would judge her work as being rather creative or rather routine work she had a clear answer. In her view, software developing is always a creative work. She indicated that the creativity was

even higher earlier, when employees could bring in their own ideas more instead of working under enormous time pressure and focusing more directly on a current project for a customer. But still, the work they perform is creative work. Her management tasks, in contrast, she defined as highly routine kind of work. But Frau Schmidt said she always needs a new challenge. That is one reason why she thinks that her time in her current position is limited. Because of the relatively flat hierarchies it is difficult to move up, so she does not know what comes next.

An intense workload, which is caused by the influence of the market, among other things, leads to an increase in work-related illnesses. One of the changes observed by an interviewee is that people only stay at home when they have severe and chronic illnesses like tinnitus and chronic back problems. She has noticed that the frequency of these illnesses is increasing. On the other hand, Frau Schmidt told me: “Because of a cold nobody here stays at home.” Because employees work under intense pressure, they come to work with their cold. This subjective observation can be confirmed by statistical data about trends in sick time in Germany. The number of staff away on sick leave has decreased for years and has reached a historical low. In 2004, the total number of staff home sick was below 3 percent. A study by one big German health insurance company confirms that more than two thirds of its members go to work sick. This leads to the increase in early retirements and chronic illnesses that are work-related (Deutscher Gewerkschaftsbund (DGB) 2006).

The market also influences the work time, more specifically, the exposure to overtime.

> “The only reason we keep track of the overtime is because of the costs of the particular project, cost of the particular task. We are not paid overtime.” (Tom, 53 years old, US Trad Corp)

Starting out at the beginning of his career with a self-concept of an ever-flexible employee who has to move on constantly, Herr Meier has reached a point (at 40 years of age) where he seeks more security, also economic security, and stability. Therefore he decided to start working for a large company to receive some more stability. But he admits that the extremely flexible and open way in which he had organized his work life before was limited to a specific time and age period. As he gets older he strives for a quieter work environment. Because German Soft Corp has enough assignments, he feels there is more security now. But later during the interview he admitted that planning the future is still difficult. He cannot plan anything for five weeks ahead.

> "Overnight there could be a next big project, the chance exists, but it does not have to happen." (Herr Meier, 40 years old, German Soft Corp).

Herr Roth talks about the mentality within his work environment:

> "I cannot resist changes; therefore I have to have the ability to make the best out of changes. I see changes as new chances that I have not had before. … Because I have engaged in rearrangements it was possible for me to have professional advancement." (Herr Roth, 35 years old, German Soft Corp).

Finally, Herr Lang doubts if personnel management really means moving up the ladder in his company. Moving to a higher level in the hierarchy includes increasing pressure from the top management, which in turn depends on external forces. Also, moving up the ladder means not getting in touch with project tasks like planning and controlling.

These cases about the direct impact of market forces on employees demonstrate how this dimension changes work processes.

5.4 Finding: Complexity Necessitates Flexibility

Using three different topics I presented examples about current developments in the work process. All of these topics convey the high level of complexity in contemporary work. As shown for several cases, this complexity necessitates flexibility within the work process.

The field of learning, for example, provides a number of examples where processes are very complex, thereby showing the importance of a particularly high level of flexibility. The role of capital and labor within the education and subsequent career of IT workers is not as clear as it used to be for traditional occupations. The interaction of capital and labor can therefore be described as somewhat more flexible. Moreover, there is an indispensable need for interplay of theoretical and practical education and knowledge.[93] Along comes a high variety of training opportunities for IT related employees, such as institutionalized, project-oriented, and private training. The flexibility in this context is based on a reduction of institutionalized training in favor of private training needs. Because of the high pace of innovations in the IT field, flexible learning is inevitable. The example of Silicon Valley provides an idea of how learning in collectives within networks best matches with today's economic situation. The lack

[93] One may argue that this has always been the case. The evidence shows, however, that the workers today are much more aware of this topic than in the past. Decades ago, the importance of a good interaction between theoretical and practical knowledge was rather implicit and not widely discussed. It is likely that the modern ICT has forwarded the rethinking in this area.

of formalizing their professionalism cognizant encompassed by ICT workers and the enormous change in skill requirements greatly challenge on employees' as well as employers' flexibility. Even though, the workers are aware of the fact that employers depend on their personal knowledge, they realize that employers try to stay flexible by demonstrating that they do not rely on them – that they are replaceable.

Complex communication processes in the workplace lead to highly flexible work organizations and work arrangements of everyday tasks. This might have been a characteristic of work processes in the past, but the interviews show how conscious the software developers are of these procedures. As a result, they find flexible ways to handle the differences between informal and formal communication or impersonal and personal communication. Even though at first glance ICT could be seen simply as a tool that accompanies the current restructuring of work processes, the statements of my interview partners made clear how they are aware of the fact that ICT, especially the network technologies and the Internet, shape their everyday work.

The market was the last dimension taken into account regarding the restructuring of today's work processes. The market's direct influence on everyday work activities causes high complexity which in turn leads to high flexibility of activities. The results from the qualitative interviews confirm that workers are very aware of this aspect of their changing work surroundings. The awareness of employees concerning the increasing influence of the market on their personal work situation could be an advantage for future developments. They may start being able to react to changes better if they are able to read the economic influences on their job. The current analyses warn that this may not be the case yet, however. Sennett (1998) describes how workers are illegible concerning the profoundness of their tasks. Voß and Pongranz (1998) identify chances and risks for a new type of worker, the employee-entrepreneur. Gerlmaier (2002) points out the problems that come along with the increasingly flexible self-orientation of freelancers and entrepreneurs due to the direct influence of the market.

Overall, the chapter gives initial ideas about current developments concerning the dimension of work. The conclusion that the dimension of work is becoming more complex and therefore necessitates increasing flexibility should, nevertheless, withstand further empirical research.

6 Employment

> "If you are a little bit flexible here, then you receive all conveniences. It is a give and receive. And this is fun and this is nice!" (Herr Pfeiffer, 32 years old, German Soft Corp)

Employment became more and more flexible during the last decades. Innumerable social science studies address this topic presenting empirical evidence, explanations, and forecasts related to the topic of flexible employment. The topic is much more prominently discussed than the previously introduced fields of increasing flexibility concerning the dimensions of space and work.[94] Flexibility in these studies refers to changes within the labor processes from an organizational perspective. It is the structural flexibility of employment that is widely discussed in this scientific research.

Focusing on the IT industry and on IT workers, in this chapter I move away from these pure structural aspects of flexibility, toward a pattern of interconnected and pervasive flexibility that is evident within several dimensions of employment. I will show that the flexibility of employment exceeds the structural aspects of flexible employment with developing into being interconnected and permeant.

6.1 Employment Relations

The underlying thesis of this chapter is that objective employment relations are becoming more flexible, and that the handling of employees concerning their flexible employment situation is characterized by a highly subjective, intrinsic flexibility.

[94] Work was defined in chapter 2 as "the actual nature of the activities people do while engaged in the process of production. It includes the physical and mental processes required, the tools and technology used, and the relations with other people […] that they engage in during the process of performing those activities" (Benner 2002, 23f.).

6.1.1 The Changing Employment Contract

> "Life-time job security within a single firm's internal labor market yielded to organizational requirements for more flexible staffing arrangements to control costs and cope with uncertainties in varying demands for labor. Decreasing job tenure, rising part-time employment, increasing contingent workers, and depleted benefit plans characterized the new employment deal, while psychological commitment and loyalty to the organization eroded." (Knoke 2001, 203)[95]

This is how David Knoke summarizes the newly emerged employment contract. In addition to institutional changes, subjective changes also play an important role for the changing employment contract. Informal networking outside their own company plays a major role for workers in compensating for the high uncertainty they face concerning their employment relationship. Taking the subjective dimensions into account, Knoke also states:

> "The weakened bonds between employers and employees rupture the supportive psychological connections sustained under the traditional employment contract." (Knoke 2001, 178)

David Knoke's view is critical of the high-performance workplace, because he calls attention to problems like peer pressure and intense self-monitoring that accompany teamwork and assignment of a high level of responsibility (Knoke 2001).

Forms of flexible employment like temporary employment and contingent work could be a sign of an increasing orientation toward employment within society. In contrast, they could be the response to the continually bad situation on the labor market. Flexible employment could, thus, be trend toward a new standard employment condition. The statistical information for this kind of employment is not developed enough to really explain the role of these volatile and insecure employment relations (Schmid 2000). There are hints that flexible employment is a trend in latter direction, though, because its existence is due to a lack of acceptable employment contracts (Standing 1999).

[95] As will be shown below (chapter 6.1.2) despite the fact that internal labor markets might not fit into current developments they still exist and coexist with the new labor market arrangements. Even though, Knoke uses the structure of internal labor markets as a starting point to what has changed, he does not address the indeed decreasing but ongoing importance of internal labor markets. Nevertheless, his implications about the changing and new employment contract are valuable.

The indeterminant nature of employment contracts is connected with control problems of the management.[96] According to Altvater and Mahnkopf, the existing labor contract is experiencing a "formal in-formalization." Within existing formal structures where the employment contract is in place, the level of formalization and regulation of labor is decreasing. Characteristics of these variations in in-formalized employment contracts do not acknowledge the norms concerning space and time anymore (Altvater and Mahnkopf 2002, 134ff.).

De-standardization is another element of increasing flexibility within employment relations. A German longitudinal study conducted between 1985 and 2000 by the socio-economic panel (SOEP), identifies a de-standardization only since the middle of the 1990s. In addition, there are indices that de-standardization of employment is not general, but is focused on low-skilled workers in Germany. Therefore the existing social inequalities are reinforced due to the new developments. Another observation of the cited study is the increasing flexibility of the rather inflexible structures of the public service. Workers in small companies face more risk and insecurity than workers in larger companies. Social inequalities associated with jobs and qualification levels have consolidated (Sill 2005, 252).

There is evidence of a connection between flexible labor and the public sector in the United States as well. The public sector has a significant role in reintegrating flexible labor in a way that is socially compatible. This is only possible, though, with an increase in flexibility of the public sector itself (Carnoy 2002, 214). In his study Carnoy emphasizes the need for more flexibility within the public sector and puts forward the argument that the United States would have a big advantage over many other nations if it would encourage so-called knowledge communities as integrative institutions of the future and also encourage public sector flexibility. In addition to encouraging flexibility, a general commitment to public sector engagement in the labor market is important. The engagement by the public sector in the labor market is much more widespread in Germany than in the United States (see also chapter 1.3) (Carnoy 2002, 214).

New media professionals do not view themselves as "employees" (Batt et al. 2001). Rather, they view themselves as project workers whether or not they are permanently employed by a specific employer. Furthermore, full-time does not

[96] These transformation problems of the management were already discussed in the 1980s within the "Labour Process Debate." Important representatives are Braverman (1974) and Burawoy (1982). See also the discussion by Mahnkopf (1987).

necessarily mean long-term employment (which pretty much was the case in the past). The new media professionals interviewed by Batt et al. stayed with their employer for only six months on average.

Decreasing job security is often discussed as one consequence of flexible employment. The survey supports the view about decreasing job security for IT workers. For example, only a little more than half of the respondents were satisfied with their current job security and only two-thirds thought they would have steady employment in the next two years. Moreover, new media workers' career paths do not follow an obvious direction from contingent worker to full-time status. The majority of the oldest and highest-paid professionals are independent contractors or entrepreneurs. This reflects the necessity to respond to rapidly changing markets, which is easier for workers with short-termed contracts and with the status of an independent contractor (Batt et al. 2001).

The above presented results from the Economic Policy Institute study are important because they show various examples of how high flexibility is anticipated by the professionals. The goal is *not* to be employed permanently but rather to work as an independent contractor or as an entrepreneur (Batt et al. 2001). This gives hints about how the increasing flexibility concerning employment contracts over the last decades pervades the employees' situation. The profound flexibility leads to an implicit demand by the employees for flexible employment arrangements. Originally being imposed from the outside, flexibility today seems to be an intrinsic demand made by high potential professionals.

Regarding the employer-employee relationship Batt et al. conclude:

> "Labor flexibility is a two-way street: the ability of employers to use workers on short-term contracts is offset by the workers' absence of loyalty to their employers. Professional identity and the work itself come to take the place of any deep connections with an employer." (Batt et al. 2001, 41).

Two points are important here. One is that despite a high commitment toward their work, IT professionals do not have a high loyalty to or deep connection with their employer. The second is that the basis of a stable relationship is replaced by a flexible handling of their situation by the employees. The flexibility brought in by the market and from the employer side has developed into a flexibility demanded by employees.

Not only in the United States but also in Germany, analyses exist about a high level of employment insecurity among ICT workers. Dostal, a researcher at the German

Institute for Employment Research, explains the short-termed and unstable employment structures as resulting from the rapid changes within the new economy. He predicts that these conditions need to bring about a guaranteed institutional stability. For example, self-employed individuals and entrepreneurs would be in a better position to freely evolve if they would not be afraid of loosing their current socioeconomic status (Dostal 2006).

Reducing the anxiety and fears about economically descending for individuals that plan to start their own business is one goal of the labor market reforms in Germany (see chapter 1). In addition to the already existing so-called "bridging money" (German: "Überbrückungsgeld") for founder of a new business in order to bridge the time between employment and the possibility to earn money by being self-employed, the Federal Employment Office introduced a payment that especially addressed unemployed people with rather low previous income (the so-called "Ich-AG", see also chapter 2). The reforms have not been implemented long enough yet to present valuable information about the effect on, for example, the development of self-employment due to the offered support. Early results show, however, that the support could be valuable to increase the number of successful self-employed individuals. There are some cases of misuse of the financial support as well. Upcoming empirical studies will be able to provide more answers about the percentage of misuse of this kind of support (Bundesregierung 2006).

A solution for the rising insecurity was presented by Keller and Seifert with their "flexicurity concept" (see also chapter 1). The basic principles behind the "flexicurity concept" are the preference for internal forms of flexible employment within a company, the promotion of further education, and the introduction of a basic pension. The advantage of the "flexicurity concept" approach is that it addresses needs for flexibility from the side of the company as well as needs for security of the workers. A recent study by Keller and Seifert about the current situation of atypical employment in Germany suggests again that the development of a growing proportion of atypical employment would accompany a "flexicurity concept" (Keller and Seifert 2006).

In comparing the US and German situations of software developers it is surprising that Knoke speaks of the changing employment "contract." None of the interviewed American software developers had a contract from their company. All

German employees did.[97] This aspect symbolizes the extremely different institutional premises of American and German employees. As a German I was especially interested in how my American interview partners deal with this highly volatile situation. Surprisingly, most of them do not see themselves in a volatile situation. From their perspective they have a secure employment relationship. As an example, Jim expresses this aspect this way:

> "Oh yeah, I feel secure with my employment. I think, it's just trusting the company. And this company is exceptional. The work environment is great. They have a fitness, well-being program, they have trainers, we have movie theater, they are putting in a natatorium out here – so they gonna have a pool for the employees."
>
> "Why to you think your employer does that?"
>
> "We have a real low turnover rate, which really helps the company."
>
> "Why is that important?"
>
> "Because there is a lot of knowledge, probably in the whole company, but I know for our department, if you have someone come in and they work two years, it's good for the company to have more years of experience. As you work here longer with our product, it is pretty big and you have a lot of experience. It's hard to close the gap. It just takes longer if the person is not as experienced. The turnover rate is a big deal. And I think everybody is happy." (Jim, 31 years old, US Stat Corp)

Even though the majority of employees in US Stat Corp do not have an employment contract, the turnover rate is low. The employees are in fact in an insecure employment relationship but they do not feel that aspect of their employment condition.

In contrast, at another company, the interviewed individual with the longest tenure (26 years) within one company still feels himfself in an insecure employment relationship:

> "Can you tell me more about your employment situation?"
>
> "I am just an employee. I can be terminated at will."
>
> "Since 26 years?"
>
> "Yes."
>
> "How do you know that you are not?"
>
> "Well, there are no guarantees. Some people do have an employment contract. I don't. If I would have come in to the company at the level I am at, I would have an employment contract."
>
> "Why can't you get one later?"

[97] Again I would like to emphasize that this statement does not claim to be representative but rather it is illustrative for the different situation in both countries.

> "Never asked. Never been an issue. But even with an employment contract, I mean, if I would have been laid off, I would get a certain amount of pay; I might end up with six months. But there is no guarantee in the employment."
>
> "So you just live with that because it is like the way it is?"
>
> "Well, you think about it when business is not good. You're watching other people losing their job you think about it a lot. If it's the situation that they hire people then you don't think about it." (Tom, 53 years old, US Trad Corp)

Obviously, the corporate culture of US Trad Corp is different. Tom does not feel totally secure in his employment even though he works for the company for more than 25 years.

6.1.2 Internal Labor Markets

The theory about the role of internal labor markets was originally introduced by Doeringer and Piore (1971). In their approach they contradicted the standard economic theory that basically viewed the labor market functions like any other markets – ruled by supply and demand. Thus, economic theory only brought attention to external labor markets. The internal labor markets approach introduced the perspective that not only economic, but a mix of social, political, and economical factors influence the labor market and that an internal labor market within organizations exists. Doeringer and Piore concentrate their early analysis on the explanation of internal labor markets for blue-collar workers and large companies. The existence of internal labor markets was found for white-collar workers as well (Osterman and Burton 2005). The problem of focusing on large companies is that most firms in the United States are small, with less than 100 employees.[98] Currently the continual existence of internal labor markets is questioned because a shift of power relation in work organization is assumed with the restructuring of the economy. Because the role of the market is viewed as being more and more important, social and political aspects of work organization seem to take a back seat.

In his historical overview of the development of internal labor markets in Germany, Schmiede emphasizes the indeterminacy of employment conditions as the main reason for the evolution of internal labor markets. He finds evidence of internal labor markets since the beginning of the 20th century. According to Schmiede modern production conditions are responsible for the emergence of internal labor market

[98] In 1997, 97.6 percent of companies had less than 100 employees. These companies represent more than half (54.6 percent) of all US jobs (Knoke 2001, 84).

structures. He also argues that an increasing internalization of the labor market does not contradict higher external labor market risks within the company and on these internal employment conditions (Schmiede 1997). Therefore, Schmiede's analysis suggests that internal labor markets should still play a role today, despite the importance of external market forces.

In their current analysis of US internal labor markets Osterman and Burton ask about the relevance of the internal labor market perspective "in a world where long-term employment in bureaucratic organizations is less common, academic disciplinary boundaries have become more rigid, and the subjects of scholarly inquiry are increasingly distant from the world of practice" (Osterman and Burton 2005, 427). In their view the internal labor market approach is still important, because they see a role for social and political factors within labor market arrangements, given that organizations still do not immediately adapt to economic changes. They ask, thus, whether the idea of internal labor markets "is still useful, either as a description of reality or as a theoretical way of understanding the employment relationship" (Osterman and Burton 2005, 431). Specifically they want to know whether stable careers still exist within organizations, how rules concerning employment have changed and if social forces still play a role despite the increasing influence of the market forces.

Concerning careers and governing of employment, Osterman and Burton find internally contradictory evidence. Although they found relatively high job tenure (see chapter 3), they argue that the role of careers within a company is viewed differently by workers:

> "Imagine that one hundred people worked together steadily for a number of years with no untoward events. One day someone walks in and summarily fires one person and then walks out. It is true, as the statistician would argue, that only 1 percent of the group has lost their job. However, the world has been turned upside down for everyone. The remaining ninety-nine employees will come to work everyday wondering when their turn will come. This worry will inevitably alter a wide range of behaviors. The actual changes … are more extensive than one in one hundred and it is reasonable to believe that their consequences have reverberated broadly" (Osterman and Burton 2005, 433).

Even though the growth rate for temporary and contract work are relatively high, Osterman and Burton point to the relatively small number of these employment situations and therefore a relatively small influence on the meaning of internal labor markets (Osterman and Burton 2005, 435).

Osterman and Burton find an increasing influence of market forces on wages. However, wages are not completely set via the supply and demand rules. They therefore

conclude a weakened role of internal labor markets compared to that of the past but that internal labor markets are still important for wage setting (Osterman and Burton 2005, 437).

A German study supports Ostermann and Burton's findings. The study was limited to the "Rhein-Main" metropolitan area. The researchers asked about the direct influences of an application of ICT, network technologies, on the internal and external labor markets of companies (Caspar et al. 2001). The results of this study are in line with the other studies mentioned above. In the "Rhein-Main" area, internal labor markets still play an important role. There are hints, however, that those firms that do not use internal network structures are more likely to use external labor markets. An increasing polarization of low-educated and highly skilled workers is likely because more highly educated employees work in more networked companies. Instead of a general increasing influence of the market on employment relations and a general cutback of internal labor market structures, the authors found an increasing heterogeneity of employment relations due to the usage of ICT. Decentralized information and communication networked companies more often use "functional" respectively "internal" labor market structures (Caspar et al. 2001).

In sum, the introduced studies suggest the continuing importance of internal labor markets in German as well as in US companies despite other and more popular indications.[99] Notwithstanding an undoubtedly higher influence of markets forces on traditional labor market arrangements, other factors determining the employment conditions will continue to play an important role. In terms of flexibility this development can be interpreted as flexibility between the external and internal labor market. That is to say, labor market flexibility does not exist or increase due to the disapperance of the (putatively inflexible) internal labor markets and due to the dominant role of the external labor market, which is seen as much more flexible. The flexibility of the labor market can today still be described also with an interchange between internal and external labor market.

6.1.3 Labor Representation

A comprehensive empirical study about workers' participation in the information and communication industry in Germany was conducted by Boes and

[99] Because the application of new ICT reduces transaction costs for external labor markets, a common thesis is that external labor markets are becoming more important.

Baukrowitz at the turn of the century (Boes and Baukrowitz 2002). Recapitulating, the researchers do not find empirical proof of a general erosion of workers' participation, as currently is a widespread thesis among management, union representatives, employees, and social scientists. Rather, their study suggests that workers' participation is being renewed and maintained.

Boes and Baukrowitz identify three basic company structures where labor relations and workers' participation develop along specific patterns. In the traditional, formerly Fordist companies, they find ongoing mechanisms for workers' participation such as collective bargaining and the existence of works' councils. Even though these large companies are all participating in the global market and have international company structures, the mechanisms created in Germany are still in use. The companies actually draw on collective bargaining and works' councils as institutionalized practices when reorganizing their organizations. The changes that take place, therefore, build on these traditional mechanisms and have new characteristics (see below). In these formerly Fordist companies this is specifically true for the changes within the collective bargaining system (Boes and Baukrowitz 2002, 223ff.).

Start-up companies do not have and therefore do not build on traditional labor processes and participation structures such as collective bargaining and works' councils. In these companies the owner makes most of the relevant decisions. But the owner is usually also involved in the project work, and a high level of exchange between owner and employees takes place. This company type is therefore characterized by an intensive level of workers' participation. The authors caution that this "communitarian culture" is dependent on the relative small size of the company and on the success of the company. As can be seen in the third identified company structure, the "Dress shoes-and-Sneakers companies,"[100] this relatively open and unregulated way of participation does not work very well when companies get into economic difficulties or start growing (Boes and Baukrowitz 2002, 235ff.).

The results for the "Dress Shoes-and-Sneakers companies" are not as clear as for the above described company groups. This is probably because of the different background and settings of these companies, some having developed out of start-up

[100] In Germany, start-up companies are famous for a relatively casual corporate culture on the organizational level (flat hierarchies, project-oriented work, teamwork, etc.) but also in terms of employee dress. In traditional German companies a dress code is much more common, and, for example, sneakers are usually not worn on the work site by white-collar workers. The position of a company that is between traditional and start up companies is therefore symbolically expressed by this term, indicating it straddles the two worlds – one of dress shoes and on of sneakers.

companies without traditional background and some being integrated into traditional industry structures. It seems like collective bargaining and works' councils are not integrated enough in some of these companies, which has led to a highly conflicting coexistence of contrary interests. However, in some companies mechanisms of workers participation such as works' councils have started to be accepted and are increasingly being integrated as partners in the labor process. In these companies bargaining structures seem to be used more and more in order to stabilize companies' interests (Boes and Baukrowitz 2002, 258).

The case of SAP seems to fit into latter company structure, the category of "Dress-Shoes-and-Sneakers companies." At SAP, bargaining structures are still not viewed as valuable. SAP is the only company in Germany with more than 1,000 employees without a works' council.[101] In 2006 three SAP employees invited employees to a works meeting (a meeting that can initiate works' council elections). The vast majority of those who attended the works meeting voted against the implementation of a works' council. Only a few more than 500 employees of the 5,632 attendees voted in favor of a works' council. The three initiators went to court and insisted on their right to be represented by a works' council, which is mandatory by law in Germany (Beise 2006). Acting upon the advice of their lawyers the SAP management gave in and agreed to works' councils without a court ruling. In June the elections for the first works' council at SAP took place. On the slate of individuals competing were not only union representatives but also employee representatives from the supervisory board (Goldschmitt 2006). As expected, the parties with a rather skeptical attitude toward a works' council in their company won the majority of votes. Among them were five out of the eight employee representatives from the supervisory board. SAP had been the last out of the 30 Dax companies without a legally mandated works' council (Süddeutsche Zeitung 2006b, Frankfurter Rundschau 2006).

The recent role of unions in the software industry can also be illustrated with my case study examples. German Dev Corp would also belong to the group of "Dress Shoes-and-Sneakers companies." But there a works' council has existed since about 10

[101] The number of works' councils has declined for many years. At present, only about 40 percent of all German employees are represented by a workers' council. Small- and medium sized-businesses especially do not necessarily have a workers' council anymore. At the end of the 1990s, 78 percent of all employees' working in firms with five to 100 employees were not represented by a workers' council. The number of IT companies without a worker's council is disproportionately low. With the exception of SAP, however, large companies with above 1000 employees have works' councils (Süddeutsche Zeitung 2006a).

years. As judged by my interview partner, who used to be associate shop chairman, the employees' view toward the implemented works' council is positive. However, some of the high-performance employees say that they do not need a works' council because they can represent themselves. Their opinion corresponds to the negative view toward works' council at SAP. Nevertheless, Frau Müller explained that the role of the works' council has changed since it was first implemented in the company. During the early years and during the time when she was the associate shop chairwoman, she said there was very good cooperation between the works' council and management. But this relationship has changed. There has been turnover in the human resource department and the board of directors has changed. The atmosphere is no longer characterized by cooperation.

One major result shown by Boes and Baukrowitz, what they call "action along interests" (German: "Interessenhandeln") of employees, is currently the largest challenge for labor relations in the German ICT industry. Action along interest refers to the possibility for workers to follow their interests while performing their job. A subsequent study followed up on this result and concentrated on the level of employees to find out about their exposure to the new development related to workers' participation. In sum, they found that individual "action along interests" and collective protections of interests increasingly agree with each other (Boes and Trinks 2006).

In a recent study within the German ICT industry Boes et. al. (2006) question the current exposure to representation. Interestingly, they found a "new culture of solidarity" within the group of software developers and IT services providers. The reasons for this emergence of a new culture are several possibilities that are offered to individuals to experience community, but particularly the "potential of primary power" and the resulting self-confidence of employees. Despite the common view that high-qualified employees do not seem to need representation because they are able to represent themselves, it is becoming obvious in the study that these employees have learned how representation is necessary for self-determination in order to survive crises. These findings about employees in the areas software development and IT services cannot necessarily be transferred to other fields of the IT industry. For example, the study of the industry of audiovisual media reached contrary results. There employees experience a "new economy of insecurity." That is associated with the increasing autonomy of employees. There, the results about the "new culture of solidarity" found

in the software programming field and IT services field cannot be found (yet) (Boes et al. 2006).

In the United States, the new role of labor market intermediaries has caught the attention of social science researchers. Especially intermediaries that are new occupational communities and that represent workers interests are significant regarding the changes in labor representation. Initially, Benner examined the role of labor market intermediaries in Silicon Valley. In his comprehensive empirical study he identified three different kinds of labor market intermediaries: private-sector intermediaries, membership-based intermediaries, and public intermediaries. An important function of intermediaries for the labor market is reducing transaction costs. This is the most prominent argument for the need and important role of intermediaries. Intermediaries also determine wage levels in the labor market and form power structures. An additional positive function of labor market intermediaries is that they compensate for risks of the flexible market and build and strengthen network relations. Among the membership-based intermediaries are unions. In comparison to other intermediaries, one of the important roles of unions or guilds is the reduction of social inequality. Unions and guilds take more responsibility in this regard than private or public intermediaries (Benner 2002, 2003). Benner differentiates between traditional industrial unions and guilds. The former have declined and represent less than 10 percent of the private-sector workforce in the United States. Surprisingly, though, he identifies a rise in "occupational communities," which can be characterized as being like the preindustrial guilds. These communities of individuals with similar skills, social bonds, and labor market experience provide the opportunity to share knowledge, build contacts, and protect their members against the insecurity and volatility of the labor market. In observing these changes, Benner even talks about a "new unionism." Three general functions of these member-based occupational communities can be identified. One important role is to improve their members' opportunities to find a job in the regional labor market. Another aspect is the involvement in skill-improving activities for their members. A third function is improving the negotiating position of their members in the labor market. Despite the fact that the power and influence of these new forms of guilds is still relatively weak, their approaches reflect current needs in the flexible labor market of information capitalism (Benner 2003).

The general impression of the crisis of a labor movement even internationally was questioned by Silver. According to her study the labor movement from an international perspective is not necessarily in a general crisis (Silver 2003). Diagnosing the labor movement as being in crisis only applies to wealthy countries. Historical background of labor movements is helpful to be able to compare contemporary and previous developments. Usually, a crisis in labor movements is explained by the hypermobility of productive capital, sometimes emphasizing direct, sometimes indirect impact. In addition, reorganization in production and labor processes is given as evidence that the labor movement is in a crisis (Silver 2003). In her study Silver investigated for the impact of contemporary globalization on workers' bargaining power. Her general question was "[w]hether and to what degree marketplace, workplace and associational bargaining power have been undermined by post-Fordist transformations in the organization of production" (Silver 2003, 15). Silver took approaches from Karl Marx and Karl Polanyi into account, the former suggesting a gradual movement toward increasing labor unrest corresponded with a fundamental and ongoing transformation of production, the latter suggesting a pendulum movement. Thus, she differentiated between Marx-type and Polanyi-type labor unrest. She showed contradictory tendencies within historical capitalism – the crisis of profitability and the crisis of legitimacy. As a further theoretical premise, Silver emphasized the existence of boundary-drawing strategies, which are in general not included in traditional labor studies following Marx. There are three forms of boundary-drawing strategies: segmenting labor markets, bounding citizenship, and constructing exclusionary class identities on nonclass bases. In her opinion, in historical capitalism system-level problems do exist, which influence boundary drawings. All in all, Silver's findings about the connections between labor movements in different ages, different countries, and different industries, describing them as cycles, give important insights into the development of labor movements.

Several theories describe diverse reactions of capitalism to labor unrest. Silver distinguished between spatial, technological/organizational, product, political, and financial fixes and presents historical material as evidence of the existence of the different fixes that prevented or cured labor unrest in the past. Concerning the technological/organizational fix she described only the example of the assembly line from Henry Ford. But more attention should have been given to this fix by including current technological/organizational developments as well. Silver identified "high-

waves" of labor unrest but did not connect them to the development of the labor movement in a particular industry. Such a connection would also be important for further explanation of the replacing of fixes (Silver 2003). A study by the American Management Association shows that 31 percent of all companies are engaged in hiring and firing at the same time. The average period of time an employee is laid off grew by 6 percent (Cappelli 2001). According to Osterman these data give evidence of an increasing level of turnover, which he considers as a sign of a greater need for intermediaries (Osterman 2004). The in chapter 3 of this study presented data about the decrease in high-tenure employment also shows how

> "Firms must rely more heavily than in the past on the external labor market to supply labor, and this also has important consequences for the role of labor market intermediaries" (Osterman 2004, 160).

In his study Osterman concentrates on the emergence of private-sector intermediaries which emerged mainly because of highly volatile labor markets. Among the private-sector intermediaries he mentions staffing and temporary help firms and the Internet. Unfortunately, he does not include Benner's broad analysis about intermediaries (Benner 2002) to support his arguments for opportunities for public policy, even though he reaches fairly similar conclusions. Osterman criticizes that the public policy has been undermined by the growth in private-sector intermediaries, many of which have taken the place of appropriate institutions. In his view the private sector has responded to this problem by creating new institutions. Nonetheless he pleads for "creative public policy," emphasizing the necessity for training. In sum, suggestions from both Osterman and Benner for public policy initiatives to ameliorate of labor market conditions are a higher involvement and support in mediation, education, and training. In addition, social security problems and collective action problems should be handled more intensively by public policy (Osterman 2004, Benner 2002).

There are significant upheavals in both internal organizational representation structures and external labor movement developments. On the basis of empirical evidence about the ICT industry, there is no consistent picture of these trends in the labor movement. Also, the closer look at the ICT industry suggests that there is high flexibility within labor representation, unions, and aspects of the labor movement. The unions themselves are slowly becoming more flexible in handling the current situation, and the labor environment offers other alternative measures of support that are flexible. Thus, the superficiality of flexibility is slowly penetrating unions and other modes of labor representation.

6.2 Institutional Aspects of Qualification

In chapter 5 I discussed how individuals' skills and qualifications affect their work tasks and work performance. Individuals' qualifications also affect institutions, a topic I will discuss in this section.

Institutional education and training for IT workers has a specific set of problems compared to traditional fields of work. The German situation was worked up by Boes et. al. (1995) who found fundamental problems regarding education and training of IT professionals. In general, they emphasized that not only do the number of IT professionals and jobs need to be increased, but also there needs to be a drastic change in the concept of education and training. They introduced new principles for education and training in the IT field arguing that the current approach to training in key qualifications does not address the specific needs of IT occupations. Other key qualifications are more and more important in IT and other occupations. IT workers need to expand what the authors call their "reflexive professionalism." This concept addresses the need to handle tasks from a subjective level, with each worker actively taking part in performing the tasks. Workers need to actively build a valuable base of their professional and technical knowledge. They need to determine what kind of professional and technical knowledge is really necessary for their concrete work task. Usually, workers have specifically defined work tasks that correspond to specific qualifications. In IT, workers have to constantly redefine their knowledge according to the specific problem that occurs. For this, a reflexive approach is necessary. With that approach the actual nature of people's activities during the work process would be woven into the institutional apprenticeship and training system in Germany. This would be a positive step because of the increasing importance and changes of people's work process, as discussed in chapter 5. Based on the principle of "reflexive professionalism" the authors plead for a "holistic labor structuring competence" (Boes et al. 1995). Most important for this approach is its openness to constant readjustment to new requirements. Unfortunately, the pace of technological development and the issue of institutional assimilation to that development of technology still do not fit well together in Germany. There have been some attempts in adjusting the apprenticeship and training system by creating new jobs within the apprenticeship system and developing modern training programs for IT-related occupations. Numerous problems still remain concerning institutionalized qualification for IT-related occupations. Trained personnel

often do not find an appropriate occupation. The subject matter taught in the new job programs still lags behind modern technology. Also, there is no established system to acknowledge skills that have been gained by learning-by-doing on the job.[102]

Bernstein from the Economic Policy Institute argues that the current employment problem in the United States does not result from the lack of skills but is a purely demand-sided problem. To support his argument he compared the employment rates of young graduates between ages 25 and 35 to all graduates older than 25 years. Since 1979 the employment rates have fallen in both groups. The greatest decline took place since 2001. This demonstrates that the demand for highly educated workers has fallen in general. Evidence that goes in the same direction compares employment rates of young graduates at the time of an economic peak and three years later. This comparison shows a considerably weaker labor demand in the recent period (2000 compared to 2003) than in other periods (1979 / 1982; 1989 / 1992). The lack of job creation in the field of IT is also striking. The net job losses in the Internet and telecommunication industry were at 20.2 percent between March 2001 and February 2004. Bernstein concludes: “The data strongly contradicts a skill supply-constraint interpretation” (Bernstein 2004, 5).

At the beginning of this decade researchers in Germany found proof of a serious lack of qualified IT workers. The research about the need for these professionals stimulated public discussion about introducing green cards for highly qualified IT professionals. Due to the high rate of unemployment, then-German chancellor Gerhard Schröder opposed this suggestion. Welsch (2001a) found proof of a severe lack of qualified IT workers in Germany in the empirical data from the Institute of Employment Research (IAB) and the German Association for Information Technology, Telecommunication and New Media (BITKOM). However, he pointed out that a lack of qualified workers in the middle level of employment can be counteracted within only a few years with some effort. Among such efforts is the improvement of the apprenticeship system for new kinds of IT jobs, which was already advanced in the beginning of the century. Another possibility Welsch sees for preventing and

[102] For example, the project ProIT (www.proit-professionals.de) is trying to bring together knowledge through experience and knowledge through the apprenticeship system. The project is trying to put both career paths on the same level. That way informally educated individuals would be able to receive credits for the knowledge they have gained.

overcoming the lack of middle-educated IT workers is vocational retraining for these jobs. A bigger problem is seen in the lack of highly qualified IT professions with an academic background. Here, Welsch favors the idea of a green card, because that gap in professionals cannot easily be closed very fast (Welsch 2001a, 2001b).

A different study, which was presented by the Centre for European Economic Research (ZEW) (2001), also found a general severe lack of qualified professionals in the ICT field. For example, as much as 47 percent of open information and communication jobs were not filled in the first half of 2000. Of these, 80 percent were newly created positions. Therefore, the high number of unfilled positions was not the result of high fluctuation in the field. The study also found the deficiency of IT professionals to be inversely correlated to the size of the company; the smaller the company, the more problematic was the lack of professionals. Most of the unfilled positions (about 80 percent) were those for university or university of applied science degrees (Zentrum für Europäische Wirtschaftsforschung GmbH 2001).

In sum, the lack of qualified professionals as well as the situation in smaller companies needs to be followed up specifically when trying to improve the situation of a lack of IT professionals.[103]

Overall, the role of formal education in the information and communication occupations is growing again. During the 1990s it was the area where career changers had the best chances. If individuals brought the skills and knowledge that they would need for the job it was pretty irrelevant if they had a certificate and what that certificate said. Today, because the job market tightens in the industry and because there are more specifically educated people, a formal education provides job opportunities and possibilities. One statement of one of my interview partners illustrates this aspect fairly well.

> "I have a friend now, who is my age and is back in school, because she got laid off four times, and she was like: 'I am tired of being the only one in the technical field without a degree. And I know that that's why they choose me to lay me off.' So she is getting her degree just to get some job security. But she is only getting her bachelors at this point. She did not have a bachelor." (Susan, 44 years old, US Trad Corp)

[103] Unfortunately, both studies refer to data from before or in 2000. Due to the developments within the industry it is likely that this situation has somewhat changed. Regrettably, I was unable to find similar studies with more recent data.

Regarding the question of institutional aspects of qualifications it became clear, that the lack of skills cannot be used as a reason for increasing outsourcing activities. The lack of IT professionals concerns the highly educated group and is more problematic the smaller a company is. There is no general lack of professionals. However, there are fundamental problems regarding the education of IT workers. A "reflexive professionalism" is necessary to correspond to current needs.

6.3 Management Practices

6.3.1 Role of Subjectivity for Management Practices

Managing workers is a central component of the employment relationship. It faces particular challenges in an environment in which employment changes rapidly. Especially because work requires significant investment in effort and attention by workers themselves management practices are a central aspect of the employment dimension.

For several years there has been a big discussion about an increase in subjectivity within the work process (Moldaschl and Voss 2002, Kratzer 2003, Krömmelbein 2004). The fundamental idea behind this approach within the sociology of work community in Germany is an increasing need for subjectivity – employees bringing personal judgements to bear their work. Along with these studies comes the work of Voß and Pongratz who promote the development of the "workforce entrepreneur" (German: Arbeitskraftunternehmer) (Voß and Pongratz 1998, Pongratz and Voß 2000, 2003). With "workforce entrepreneur" they refer to workers acting as entrepreneurs while still being employed. The direct influence of the markets which leads to higher needs for reflexivity for the employees is one of the explanations of this new phenomenon. A good overview of the existing approaches and current discussions is given by Holtgrewe (2003) who adds her own perspective.

In the beginning of the 1990s companies promoted an increasing use of subjectivity by their employees because the changing work process made this kind of change necessary. In the middle of the 1990s researchers discovered that it was not just the company making an increasing amount of subjectivity necessary, but that also the market played a leading role in putting pressure directly on individuals within the companies. On the basis of further qualitative studies in the leading European communication company Telekom and in call centers, Holtgrewe argues that it is not the companies or the markets that give the opportunity to use more subjectivity within

the market, but rather the employees themselves need to fight for a rising use of subjectivity within their area of action and experience. Due to increasing organizational flexibility as well as the increasing importance of markets, employees face higher and different demands from their employers. They themselves need to organize their work more often, because the organization does not necessarily provide rules, resources, and norms anymore. Therefore, they need to fall back on their personal know-how, their knowledge and their norms. Because of these increasing demands on their personal engagements in the job the workers should expect a decrease in control by the management. However, there are changing possibilities for how control will be done. Slogans like "control through autonomy" (Sauer and Döhl 1994) imply that control has decreased. Instead of direct possibility of control, Holtgrewe describes it as control over expectation, through evaluation criteria and through influence and hegemony (Holtgrewe 2003).

Holtgrewe (2001) also points to the necessity to expand the theoretical approach that explains the increasing influence of IT on the labor process through requests on subjectivity and communication with an organizational perspective. She emphasizes how organizational dilemmas are passed on from the organization to the employees. This management practice influences current employee-employer relationships. Call centers are a good example to show this development. Call center workers constantly act directly at the border of their organization and its environment, because they shape the relationship of their company with its environment. Doing so, they constantly move between standardization and flexibility, routines and spontaneous improvisation, contextualization and de-contextualization (Holtgrewe 2001). All of this is coupled with a high amount of information processing and interaction with ICT. Characteristic of this employment is management control that is hierarchical, technical, and direct. But also there are so-called "soft factors" of control, namely the employees have control over themselves because their work is only possible when they put enough effort into their tasks. For example, they need to understand and interpret the customer's needs and put a high amount of communication effort as well as empathy and friendliness in their work. Otherwise they would not be able to perform their work at all. This is what Holtgrewe describes as the "soft factors" of control. Holtgrewe summarizes this kind of management practice that leads to a high amount of responsibility of the workers as follows: The employees know more than they know, they regulate more than they are supposed to and they take more responsibility for their environment than they are

actually able to (Holtgrewe 2001, 61). The specific requirements of call center jobs demand that appropriate employees be recruited. They need to be able to subjectively and individually handle this situation. They need to be educated enough to evaluate the underlying problems they are presented with and they must be able to use their intellect for solving the occurring difficulties. Reflexivity of their work, that is constantly questioning the actions of the work process, for example, is an important ability they need to apply. In addition, the manager's ability to exert control is important to solve the dilemmas their employees face (Holtgrewe 2001).[104]

Especially in jobs with a high amount of information processing, the subjectivity of workers is greatly involved in the working process. This needs to be taken into account by managers in order to obtain the best results from their employees. Subjectivity in the work process reflects an increased flexibility within the individual.

6.3.2 "The blistering customers"

Regarding the relationship of software developers with their customers there have been changes over the last decades. As my interview partner George confirms:

> "It [his relationship with the customers] changed in what they want. Also, in earlier times they talked to software developers directly."
>
> "Why has this changed?"
>
> "It's the organizational situation. It's a matter of not having an organizational structure that serves the customers in the appropriate place." (George, 82 years old, US Stat Corp)

This statement gives hints towards a *more* formalized structure in the occupational environment of software developers, which contradicts current explanations of organizations moving toward more flexible and open structures within companies. Another statement from George confirms this conclusion even more directly:

> "The organizations are structured in a more formal manner now. Instead of having people perform assignments in different aspects of the company now it is more structured. People are assigned specifically to certain tasks: sales, marketing etc. In the past, one person might have worked in all of these areas." (George, 82 years old, US Stat Corp)

This statement indicates that organizational structures have become *less* flexible. Clearly, this statement does not refute the entire theoretical organizational literature of

[104] In another article Holgrewe, together with Voswinkel focuses on the impact of the intensified consumer orientation of the workers, which accompanies the effect of subjectivity of the workers. This results from controversial demands from management and customers (Holtgrewe and Voswinkel 2000).

the past decades. But it hints at how the reality of the single worker often differs from the description of phenomenon from the outside. The personal view that structures are moving towards less flexibility and more formalization is a pretty good example of how the macro view does not always capture the interior change of work.

Frau Schmidt mentions a further consequence of the customer's direct influence on employees. As a team leader she is responsible for planning and organizing the upcoming projects. Today, she says, it is harder to be responsive to the wishes of the individual employees. One reason for this is the staff reduction. Handling the same workload with fewer staff makes it is less possible to consider individual preferences. Also, it is harder for the employees to follow their own ideas. Today the focus is on finishing specific tasks for the customer in the current project. If someone's own idea does not fit in, there is no spare time to follow up on it. Customers' needs become more important than innovation for the work process.

Herr Roth from German Soft Corp told me that it is really important for him to know his customers personally, so he meets them once in a while to build up a good relationship. That way, when he works remotely on the project there is better cooperation. But he also said that the management does not seem to understand this issue in his company. Managers prefer to save traveling costs and do not see the necessity to meet with customers personally on a regular basis.

Because customers can always reach Herr Lang, he says that this is a great advantage for his relationship with them. The customers appreciate the fact that he is always reachable. Everybody has to decide whether he or she provides this service to his or her customer, but if one does this is a real advantage, Herr Lang says.

Communication with customers will change tremendously in the future. There are indications that communication will be based more and more on technology, a topic that is often discussed in the software development field. Jim from US Stat Corp explains:

> "Currently, at our company we are looking at that; like Microsoft: They have become very transparent. People are blogging about new versions of Windows showing screenshots and a tremendous amount of details about it. They are blogging not only good stuff, but bad stuff, too. And they are actually saying: 'Well this part, we messed this up and we know we need to fix this and what do you guys think?' They are using it as a way to get customer feedback. If they post stuff up there like that, they get tremendous feedback like that. If they post something that people really hate, they know it much earlier than if they would actually release the product.

> We call them blistering customers. We figure out what the key points of the customers are and we go to sites and we interview customers. So we actually go out and do that kind of stuff. That's more of an intensive kind of work. We have to put a lot of resources into it and where we are different with Microsoft right know is … their audience will read this kind of stuff. Our users are not quite there yet. They do not read the blogs YET, but they will in the future. People like the idea that I do not have to go to that website anymore. I think it will work. But our customers are not there yet; so it is more face-to-face communication at the moment." (Jim, 31 years, US Stat Corp)

6.3.3 Reorganization

A company's investing in ICT is often associated with an increase in productivity. However, investments in ICT often are accompanied by reorganization processes. The relationship of higher productivity and investment in ICT is therefore questioned. For example, Bertschek and Kaiser from the Centre for European Economic Research studied the impact of reorganization processes and investments in ICT on the productivity of the workers. They showed how the investing in ICT is associated with reorganizational processes. They examined 411 companies, looking particularly at the introduction of teamwork and implementation of flat hierarchies. They found increased working productivity in companies that reorganized their work processes when implementing new ICT (Bertschek and Kaiser 2002).

"Knowledge management" has been recently discussed as an important reorganization aspect of modern management practices. Many discussions and implementations of knowledge management tend to overemphasize its technological aspect. More important, however, is the human resource and organizational development that comes along with knowledge management (Roth 2003). Roth describes knowledge management as the enhancement of the concept of "learning organizations." Important for knowledge management is the role of networks (discussed in more detail in chapter 4). Informal networks and communities of practice play a major role in the success of knowledge management. Generally the implementation of knowledge management leads to a totally new combination of operative tasks, learning-by-doing, and communication (Roth 2003).[105]

Knowledge management is a good example of increasing flexibility within management practices because the principle behind it calls for using the available

[105] Recent studies take into account aspects of knowledge management beyond technology. For example, one study discusses the theoretical role of knowledge and knowledge management in companies (Schilcher 2006), and an empirical study by Zarcula (2006) accompanied the implementation of a knowledge management system in one of the German Fraunhofer Institutes.

knowledge rather flexibly and openly within the company. An important innovation of knowledge management is the increasing practice of knowledge sharing. Because knowledge is becoming more and more important as a production factor, the exposure to knowledge sharing between employees and between employees and management is more and more important.

When asked about the nature of the management in his company, George described it as follows:

> "It is not a lot of hands-on management. We have group meetings, usually once a week. And we have teams of computer coders where several people go through a code together, but that's not a very rigid management. It's about individual initiative." (George, 82 years, US Stat Corp)

On the one hand George talks about not a lot of management, on the other hand he talks about not very rigid management. So the management in his company is present among the regular employees, but they direct employees toward individual initiative.

The management of German Dev Corp recently changed. The new management is eager to implement a new corporate culture in the company. Frau Schmidt is rather skeptical about this plan.

> "The establishment of a new corporate culture in this company takes at least one generation." (Frau Schmidt, 40 years old, German Dev Corp)

Frau Schmidt supports her estimation with several factors. There is no hiring at the moment, and the employees have a relatively high tenure within the company. They are used to a different corporate culture that was originally introduced by the founder of the company who valued his employees a lot. The company has been attractive to employees because of the founder's very employee-friendly corporate culture. Frau Schmidt talked about one person who left the company but later came back, explaining that his return was because of German Dev Corp's better corporate climate.

In this software company, which has been in business for several decades the hierarchical structures have become steeper again. Frau Schmidt would like to have flatter hierarchical structures like in the past, because she says that, for example, the distance between a professional department manager and the board of directors is a bureaucratic barrier that leads to delays in decisions.

The same story was told by an interviewee in the American US Stat Corp. This company also started out as a small company over 30 years ago and has grown since then. With its growth, the originally flat hierarchies developed into steeper structures again. I asked Jim if it was hard to adapt to the growth of the company. He stated that is was quite hard for some people. The longer they have been there the harder it was to

adapt to the new organizational structures. For example, the software developing department has five full-time technical project managers today. Only a few years ago it had no technical project manager at all. As Jim explained, the project managers are the ones who monitor the information and who schedule the meetings. They are the ones who keep work on track and make sure it gets done.

My interview partners also talked about the important role of mentors and team leaders in their company. This suggests that the hierarchical formal management structures are replaced by informal, looser structures which are, however, not any less hierarchical. As mentioned before, the way the interviewees talk about the new organization suggests that they do not necessarily experience less bureaucracy and hierarchy, but that flexibility lies in the interaction between bureaucratic management structures and informal communication.

German Soft Corp grew tremendously since its emergence in 1972. Today employees tell me that the management hardly communicates with its employees. Herr Roth told me that he does not really need to communicate with them. As long as everything works out with his customers and the management does not keep him from working, its O.K. to him that he does not see and hear from his managers. The lack of communication between employees and management is an indication of increasing bureaucracy of the organization.

Herr Lang from German Soft Corp talks about the beginning of his work at the company and the consequences of the fusion with other companies and the subsequent growth of the company:

> "Everybody really was very satisfied. It sounds like a paradise, but it really was. No bureaucracy, a lot of freedom: It was really perfect this work. We were not hindered by the organization. … With the merger several corporate cultures and philosophies mixed. All in all, the company developed into being more impersonal and more bureaucratic. Massive power struggles broke out on the high-level management. This did not affect my work directly, but it still did not contribute to a good atmosphere in the company" (Herr Lang, 35 years old, German Soft Corp)

Despite his criticism, he still likes his employer because he has seen different things.

> "In many companies the employees are a resource. They do not get asked anything. The management just gets rid of those they do not need anymore. In my company this is still different." (Herr Lang, 35 years old, German Soft Corp)

Basically, what he is describing is that the new management levels are responsible for handling the formal side of communication. With the growth of a

company the need for professional management develops. These signs of the organizational development of (former) start-up companies introduced in Herr Lang's company add to the perspective of "flexible bureaucracies" discussed by Dose (2006). Rather than the old bureaucratic structures facing new flexible structures as described by Dose, the "old" flexible structures are being confronted with "new" bureaucratic structures.

In a study about organizational principles of what they call adhocracies Mintzberg and McHugh come to a very similar conclusion. Concerning highly flexible network-based organizations in the broadcasting industry they follow:

> "… the only way to maintain the creative and flexible character of the organization was to shake it up periodically … Change for its own sake may become a logical activity in such organizations. Without change, adhocracies die (i.e., become bureaucracies)." (Mintzberg and McHugh 1985).

All in all, this statement about adhocracies is a good example to show that flexible management and organizational structures do not develop or exist independent of the more inflexible bureaucratic structures. My case study examples show that the actual flexibility lies in the productive interaction of both approaches – bureaucratic and flexible organizational structures. Today, bureaucratic and flexible organizational structures both provide valuable specific functions for an organization. A company can be successful when it realizes that it needs the existence of both and that the flexible handling of formalized and in-formalized structures is what advances an organization today.

> "Since the company grew it became more bureaucratic. The office channels are longer and one meets with an obstacle more often than in earlier times. … I have worked here for five years. During that time I had five different bosses, five different structures despite the fact that I still perform the same tasks." (Herr Pfeiffer, 32 years old, German Soft Corp)

The following statement illustrates how American software developers experience layoffs.

> "The company had to do something to reduce expenses. You just get a days notice when you are laid off. You come to work like every day. They tell you that's it. You leave. So there is no employment contract offer here. And I can leave when I want to, whenever I want to. I am not obligated by any contract nor is the employer." (Vivek, 29 years old, US Trad Corp)

The lack of an employment contract and any kind of job security is offset by the possibility of being able to leave the company any time as well. This is only a cold comfort, though, because the employees are usually not in a position to be able to take

advantage of this possibility. Thus, they are constantly, at least unconsciously, in fear of loosing their job.

The nature of management by a team leader with software developing background differs from the management performed by someone with a management degree. Tom, the employee with much longer experience in the company and several years of management background, also insists on the differentiation between leading and managing a group. Leading is associated with support, whereas managing is connected with control.

The fact that specialists take over management tasks shows a further aspect of rising flexibility within management practices. When specialists in another field take over management tasks, they have to extemporize, which automatically means a higher flexibility within their management approaches. Also, the demand for a flat hierarchy and less obvious control leads to flexible acquaintance to how management positions are defined.

An interesting connection exists between experience in the job and development of a position. The more experience software developers gain within their job and the more technological knowledge they have the more they move into the role of having coordinating tasks, basically moving away from technology. There is a relationship between gaining specialized knowledge and growing into management tasks, which has nothing to do with the actual knowledge. This was mentioned by several of my interview partners. Such a development in one's career is also closely connected to the person. A certain personality and professional background are crucial for the perspective needed to assume a role with a high amount of coordinating tasks.

6.4 Gender, Income and Inequality

This section discusses how gender and income are still subject to inequality.

Women still do not play an important role in management positions in Germany. Even though 49 percent of the employees in Germany are female (in 1991 this figure was only 44 percent) their working volume is only 41 percent. In addition, only one out of four leadership positions is occupied by a woman. In large companies this proportion is even lower – one out of 10. Only a quarter of women in management positions, live together with children, but more than 40 percent of the male managers do. Between 2000 and 2004 there was only a small increase in the portion of females in management positions, and there were no increases in full-time management positions and high

leadership. Also, for women between 30 and 49 years of age, there was no increase. The portion of women with children in this group even decreased (Achatz et al. 2006).[106]

I talked to two female team leaders. Frau Schmidt spoke about her role as a female in meetings with her male coworkers on the management level. In these meetings she is usually the only female and always attracts attention. She says that she notices that the male managers like it better among themselves. She also explains that she always feels that she is being tested by those male colleagues in the management who do not know her. If they hear about her good reputation, then she feels they do not initially accept that but challenge it. Therefore, she feels like she has to prove herself over and over. In her view, when men have a good reputation male manager are less critical and accept this reputation.

Concerning specific tasks, Frau Schmidt notices that men indeed work very concentrated and focus on detailed and small fields and also make decisions relatively fast. But she notices that her male coworkers often overlook the context, the big picture behind their little decisions. They do not take this into account enough. In her view, women are more skeptical and factor the context into their decision regarding a small part of the big picture, realizing the possible consequences. The way women make decisions is therefore sometimes a little more complicated but also more anticipatory.

A study by Bertschek and Spitz from the Centre of European Economic Research shows how the introduction of ICT along with organizational change leads to an increase in wages for employees. Based on individual data from 1998/1999 of about 12,000 male employees[107] in Germany, they found an "average treatment effect of IT use of around five to six percent" (Bertschek and Spitz 2003, 4). This suggests that the increase in productivity experienced by the companies due to their investments in IT and organizational change is in part given back to the employees. More specifically, the researchers looked at three forms of organizational change: restructuring of departments, changes in the management structure (such as flattening hierarchies), and outsourcing parts of their production process. They also looked at different components of IT such as personal computers, laptops, and the Internet. They found that use of rather advanced technologies, like the Internet or Intranet, was connected with higher wages. In contrast, use of scanners had a significantly negative impact on wages. Any

[106] This empirical information is based on the IAB manager study (IAB Führungskräfte Studie).
[107] The so-called "BIBB/IAB-data set" was collected by the German Federal Institute for Vocational Training („Bundesinstitut für Berufsbildung (BIBB)) and the Employment Research Institute (IAB).

impact of IT on the wage of highly educated employees was not seen. This suggests that today a high level of education accompanies an intensive use of modern ICT and is therefore not a reason for a raise of salary. Their survey of individuals confirmed earlier results from a company-level study (Cappelli and Carter 2000) that employees do not gain from organizational changes if they do not use IT on the job. For example, outsourcing actions or department restructurings lead to higher wages only for IT users. Interestingly, the personal workplace does not have to be involved directly in the reorganization process in order for the employee to profit from the restructuring through a higher wage level (Bertschek and Spitz 2003).

In a quantitative empirical study based on Microcensus data, the effect of two forms of flexible employment conditions, part-time employment and temporary employment, on income inequality was researched. Regular – as opposed to marginal – part-time employment seems to have only slightly negative effects on income inequality and is balanced by relatively freedom concerning the set-up of the work schedule. This is especially true for women in part-time employment. Men, in contrast, are much more affected by income inequality when they work part-time. The result for men and women is also negative regarding temporary employment. This form of employment is very much underprivileged and correlates with significantly lower income (Groß 2000).

Inequalities in the labor market are not only expressed by inequalities in income but touch other dimensions of labor as well. Kratzer, a researcher at the Institute of Social Scientific Research in Munich, emphasizes the tendencies of polarization of labor in this context. He argues that the increasing pluralization of labor can be considered a polarization of labor which leads to higher inequality in the labor market. This inequality is not necessarily new. Moreover, the existing inequalities are reinforced. Kratzer points to an important aspect of this development by calling attention to the ambiguity of differences. For example, there is an ambiguity in temporary employment. Highly skilled workers who are only temporarilly employed do not face the amount of insecurity and precarious risk faced by less-skilled workers, who have to fear that the temporary employment might turn into a long term problem. Highly skilled workers can always hope that their temporary employment only expresses a brief passage of their career and will eventually change into employment of long tenure (Kratzer 2004).

6.5 Conclusion: From Superficial to Pervasive Flexibility

The starting point of this chapter was the quote from Herr Pfeiffer from German Soft Corp:

> "If you are a little bit flexible here, then you receive all conveniences. It is a give and take. And this is fun and this is nice!" (Herr Pfeiffer, 32 years old, German Soft Corp)

It should have become clear that this quote needs to be regarded somewhat critically and questioned on the basis of what we have seen about the effect of flexibility on employees.

Since about the 1970s there has been a large movement towards flexible employment relationships. This *structural* increase of flexibility had several reasons. One important reason is the rising employment rates of women.

Using empirical data, mainly concentrating on IT workers, I have shown how flexible employment relationships do not represent the actual flexibility within employment relations today. Rather, there are various points of contacts that suggest a *pervasive* flexibility in employment relations. This is the kind of flexibility represented in the quote above. However, that this is not inevitably "nice" for all employees affected by employment flexibility has been shown in my analysis.

The general developments in the workplace support this thesis of pervasive and widespread flexibility. For example, employees view themselves as project workers, the in-formalization of management and communication is being formalized, and the loyalty of employees toward their company is decreasing. I would describe these changes as a movement from superficial to pervasive flexibility.

Regarding the relationship between external and internal labor markets, as flexible reaction between market forces and company demands, the same conclusion holds true. There is a complexity of pervasive flexibility. Most important, internal labor markets still play an important role despite other predictions. The relationship between external and internal labor markets can be described as becoming interdependendent. I have described this process earlier as flexibility between external and internal labor markets.

The IT industry reflects how unions, labor representation, and intermediaries are moving toward complex flexibility concerning institutional premises and employees' needs. All in all, this is a pervasive process as well. Especially concerning the education and training system of employees, reflexibility and flexibility are necessary. Increased subjectivity of workers accompanies the increasing dependence on technology. The

flexibility of workers' important role with customers and the flexibility seen in reorganization of management and use of teams are interwoven with management practices – more evidence of a trend toward pervasive flexibility.

When dealing with employment flexibility today it is important to keep in mind the following:

> "Ultimately, labour flexibility is about control. You wish to be flexible on your terms; you want me to be flexible on your terms; and vice versa. When someone calls on workers or on employers to be flexible, it usually means he wants them to make concessions" (Standing 1999, 81).

7 Time

When speaking about increasing labor flexibility the rising flexibility of work time comes to mind at first. Trends of growing flexibility of time have been evident across almost all occupations and industries. The goal of this chapter is to give an overview of the latest discussions and empirical trends regarding flexibility in work time. I consider the current developments in two broad categories: individual and economic. Many studies do not consider these categories separately, but it is helpful to do so because increasing flexibility has different outcomes for individuals and for the economy as a whole. In order to distinguish between negative and positive outcomes and effects, it is important to differentiate between individual and economic aspects. Some developments might be positive for the economy but negative for the individual and vice versa.

7.1 Individual Dimension

Regarding the individual dimension of the increasing flexibility concepts of work time, work-life balance, and careers are important topics. Not only are the individual flexible work time systems themselves becoming more flexible, but the coexistence of flexible systems results in a more overall flexibility within the entire time system. Also, flexible work time is not per se sufficient to balance work and private life. Finally, the current empirical and theoretical focus on the labor market misses important aspects of change because it is often not sufficiently based on the life course but instead looks too much at employment and occupational developments, independent of the people who perform the work. To consider the overall impact of flexibility calls for an examination of the life courses and careers of individuals.

7.1.1 Work Time Concepts

Work time has always been somewhat flexible. In fact, there are specific fields where flexible work times have always been standard, for example within the service sector or within retail industry. The difference today is that flexibility is spreading across more groups of workers and is developing into various different forms (Ozaki 1999, 26). Seifert sees the most radical upheaval during the last decades in the allocation of work time. The flexible allocation of work time is the most important change in employment policies, replacing the principle of relatively equal schedules of work time (Seifert 2005, 40). Flexible allocation of work time is also often viewed as the most important aspect of internal flexibility. A recent study in Germany shows that

the company policies about allocating flexible work time dominate within strategic actions of a company regarding organization of work. Flexible allocation of work time even is present in companies that focus on flexibility through dismissals, also referred to as the hiring and firing policy (Hohendanner and Bellmann 2006).

The flexible work hours concept is the historical starting point of modern flexible work time concepts. With flexible work hours, the start and end times of a work day are changed from fixed to variable times. This concept was introduced in the 1960s (Seifert 1998). Today, this relatively limited flexible arrangement has new variations that make it even more flexible. One of these variations is the so-called work time account. This flexible work time arrangement has gained importance and has become more widely used in companies in the last last 15-20 years. According to Groß et al. (2000), in 2000, about 37 percent of German employees have work time accounts, and a work time account exists in some form in at least 60 percent of all companies. Another empirical study gives hints that the concept of work time accounts is especially prevalent within human intensive large companies with established mechanisms for workers' representation. However, this study showed that work time accounts are less often used when there is a high proportion of women employees and an established high number of hours of weekly work time (beyond the contractual weekly work time) negatively influence the existence of working time accounts (Ludewig 2001).[108] Employees with a contractual weekly work time of about 35 to 40 hours are most likely to have a work time account. The existence of work time accounts in Germany shows that there is a coexistence of regulation and deregulation concerning flexible work time: where work time flexibility exists, there has been a deregulation of a previous inflexible arrangement and the work time accounts, for example, are a new form of regulating (flexible) work time (Groß et al. 2000).

A more recent work time concept is organizing work time based on trust. In this case, not the actual time takes the center stage but the results of the work. An employee's job is not defined according to hours worked but according to objectives. Many critics of this concept fear a massive increase of work time and an erosion of current work time standards. These critics can usually be found in unions and among union sympathizers. The supporters of the trust-concept on the employers' side promote

[108] According to Seifert empirical studies' reports of companies or employees with work time accounts vary from 30 to 70 percent, as a result of a rather unclear definition of working time accounts in empirical studies (Seifert 2005, 48).

the individual freedom for the employees and the new evolving importance placed on work satisfaction. But the management does not uniformly support the trust concept. Middle management, especially, fears a loss of control about their employees. In Germany, despite the fact that the trust concepts fits right in modern work time arrangements of increasing flexibility in work time, it is not likely that this concept will spread widely. Concerns of both employees and part of the management hinder the widespread implementation of this concept. The implementation of the trust concept of working time in some companies has confirmed fears about the concept. The situation in other companies corresponds to positive prognoses of the supporters of the concept (Böhm et al. 2004, 219ff.). Noteworthy is the observation that in many companies employees continue to be orientated to the standard work time arrangement even when the trust concept is introduced. For example, the employees still note their work time, although they do it personally, instead of through a system centrally organized by the management. Thus, for a total reorganization of working time arrangements using the trust concept, it is important to address: the organizational arrangements and the specific tasks of the work as well as a parallel change of the corporate culture which promotes values that agree with the concept. In addition, a good working team and group structure that is based on cooperation has a positive influence on the success of the trust concept of work time. Böhm et al. (2004) came to the conclusion that the trust concept must be understood as a "collective project of the extension of a varied action of working time" (Böhm et al. 2004, 226) in order to be successful. In their case study the negative examples of the trust concept outweighed the positive outcomes. Nevertheless, there are chances for positive outcomes of the concept given specific preconditions. Among others, these preconditions include a clear definition of job performance, developed by the company with the participation of the employees. Also, a plurality of work times (variations among hours worked by employees) must be accepted within the company. The good communication among employees, between employees and management, and between different management levels are also a precondition of an efficient trust concept (Böhm et al. 2004, 219).

In German Dev Corp three different flexible work time concepts coexist. Using three approaches creates even more flexibility in an environment with already flexible approaches to work time and therefore confirms results of other empirical studies. The overtime account was introduced more than 10 years ago in German Dev Corp. Under this concept, workers can collect up to 60 hours of overtime. As soon as they have

reached 60 hours the employees are warned by the management. Because the employees independently take note of their work time (as opposed to submitting time cards), some hours are not recorded by the employees to avoid the warning by the management. The management provides the possibility to go over the maximum of 60 hours in account for a specific period of time. But this process is rather bureaucratic and a lot of employees avoid this step by not writing down some of their hours worked on long days. Therefore, the overtime account concept in German Dev Corp effectively leads to employees' working more hours than officially reported. Because some employees work too much, the company introduced a second flexible work time concept that coexists with the overtime account system. In this trust concept the company removes some employees from the time-keeping requirements. For these employees, work time does not influence their income. The achievement of objectives is the main goal of the employee's tasks, not hours worked. A third and newly introduced work time model is also focused on the achievements of objectives instead of the actual work time. Within this model of the trust concept, ten percent of the employee's income is initially withheld, with payment being contingent on achieving objectives. As an incentive, the employee can earn between 105 and 110 percent of his or her income at the end of the year if specific objectives have been achieved. But for software developers this model is not very attractive because the margin of extra pay is not high enough.

All in all, this example shows how the flexibility of work time reaches a new level. The coexistence of flexible work time concepts is the tip of the iceberg in the development of flexible work time. But this example also suggests that these developments are not moving toward a more employee friendly work time concept but instead are aimed at helping the employer to optimize the use of work time.

The quote of a software developer from German Soft Corp supports this argument:

> "I regret that my private life is affected because of my intense work life. But I also don't know how and what I could have made different. That's really difficult!" (Herr Meier, 40 years old, German Soft Corp)

As stated above, a positive development for employees depends on the institutional framework and the willingness of the management to adapt the corporate culture while providing employee friendly concepts.

In Germany, the issue of work time has traditionally been an important topic for unions, which were very involved in negotiating work time regulations during the last decades. Today, this situation has somewhat changed. Employers and employers'

associations have become more and more important in setting up of work time arrangements (Seifert 2005, 41). One reason for this development is seen in the resistance of unions to work time arrangements based on trust. By resisting the entire concept of work time arrangements unions are limiting themselves in influencing the specific set up of these concepts (Böhm et al. 2004). The result of this development that concerns over costs and benefits have predominated when setting up modern work time approaches. Thus, this development of an increasing influence of employers and employers' associations and a decreasing influence of unions reflects the increasing economic influence on work time arrangements (Seifert 2005, 41).

All in all, Seifert sees work time arrangements being more controlled and enforced (Seifert 2001). Flexible work time arrangements do not evolve in a vacuum, but are always embedded in regulative and institutional frameworks. The effects of flexible work time arrangements on employees and employers depend on those frameworks as well as on corporate culture. If, for example, the corporate culture of a company supports overtime as a sign of special engagement in the job – which is the reality in many companies and especially for highly educated professionals – this would contradict a work time concept based on trust. Because a well functioning trust concept would imply that employees might even need a shorter time to perform their tasks. But the corporate culture described above would keep them from using this opportunity, because the corporate culture would suggest continuing working and with that performing better than expected at first. This, in turn, is likely to lead to an increase in expectations by the management. This is an example of how a corporate culture that does not fit into a specific work time concept contradicts the goals of the modern concept. Depending on how new concepts fit in existing frameworks or on how the involved actors reflect and possibly change institutional preconditions, flexible work time arrangements may have either positive or negative effects for the involved actors.

7.1.2 Work-Life Balance

> "How do you balance your work and private life?"
>
> "Oh, I was afraid of that question. … I leave the house at about eight o'clock in the morning and come home after work not earlier than at eight most of the time. My husband is self-employed. He works a lot, too. But he usually leaves the house somewhat earlier and is already at home when I come home. Our free time is limited to the weekends. I try not to work at weekends. This happens sometimes but I really try to avoid that. I always resolve to take some more time for activities I like and for example do sports sometimes in the evenings. But this cost me quite some effort. And when I think about it, maybe that we could

> go to the movies with friends sometimes … I mean, they are as busy as we are. They don't have time during the week anymore as well. I believe it is this way today. With my parents it was different. They worked and partied. When I think about it … in my closest circle of friends there is nobody with kids. And within the circle of a little bit more distant friends, those who have kids don't work in leading positions. They have studied as well[109], but there it is different with the professional career." (Frau Schmidt, 40 years old, German Dev Corp)

This story told by Frau Schmidt illustrates the situation of many software developers in her age. This quote clearly suggests that she has not yet engaged in rethinking concerning the need to balance work and private life. The topic of a need to balance work and private life is relatively new in social science research and policy discussions. But the conflicts of work-life balance are not a new phenomenon for software developers. My 82-year-old interview partner even found that this aspect was more problematic a few decades ago.

> "In the old days, family life was somewhat strapped because, well, in that time to use the computer you had to schedule a time when it was convenient and often it would be late at night and hours were not regular. I could go in later and work evening hours. Work hours were variable. Because at that time, we did not have the computer operating systems, that allowed several people to work at the same computer at the same time. There was only one user at the same time. Sometimes in order to do a certain computer work, we had to travel to another location where a different computer was available, so I traveled a fair amount of time. But things worked out. And then it got better, because computer operating systems allowed more than one user at a time and work could be done online through a different location." (George, 82 years old, US Stat Corp)

This is an indicator that modern ICT play a specific role in the context of balancing out professional and private life. Because more and more occupations rely on technologies, the problem of not having a separation between work and private life, which already existed in the software developing field, is reaching more and more occupations. Flexible work time concepts are one possibility for addressing this problem.

Promberger et al. (2002) question the widely accepted public and scientific statements that flexible work time is especially valuable for balancing out family and professional life. The researchers showed that there are aspects of flexible work time that really help to balance private and professional life, but that there are aspects as well that might even hinder the compatibility of both spheres of life. They argue that for flexible work time concepts to successfully support work-life balance, it is important to

[109] This means having achieved a university degree as opposed to having completed (only) an apprenticeship system.

have reasonable organizational procedures, active working councils, and a management that supports the family-oriented arrangement of working time. If these aspects do not exist, flexible work time concepts can even develop into the opposite of family-friendly time arrangements. Therefore, only the interplay of appropriate concepts, a corresponding corporate culture, and a functioning worker's support mechanism leads to a positive influence of flexible work time concepts on balancing work and private life (Promberger et al. 2002).

The enormous impact of the company philosophy on work time is shown by an example presented by one of my interview partners. Jim told me that his friends who work at Microsoft work 18 hours a day. He explained that they have a complete different company philosophy at Microsoft than at US Stat Corp, which does not promote this kind of working commitment.

> "They [US Stat Corp managers] want you to have a kind of balanced life and it seems to work. A lot of people here have kids and they want to make sure that they aren't neglecting their families. Friends at other software companies, towards the end [of a project], a lot of companies they are very deadline oriented; they work a lot."
>
> "So, how much is the regular work time at your company?"
>
> "Normal people work around 40 maybe 45 hours."
>
> "Do you work about that long?"
>
> "Oh, yeah … well, yes and no. Somebody might work 35 hours one week and 45 hours next week. And there is like … I do not have any kids; I work 50 or 60 hours, but I like it!" (Jim, 31 years old, US Stat Corp)

Jim differentiates between "normal" people who work regular hours and more engaged people who work more. Concerning career perspectives, income, benefits, and so forth, The difference between "normal" people and more engaged people remains unclear. But it seems that the lack of management pressure in Jim's company leads to an implicit willingness to work more. Both companies use the trust concept of work time but the results in the two companies seem to differ. This difference might be caused by differing company philosophy. US Stat Corp promotes a balanced work and private life, although it seems that families have a priority here. From Jim's impression Microsoft is so harsh regarding its company philosophy concerning work time, it would sell its own grandmother if it helped get a project done.

In line with the above discussed research results is a study about social and ecological consequences of the growing flexibility of work time (Eberling 1998, Eberling and Henckel 2001). On the basis of a qualitative empirical study researchers discuss the social consequences of changing the time structure. Their results showed

that the differentiation of individual time patterns, which mainly concerns work time patterns, led to a social desynchronization which in turn led to social problems. With social desynchronization the authors refer to, for example, incompatible work schedules of family members and unclear time frames for free time. Thus, again the result is that the increasing flexibility of work time is more problems in balancing family life with work life. The researchers therefore plead for socially acceptable synchronization of time for the involved actors (Eberling 1998, Eberling and Henckel 2001).

In chapter 5 I introduced the "workforce entrepreneur concept" by Voß and Pongratz (1998) in the context of the increasing need of subjectivity for employees to perform their work. The "work force entrepreneur concept" also addresses the question about a work-life-balance because it promotes loosening boundaries between work and private life. However, according to Henninger (2005) the concept misses important aspects concerning the work-life balance because it does not see the institutionalized necessities of private life, such as child care or domestic work. The "workforce entrepreneur concept" suggests that private life is the same as free time, which is not the reality for most employees, especially not for most women (Henninger 2005). Whereas Voß and Pongratz promote a rather negative scenario resulting from loosening boundaries between work and private life, other studies show a rather positive influence on the compatibility between work and private life with what they call "portfolio work," a term used for the work of the workforce entrepreneur. In consequence, Henninger notes that the most important question to ask might not be whether this kind of work arrangement has a positive or negative outcome on the individuals, but rather how these kinds of workers actually arrange their work and private life and what role gender plays in the outcomes for the portfolio worker or workforce entrepreneur. Henninger concludes that on the basis of her interview material there is no general tendency towards loosening boundaries between work and private life, if private life is understood as free time. There are various restrictions set by actors, for example the need to take care of children or simply self-set restrictions concerning a dissociation of private and work life. Interestingly, freelancers without children who work alone have a relatively high level of loosen boundaries between work life and free time. If they are in a relationship, their partners need to have a similar orientation towards his or her job (Henninger 2005).

Along with the institutional and organizational aspects of work that affect the balance with private life, another subjective dimension, was expressed by Herr Lang:

> "You do not only have to deal with that concerning time management issues, but you have to deal with that in your head. You have to stop working with your head. This is not easy. I needed years to learn that. It is important and it is possible." (Herr Lang, 35 years old, German Soft Corp)

This quote impressively demonstrates that people with different personalities create different work time arrangements to help manage the balance between work and private life.

7.1.3 Careers

As already mentioned in chapter 2 I adhere to the understanding of careers as "sequences of work experience over time" as put forth by Arthur and Rousseau (1996). The perspective on changes is not the job but collected professional experience over time. The career is described as boundaryless, which refers to the current situation of companies being more and more organized in networks without defined boundaries. Another dimension of the boundaryless career is the increasingly missing orientation toward job definitions for describing a person's work history. Therefore, the new career concept substantially differs from the traditional career concept. In the past, the concept of a career traditionally referred to a process of moving up the ladder in one kind of profession, usually also in one company or at least in one industry sector. In contrast, I understand modern career patterns as an aspect of labor restructuring in informational capitalism in which elapsed time gains importance and hierarchy becomes less important. It is not necessarily possible to define a person's career history or future career pattern on the basis of his or her current job situation. With the traditional understanding of careers this was easier. The work life over time instead of the current hierarchical level is becoming important when regarding the specific trends of careers. Furthermore, it is not only a person's employment status within an organization but also the tasks he or she performs at work which constitute a career. This is evident in my case study because some of my interview partners had stable jobs with a rather long tenure and promotions within the organizational hierarchy. But regarding their tasks, the greater flexibility came into play when regarding the requirements of their work tasks and contents of their work. My interviewees work tasks changed regularly and often developed in different directions from their original tasks. Their career exists from elements of the traditional understanding of careers as well as from the modern understanding that is not necessarily oriented to the organizational structure of their employment. Even if employment is relatively stable, the tasks change constantly,

which is a development closely connected with modern ICT. The career concept as a whole consists of stable and flexible elements which react to each other.

I view software developers' careers as precursors of this trend in modern careers because the development of careers in that direction is closely connected to technological changes. Therefore, while careers of software developers are leading the changes, there are signs that this process will also take over the career paths of other occupational fields, because more and more occupations are dependent on technological changes. The increasing flexibility of time is one of the most important results of technological changes. The interviewed software developers provide examples of job definitions that are missing and that are subject to major change. An example is the change from a programming to a management career.[110] In addition, more and more people are changing career paths and jobs in the middle of their professional life. This situation needs to be accompanied by changes in lifelong learning and training possibilities (chapter 5).

One important consequence of the growing orientation towards careers can be seen in future challenges for labor market policy. As Benner (2002) points out, labor policy needs to focus on careers rather than on jobs. One move in that direction would be for public policy to more directly address labor market intermediaries. As mentioned in chapter 1 labor market intermediaries are gaining importance in the labor market. Intermediaries are third actors[111] in the labor market who are able to make up for the recent developments towards instability and volatility of the labor market. Intermediaries understand the importance of focusing on careers and personal development rather than on single occupations (Benner 2002). Some intermediaries like unions need to move forward in this direction more energetically.

The problems of ups and downs in people's professional careers used to be a problem of the lower end of the work force. Now, however, this problem of volatility is increasingly coming into play for employees in the middle and higher end of the work force (Benner 2002) and needs to be addressed by future labor market policy.[112]

[110] In principle, this development has existed among other occupational groups like mechanical engineers before, but it is interesting how it becomes more and more common in other fields as well, where a clear barrier used to exist between the professional/technical worker and the manager.

[111] The traditional actors of the labor market are employers and employees. Benner demonstrates how intermediaries can be viewed as important third actors of the labor market (Benner 2002).

[112] This very important aspect of careers clearly requires more empirical research – qualitative as well as quantitative. It was not the sole focus of this study and could therefore only be introduced. A thorough survey to bring light into this field would be very important to address, though.

7.2 Economic Dimension

The standardization and simultaneous reduction of work time has taken place in industrial nations over a period of about 150 years (Lehndorff 2002). It represents a decoupling of work time from the market. Along with the regulation of work time came a reorganization of social time arrangements. An example is the campaign by the German unions for a free Saturday for fathers during the 1950s.

The increasing direct influence of the market on employees which I discussed in chapter 1, has resulted in time being an increasingly important parameter of competition. This, in turn, leads to new arrangements of work time. The core of these new arrangements is the direct coupling of the individual work time of the employee to the market. The era of a decoupling of labor time from the market is therefore coming to an end. The increasing requirements in the direction of flexible work time are leading to increasing individualization of time flexibility. Lehndorff (2001, 2002) differentiates between passive and active flexibility concerning work time. Passive flexibility describes the flexibility faced by the lower-skilled workers and addresses a need for being available for the employer. Passive or involuntary flexibility applies in jobs with highly differentiated functions, that is functional differentiation, and a fragmentation of work time. Active or voluntary flexibility applies to the working capacity of highly qualified workers and includes a high potential for the employee's participation and initiative. In addition, active flexibility is associated with stable employment conditions and a low amount of functional differentiation. With the market's increasing control of work both passive and active flexibility as well as changes in the structures of job qualifications have led to a division of labor among workers at the lower end of the work force and a concentration of work time on individuals at the upper end of the work force (Lehndorff 2001, 2002). Lehndorff offers an analysis of how trends in work time have affected the social organization of work. One aspect of his analysis is that the male is still considered the breadwinner in a marriage, a situation that is supported by part-time work for women and increasing hours of work for men. Thus, new tendencies of work organization, such as flexible work hours, in combination with the influx of women into the labor market in part-time and precarious employment conditions are leading to a slow polarization of work time. Lehndorff argues that supporting individuals in the work force, especially concerning their sustainability, is an important goal for developing work times in order to optimally use the working capacity of individuals. In addition, he propagates a combination of individual configurations of

work time and reduced regular working time in order to reduce the traditional division of work time amounts for women and men (Lehndorff 2001, 2002).

In the line with Lehndorff's findings are the results of an empirical study from the Institute Work and Technology (IAT). The study shows that the standardized work time arrangements dissolve in the lower and upper ends of the work force (Nordhause-Janz and Pekruhl 2000). In her article about the loosening boundaries of work and work time Wagner (2001) also emphasizes the inconsistency of the development. The subjectively sensed increasing supremacy of working times comes along with an increasing dependency on requirements of the companies. As people feel that their lives are increasingly dominated by work time, they also feel an increased dependency on the requirements of their employers.

Regarding the various systems of flexible work time Smentek (1991) discovered a disparity between what he calls the capitalist time economy versus the social time structure. He differentiates between traditional and new flexible work time arrangements. The traditional work time concepts focused on regulating closing time and weekend work, components of work time that have an important impact on social time. The new flexibility work time concepts address the variability of duration of work time as well as the short notice given to people who are going to be laid off or terminated. These aspects of work time make it more difficult to plan work and private time and consequently intrude on an individual's social time. Because of the conflict between the capitalist time economy concept and the social time structure Smentek pleads for the active intervention of unions. Unions need to work to achieve collective agreements that support greater compatibility between both time concepts (Smentek 1991).

Starting from the assumption that the crisis of Fordism is mainly a crisis of temporal and spatial aspects, Harvey talks about the "time-space compression in the capitalist world" (Harvey 1990, 147), referring to the shortened time horizons of private and public decision-making. Modern ICT makes it possible to disseminate decisions instantly, at the same time the decisions are made. Higher flexibility and mobility gives employers increased power to put greater pressure of labor control on the workforce. Harvey pleads for flexible accumulation as a new mode of economic practice (Harvey 1990, 196). That way it would be possible to reach a medium-termed stability within the current regime of accumulation.

The economic dimension of time also calls attention to pace. The increasing pace of production is closely connected with an overall increase in productivity. “Productivity is going up as people work faster, not just as technology improves” said Lee Price of the Economic Policy Institute in Washington, DC, in March 2004. He supported his thesis with a November 2003 statement by Alan Greenspan, who saw an unusual amount of caution among businesses to employ more workers, a situation that led to pressure on workers and facilities. Such pressure cannot be sustained over a long time period. Lee also referred to the president’s economic report from 2004 which assumed that companies would find a way to generate extra work effort for a specific time because they were unsure if the increasing demand would last (Price 2004). One of my interview partners had a similar explanation when I asked him about how he responded to the increasing productivity demands.

> “I could do more things. I could work faster. The procedures and the task were much more rapid.” (George, 82 years old, US Stat Corp).

These general tendencies of work time developments on the economic level can be seen by looking at, for example, the development of temporary employment, turnovers, and the volume of work.

7.2.1 Temporary Employment

In Germany, an unlimited employment includes considerable benefits and job security for employees compared to the situation in the United States where legal protection is less distinct. Therefore, a temporary employment contract in contrast to an unlimited employment contract is a relatively insecure employment relationship in Germany. Nevertheless, the institutional and legal changes in Germany have provided more possibilities for employers to offer temporary employment contracts. Employers, for example, can offer a temporary employment contract without an objective reason. This used to be possible only for new positions. Today, this is possible if between the last temporary position and the new temporary position is a period of at least two years. In addition, the rules concerning temporary employment have changed for employees who are older than 51 years. Providing an objective reason for a limitation of the employment contract is not necessary for employees who are older than 51 years (BMWA 2005). Politicians have given these accommodations to employers with the hope of increasing hiring by companies.

Based on data from the socio-economic panel Giesecke and Groß (2006) have found that temporary employment is not a mass phenomenon yet. Only 5 to 7 percent of

all employees with an employment contract have a temporary employment contract in Germany. The OECD presents different results, stating that the percentage of temporary employment in Germany has risen from a little bit below 10 percent in 1985 to about 12 percent in 2000 (OECD 2002).[113] Even if the total amount of temporary employment is not very high Giesecke and Groß (2006) argue that it is still important to consider the consequences of temporary employment, because it is one aspect of increased flexibility of employment relationships. The authors assume that consequences of other aspects of flexibility might be similar to those from temporary employment. They point out that the results of the study of temporary employment are valuable because they can be transferred to other kinds of flexible employment relationships. The likelihood of temporary employment differs according to individuals' qualifications and age. A middle aged, high qualified employee is less likely to be temporarily employed than are other groups. Young and old employees as well as poorly qualified employees are more likely to being temporarily employed. In large companies and in public service there is a higher amount of temporary employment than in small businesses and in the private sector. Despite the fact that the majority of temporarily employed people become permanentaly employed, the risk of becoming unemployed or being temporarily employed again is relatively high. Particularly in public service, the risk of becoming temporarily employed again is high for individuals at all qualification levels. In public service jobs the risk of becoming unemployed is higher as well; however, this risk is concentrated on the lower qualification level. These trends regarding temporary employment can be considered as being disadvantageous for employees (Giesecke and Groß 2006).

Giesecke and Groß (2005) differentiate between a strengthening and a restructuring of social inequality due to the new German reforms of the labor market. The social inequality is restructured because individual income differences are increasing. The reason for this change is that the increasing employment insecurity diminishes the individual bargaining position. The strengthening of social inequality in Germany is the result of a growing gap between capital income and wages. The intensified social inequality is also based on a weakening of the individual bargaining position, which in turn leads to a weakened bargaining position of unions. In addition, there is a group-specific income spread. The empirical evidence behind these

[113] This different information shows the difficulty of defining and measuring temporary employment. However, both studies confirm a rise in temporary employment contracts over time.

conclusions also provided evidence for the researchers' study of temporary employment. Giesecke and Groß (2005) show that the individual income difference of workers are greater for employees who are temporarily employed than for employees with a permanent employment relationship. This leads to an intensification of the already observed increasing insecurity regarding the socioeconomic position in society.

Mertens and McGinnity (2005) researched the impact of temporary employment on income in Germany. Overall, they found temporary employment was associated with lower income for employees. However, they emphasize that the absolute differences in income do not quite reflect reality. The 32 percent less income for men in West Germany reduces to about 6 percent when controlled for specific differences.[114] For example, there are differences between employment sectors. Temporary employees are paid less in the service and retail sector compared to the production sector. This effect is more pronounced for men than for women. Also, controlling for the relative level of income shows that the negative impacts of temporary employment are much higher for less well-qualified employees in the low segment of income than for highly educated people who are in the higher income bracket. Therefore, considering the impact of temporary employment on income, another component producing polarization between qualified and less qualified people becomes apparent, leading to reinforcement of existing inequalities.

In addition, temporary workers have de facto fewer benefits compared to permanent employees. They are also less satisfied with their job, especially concerning the variables of pay and job security. They complain about inflexible work schedules and having to perform monotonous work tasks (OECD 2002).

In the United States, officially registered temporary employment hardly plays a role according to OECD data. These data even show a slight decrease in temporary employment of about five per cent in 1995 to about four per cent in 2000 (OECD 2002).

Another indication of a different role of the temporary workforce in the United States compared to Germany is that studies include different groups of workers when talking about temporary workers. In the United States, the temporary workforce is mainly associated with contract workers, independent contractors, self-employed workers, freelancers, entrepreneurs, and contingent workers. These groups of temporary employees are not legally classified as employees of organizations. Workers in another

[114] The OECD gives an average of 17 percent as the noncontrolled income difference between temporary and permanent employees in Germany (OECD 2002).

group of temporary workers are employed by the company and therefore have a legal status as employees with that specific company. The status of agency temporary workers is ambiguous. On the one hand it is comparable to the status of an employed temporary worker, because agency workers can relatively easily make claims to the legal status of regular temporary employees (Broschak and Davis-Blake 2006). On the other hand, the group is in the category of a contingent workforce because agency workers do not have a direct legal connection to the company to which they are assigned to perform their work. A US study about high-qualified contingent workers, for example, finds the following important attributes for contingent professionals. First, they are clearly detached from permanent jobs and are aware of the enormous obsolescence of their skills and knowledge (Rassuli 2005). This is important, because it emphasizes the independence of their skills and knowledge from the company. Overall, the study about contingent professionals reaches to a positive conclusion concerning the employees' motivation and professional success (Rassuli 2005). This positive perspective reveals how the discussion about the temporary workforce needs to pay attention to both the professional status of temporary employed persons and the legal status of temporary workers in order to make judgments about the consequences of temporary work.

In sum, temporary employment, understood as legal employment with a specific company, is one aspect of flexible labor which has importance in Germany, but does not play a very important role in the United States. There, temporary workers are not legally classified as employees and temporary workers such as contingent workers are more common. Overall, in Germany temporary employment is relevant for specific age groups and sectors. The risk of losing one's job or of being repeatedly temporarily employed is correlated with one's level of qualification. Temporary employment has fewer benefits, less security, less job satisfaction and more monotonous work. From the employee's point of view it can therefore be judged as a disadvantageous employment relationship.

7.2.2 Turnovers and Job Tenure

Short job tenure and high turnover potential are often viewed as important elements for a modern and flexible labor market where knowledge and skills become obsolete quickly and companies are constantly under pressure from the market. Employer representatives therefore argue for less regulation and sanctions for

terminating employees. In contrast, employees prefer long job tenure and a high job security. A study about occupational mobility and the process of change showed that changing employers as well as occupations can have positive effects for employees. However, this outcome mainly applies to employees with high education and qualifications and with a high occupational status. Also, positive effects of changing occupations or employers are mostly connected with changes that are self-determined and instigated by the employees themselves. But mobility that is forced by the employer because of economic factors often has negative effects for the employees (Hecker 2000). The current economic developments within informational capitalism therefore suggest rather negative effects for employees as a result of forced turnovers. Nevertheless, from an institutional but also from an ideological perspective, between Germany and the United States there is a difference in experience concerning labor turnover and job tenure. In Germany, employees have relatively high institutional protection against easy dismissals. The government has established regulations regarding turnovers, so that if a company wants to fire a worker the company must comply with strict obligations. These rules have somewhat softened during recent years, but compared to the United States, strict government restrictions to protect employers against being fired are still in place. Also, the role of collective bargaining is still important in Germany. Collective wage agreements in general apply to entire sectors. Often a collective wage agreement in one sector serves as a precedent for future negotiations in another sector. In 2004, 68 percent of all employees in Western Germany worked in companies with a collective pay commitment, and 53 percent of employees in Eastern Germany worked in companies with a collective pay commitment (WSI Tarifarchiv 2005).[115] An empirical study by Erlinghagen and Knuth (2002, 2003) confirms that the German labor market is relatively stable.[116] The labor turnover rate is higher in small businesses compared to large corporations. But between 1975 and 1995 these distinctions related to the size of the companies declined. In the 1970s, the labor turnover rate in Germany was at about 30 to 31 percent. It declined until the mid-eighties to approximately 24 percent, then climbed back to its high in 1990 at about 31

[115] The commitments are divided by sectors and firms. In Western Germany 7 percent of these commitments were only firm-specific pay commitments. In Eastern Germany 12 percent were based on a company agreement only (WSI Tarifarchiv 2005).

[116] The study is based on the IAB-employee sample ("IAB-Beschäftigtenstichprobe") 1975-1995. This sample includes only regular employees who are subject to social insurance contribution, which is important to consider when interpreting the results of the study, because the flexible, volatile part of the workforce is not included in this sample.

percent. From that time to today the labor turnover rate has decreased again, to approximately 24 percent (Erlinghagen 2002, Erlinghagen and Knuth 2002). The authors give the following reasons for the observation that the German labor market is relatively stable. The higher stability among highly qualified employees compensates for the greater instability seen among workers with low qualifications. Also, the increasing incidence of double-income households leads to a declining job mobility for the household members, because the geographical mobility in Germany is relatively low. Another reason given for the relatively stable labor market situation in Germany is the age of workers. Older employees are less mobile and, because there is a movement towards more older than younger employees, this contributes to declining labor market mobility (Erlinghagen and Knuth 2002, 2003).

Among OECD countries, the permanency of work is least pronounced in the United States, for two main reasons. In relation to Germany, for example, geographical mobility is high in the United States.[117] Also, in the United States not the government but unions are involved in setting up rules concerning turnover. The role of US unions is different than in Germany. Only employees who are members of a union profit from the results of negotiations. Therefore, because a lot of workers are not represented in these union contracts, the restrictions regarding dismissals, for example, do not apply to them and companies can handle their dismissal as they wish (Carnoy 2002). This situation leads to the so-called “hire and fire” company policy. On the one hand it is much more likely to be dismissed in a US than in a German company, but on the other hand it is also much more likely to find new employment because the “hire and fire” mentality also leads to more possibilities of being hired again. Despite the higher chances of getting hired again, the “hire and fire” mentality has a negative effect on US employees, because they are in a much more insecure and volatile situation. A study of the relationship between turnover and diversity among workers in the US service sector shows that isolation from coworkers and customers is associated with turnovers, but diversity of age, sex, or race among workers did not lead to a higher turnover rate (Leonard and Levine 2006).

All in all, employment security is still at a much lower level in the United States, although it is decreasing in Germany.

[117] Compared to European and Japanese workers, the spatial mobility in the United States is highest (Carnoy 2002, 81).

7.2.3 Volume of Work

By the term “volume of work” I refer to the total working time over one’s lifetime. The volume of work declined over the past 30 years, due to, for example, early retirements, shorter workdays, later entry to employment resulting out of longer times in education, and more unemployment. The increasing volume of work represents a rise in flexibility of the life course of individuals. The declining volume of work is often used as an argument in favor of an end of the labor society (Rifkin 1995, Dahrendorf 1983). But the declining volume of work does not correspond to a declining amount of jobs. To the contrary, the number of jobs has increased during the same time the volume of work has declined. But it is true that there is a reduction of work time during a lifetime. This leads to an increase in flexibility of different aspects of life. New definitions of work and life need to be addressed by labor policy (Welsch 2000).

Among aspects of life that are becoming more important is the field of education and training. With the reduction in the overall volume of work during a life time there are more possibilities for spending time in education and training. Using the gained time to participate in lifelong learning is important in order to be successful in informational capitalism (see chapter 5). The possibility of engaging in such participation unfortunately applies only to the highly educated workforce. Less educated people are less likely to find possibilities for training during times of unemployment, because they face more essential problems which hinder them in participating in extra education and training courses. Therefore, this causes a further polarization of the work force.

One example of an institutional cause for a decreasing volume of work over lifetime is the implementation of sabbaticals for employers. This is an example of a flexible use of work time over the life course, showing an adaptation of work time to the needs of employees. Usually, middle-aged workers, especially those in the upper level of the work force, have a very high annual volume of work. Normally, this is also the period of their lives when they have high personal responsibilities and a high desire to participate in various activities. Therefore, sabbaticals are helpful to fulfill some personal wishes of employees and at the same time preserve from early burnout or illnesses. Thus, sabbaticals contribute to positive economic exposure to pressure in the mid-life of workers and are one reason for a declining volume of work.

7.3 Outcome: Flexible Interaction of Flexible Concepts

The analysis of the dimension of time considers individual as well as economic dimensions of the changing role of time in the restructuring of labor in informational capitalism.

Examples related to the individual aspects of time within labor process are work time concepts and the issue of balancing one's work and private life. The analysis provided information about the additional flexibility that occurs when flexible work time concepts coexist. Work time concepts based on trust fit right into current developments of labor in informational capitalism, but there are elements of resistance provisos among both employees and some parts of the management against these concepts. Employees fear exploitation by the modern work time concepts and the managers fear a loss of control.

All together, the state of work time concepts today is a flexible interaction of various different kinds of approaches. My case examples are within the software industry, but all indices show that this is the case for many other industries. But, empirical studies also demonstrate that flexible work time concepts are not, as widely believed, an adequate structure to balance work and private life; further they sometimes even counteract this goal. Corporate culture and institutional frameworks influence the functioning of work-life balance approaches in companies. In addition, it is important for the government to support a beneficial synchronization of work and private life, finding a way to match social time arrangements with time arrangements needed by companies (Smentek 1991). The personality of each employee also has a bearing on how he or she solves the problem of balancing out work and private life.

A third example of how labor restructuring concerning the aspect of time affects individuals is the concept of career changes. With changing careers, time is a more important variable then advancement within a hierarchy. The concept of changing careers includes employment status as well as work tasks. For individual career development, both employment status and work tasks are typically more flexible than a few decades ago. The development of careers of software developers can be viewed as precursors of these new career patterns. In software development, the use of modern ICT plays an important role, a trend that is expected to follow in other career fields.

Standardization and regulation of work time represents a decoupling of labor time from the market. New labor time arrangements, which are not highly regulated, can, then, be viewed as a renewing of the coupling of labor time with the market. It is important to differentiate passive from active work time flexibility, because passive

flexibility is associated with negative effects for employees and active flexibility can have positive effects for employees. Furthermore, this difference seen lead to an increasing polarization of the work force because passive flexibility is often applied to the lower end of the workforce whereas highly qualified workers in the upper segment of the workforce are offered flexibility as an option (Lehndorff 2001, 2002).

Concerning temporary employment, as an example of the economic dimension of time as well as concerning turnovers and job tenure, the situations in Germany and the United States are quite distinct from each other. Temporary employment defined as legally arranged temporary employment hardly plays a role in the United States. There, other forms of temporary employment are much more common. All in all, though, temporary employment is associated with decreasing power of employees in regard to their position towards their employers.

Concerning turnover, the different institutional framework in Germany and the United States becomes very important. But a general statement is still possible. If turnovers are a result of economic and company pressure, they have negative effects for employees. If, however, leaving a job is the result of a free decision of the employee, it can be seen as advantageous for the employee. Regarding the effects of turnovers and job tenure on employees, a powerful union can play an important role to avoid negative effects for workers.

A decreasing volume of work over a lifetime represents the overall increasing flexibility within life. Elements like sabbaticals are reasons for institutionalized reduced labor time over lifetime.

Overall, it is important to keep in mind that the development of the role of time in informational capitalism is closely connected with the development of space and pace.

Summary and Future Prospects

Interpreting current changes in the labor process helps to understand today's society. In this study I concentrated on analyzing developments of the labor process in two countries: the United States and Germany. Both countries are developed nations with a relatively prospering economy. The concept of informational capitalism theoretically describes the economic restructuring of the last decades in these countries. The concept emphasizes the significant role of information and communication and its technology for prevailing restructuring in capitalism and the labor process. For my research I took four interrelated dimensions – space, work, employment, and time – of the labor process into account and analyzed them separately.

Several results of the dimension of space should be recognized in future research. First, territorial space continues to play an important role in the labor process. Therefore, office space and business locations are important variables for planning and managing labor processes. Physical office space and conceptualization, for example, can reflect and reproduce global economic trends of informational capitalism and thereby directly influence workers when working in their office environment. Hence, collecting empirical data regarding the changes in office space could contribute to a better understanding of how office space could support workers in performing their tasks within informational capitalism. The discussion of outsourcing and off-shoring provided insights into the consequences of relocating production processes. Although outsourcing and off-shoring may be economically beneficial for companies, outsourcing and off-shoring are accompanied by various problems for economy and workers when preconditions do not correspond with these activities. Outsourcing and off-shoring are examples for an increasing flexibility of the labor process concerning the dimension of space. Thus, the interplay of institutional frameworks and impacts on workers when realizing outsourcing and off-shoring activities should continuously be considered in future research to be able to prevent negative outcomes for workers. After all, where businesses are located is not a trivial matter. The example of the regional labor market in Silicon Valley showed that not only globalization but also localization play an important role for restructuring the labor process regarding flexible developments of labor.

Although territorial space remains important for the labor process, an emergence of a tele-mediated information space has been observed, a phenomenon that has had considerable impact on how labor is organized. The flexible interplay of territorial and

tele-mediated information space is shaping the spatial aspects of the prevailing labor process. The current debate about the restructuring of the labor process is correctly veering toward the acknowledgment of an increasingly important role of space for economic and labor restructuring. But it also shows that a sophisticated view is important, and there is a need to acknowledge the role of the coexistence of different spaces and the flexible interplay of territorial and tele-mediated information space. The development of networks is an example of how physical and tele-mediated information space creates flexible responses, because networks are indeed an adequate organization structure for informational capitalism. Sometimes, however, one gets the impression that networks are the only adequate organizational structure for today's labor processes, which is not necessarily true. Nevertheless, networks provide a flexible structure that is adequate for many approaches toward labor organization today. Future research concentrating not only on the development of networks but on the interplay of traditional organizational structures and modern network structures could provide important insights into what is important for a well-working interplay of old and new organizational structures.

The dimension of work is important for diagnosing recent developments in the labor process. It is a rather intangible category and not easily quantified, but it is a crucial dimension when trying to provide a comprehensive picture of the labor process. The interviews with US and German software developers provided much information concerning the category of work. First, flexible approaches to work certainly help software developers handle their complex work tasks and work requirements. The interviewees were very much aware of the fundamental restructuring of work during the last decades. Their awareness not only involves work processes on the surface, like the constant engagement in new hardware, software, and network tools. The interviewed software developers also conveyed their awareness of the fundamental restructuring of the labor process that they experienced in more intangible ways. Their reports about the role of communication and the role of the market are examples of how aware software developers are about fundamental restructurings of the labor process. Because they know about the important role of communication in the work process and the increasingly direct impact of the market on their work, they are beginning to deal with these aspects by trying to make these influences productive for their work. They use informal communication as a strategic aspect in organizing their work. Also, they view their customers as a major variable in organizing their daily tasks. Accordingly, it seems

like there is a gentle trend towards legibility of the subsurface of the complex work processes by software developers. Whether software developers will benefit from slowly recognizing and responding to these influences and changes remains unclear and demands further qualitative research. Generally, US and German software developers have a positive attitude towards the flexibility of their work surroundings and do not complain about it. In contrast, they like the flexible changes of their work. However, the statements about their flexible employment conditions were much more critical and were accompanied by fear and the feeling of insecurity and arbitrariness. Overall, the analysis shows that the complexity of work is accompanied by flexibility of the work process.

It is widely agreed that employment has developed into being increasingly flexible. However, a disagreement exists about the need for and the consequences of this flexibility. Some individuals argue that flexible employment is necessary for staying competitive in globalized competition and globalized production structures. They tend to overlook the negative effects on workers that result from implementing flexible employment structures. Others advise against extreme flexibility within employment relationships because of the increasing insecurity and arbitrariness for workers. The data presented in this study reveal that there are negative affects for workers due to increasing volatile and flexible employment relationships. The specific economic effects of flexible employment conditions were not the subject of this study and therefore cannot be fundamentally judged. However, the increasing polarization between unskilled workers and those with high qualifications, between employees with secure employment relationships and those in insecure employment situations is a problematic trend that seems to reinforce existing inequalities. Therefore, these trends are important topics to regard in future research, because they may provide answers helping to prevent an ever increasing polarization due to the increase in flexibility.

It became evident that the widely acknowledged organizational and structural flexibility of employment conditions and employment relationships is slowly pervading the labor process and affecting workers. An example of evidence for this observation is that employees increasingly see themselves as project workers or entrepreneurs even if they are employed full-time and have a standard employment contract. Pervasive flexibility within their employment relationship manifests in feelings of insecurity and volatility as well as in the attitude of being project-oriented. Another example of pervasive flexibility is the increasing informalization within formal employment

conditions and the interplay of flexible and bureaucratic organization principles. In formally bureaucratic organizations we find increasingly informalized structures and the coexistence of both bureaucratic and informal organization principles. Informal structures are generally more flexible than formal organization principles. In start-up companies that begin with an informal structure, bureaucratic organization structures evolve and flexible and inflexible organization principles coexist. The flexibility, thus, becomes more and more diffused within these organizations, although it is not necessary the only or most obvious organizational principle there. All in all, there is evidence that flexibility pervades institutions and education and training programs as well as management practices.

As with their awareness of flexibility in employment individuals are aware of an increasing flexible work time due to the restructuring of economy and society. This study provided evidence that flexibility in work time is increasing. This became obvious with the observation of the coexistence of various flexible work time concepts within organizations. That flexible work time concepts are per se accompanied by a better work-life balance of employees is a commonly accepted prejudice. But as evidence from recent empirical studies showed, institutional and normative frameworks play an important role in how flexible work time concepts affect the work-life balance. The institutional and normative environments need to correspond to the flexible concepts implemented in the organization. Otherwise, flexible work time concepts may have a negative effect on workers. For example, flexible work time may cause increasing stress for employees because of increased expectations and demands by employers. Whether flexible work time results from the preference of the workers or is determined by the management is correlated with the qualification level and occupational status of workers. The imposition of a flexible work time by management more often applies to workers in the lower level of the workforce and with low qualifications. With this “passive flexibility” the worker more likely faces negative effects of flexible work time arrangements. In addition, flexible work time arrangements tend toward reinforcing the traditional gender relationship in labor processes and make the work-life balance harder to achieve instead of more easy to achieve. Although temporary employment is defined differently in the United States and Germany, it is likely in both countries that it accompanies decreasing power of workers toward their employer. The increasing importance of network organization structures and the decreasing role of companies as the organizational unit of the labor process lead to a new definition of careers. Time is

an important variable for this new understanding of careers and replaces hierarchy as the important variable defining career paths. Today, it is important to track the career path of an individual over time. Considering only the current position is not very helpful in getting an idea of the professional career of an individual, because ups and downs are common and the individual's current situation is not significant. Moreover, a worker's entire professional life is important in order to define a professional career today. These aspects of a modern definition of careers should be taken into account in future research.

Finally, two aspects of this study need to be highlighted. First, because the above described trends are based on empirical observation for the US and German labor processes, I was able to provide a picture beyond a specific national situation. The statements of this study do not apply to all countries, but because two countries with quite different institutional backgrounds were considered, it is possible that these trends also apply to other developed countries. This should not hide the fact that many differences within the US and German labor process and the labor market situation exist. The definition of temporary employment discussed in chapter 6 or the differences in income inequality presented in chapter 3 are only two examples of the many differences that exist. However, the overall trends regarding flexibility within these distinct setups of labor and labor markets seem to overlap in many areas. Examining four different dimensions of the labor process revealed numerous similarities, as described, in the current restructuring of the labor market.

Second, the focus on ICT in many areas of the study conveyed a sense of the significant influence technology has on labor. Many of the described trends, for example in the category of space, are in large part dependent on how modern technology is applied within the labor process. In another example, a greater flexibility in work resulting out of the application of modern ICT does not necessarily demand an increasing flexibility in employment relations. Thus, workers may appreciate a flexible work environment with constantly changing demands that are due to the application of new technology, but they may also favor a steady instead of flexible employment relationship without perpetually feeling insecure and volatile. Because software development and other IT-related occupations can be regarded as early indicators for changes, this study should have provided an impression of what other industries and occupations might face in the future.

Appendix A

Data for Figures in Chapter 3: US American and German Labor Market Situations[118]

	GERMAN POPULATION above 15	US POPULATION above 16	GERMAN EMPLOYMENT	US EMPLOYMENT
1970	46898149	137085000	25320000	78678000
1971	47400576	140216000	25149000	79367000
1972	47836086	144126000	26053000	82153000
1973	48342405	147096000	26238000	85064000
1974	48507682	150120000	26097000	86794000
1975	48560587	153153000	25337000	85846000
1976	48778050	156150000	25177000	88752000
1977	49120669	159033000	25351000	92017000
1978	49532505	161910000	25529000	96048000
1979	50075934	164863000	25893000	98824000
1980	50654940	167745000	26428000	99303000
1981	51108712	170130000	26540000	100397000
1982	51369103	172271000	26399000	99526000
1983	51568772	174215000	26113000	100834000
1984	51707892	176383000	26276000	105005000
1985	51894038	178206000	26326000	107150000
1986	52122645	180587000	26650000	109597000
1987	52297283	182753000	26782000	112440000
1988	52591578	184613000	27087000	114968000
1989	53242628	186393000	27486000	117342000
1990	66815724	189164000	29033000	118793000
1991	67174772	190925000	37126000	117718000
1992	67732723	192805000	36617000	118492000
1993	68030392	194838000	36070000	120259000
1994	68244268	196814000	35765000	123060000
1995	68579014	198584000	35727000	124900000
1996	68824916	200591000	35634000	126708000
1997	68958968	203133000	35439000	129558000
1998	69056968	205220000	35498000	131463000
1999	69266461	207753000	36026000	133488000
2000	69482298	212577000	36232000	136891000
2001	69821465	215092000	36415000	136933000
2002	70121100	217570000	36118000	136485000
2003	70369561	221168000	35734000	137736000
2004	70576191	223357000	35209000	139252000
2005	70788123	226082000	36047000	141730000

Table A-1: Population above 16 and 15 years and Employment, United States and Germany, 1970-2005 (www.destatis.de and www.bls.gov)

[118] Most of the data was conducted in the first half of 2006.

	GERMAN CIVILIAN LABOR FORCE PARTICIPATION RATE	US CIVILIAN LABOR FORCE PARTICIPATION RATE
1970	57.1	60.4
1971	56.8	60.4
1972	56.7	60.2
1973	56.8	60.0
1974	56.4	61.3
1975	55.5	61.4
1976	55.1	61.3
1977	54.7	61.6
1978	54.7	62.8
1979	55.0	63.8
1980	55.2	64.0
1981	55.4	63.9
1982	55.7	63.7
1983	56.1	63.9
1984	56.6	63.9
1985	57.2	64.7
1986	57.6	64.9
1987	58.1	65.4
1988	58.6	65.8
1989	58.5	66.5
1990	47.6	66.8
1991	60.5	66.2
1992	59.6	66.3
1993	59.3	66.2
1994	59.3	66.6
1995	58.9	66.8
1996	58.9	66.4
1997	59.3	67.0
1998	59.6	67.1
1999	59.8	67.2
2000	60.3	67.3
2001	60.3	67.2
2002	60.2	66.5
2003	60.2	66.4
2004	60.5	66.1
2005	60.2	65.8

Table A-2: Civilian Labor Force Participation Rate, United States and Germany, 1970-2005 (www.bls.gov and www.destatis.de)

UNITED STATES (in 1,000s)				
YEAR	SELF-EMPLOYED	UNPAID FAMILY WORKERS	GOVERNMENT WAGE AND SALARY WORKERS	PRIVATE WAGE AND SALARY WORKERS
1970	5,221	502	12,431	57,059
1971	5,327	522	12,799	57,321
1972	5,365	519	13,393	59,393
1973	5,474	540	13,655	61,925
1974	5,697	489	14,124	62,970
1975	5,705	483	14,675	61,575
1976	5,783	464	15,132	64,044
1977	6,114	498	15,361	66,759
1978	6,429	479	15,525	70,228
1979	6,791	463	15,635	72,587
1980	7,000	413	15,912	72,612
1981	7,097	390	15,689	73,853
1982	7,262	401	15,516	72,945
1983	7,575	376	15,537	73,963
1984	7,785	335	15,770	77,794
1985	7,811	289	16,031	79,841
1986	7,881	255	16,342	81,957
1987	8,201	260	16,800	83,970
1988	8,519	260	17,114	85,907
1989	8,605	279	17,469	87,790
1990	8,719	253	17,769	88,829
1991	8,851	226	17,934	87,438
1992	8,575	233	18,136	88,301
1993	8,959	218	18,579	89,387
1994	9,003	131	18,293	92,224
1995	8,902	110	18,362	94,086
1996	8,971	122	18,217	95,954
1997	9,056	120	18,131	98,852
1998	8,962	103	18,383	100,637
1999	8,790	95	18,903	102,420
2000	9,205	108	19,248	105,866
2001	9,121	107	19,335	106,072
2002	8,923	95	19,636	105,521
2003	9,344	101	19,634	106,381
2004	9,467	90	19,983	107,480
2005	9,509	93	20,357	109,573

Table A-3: Employment According to Occupational Status, United States, 1970-2005 (www.bls.gov)

GERMANY (in 1,000s)					
YEAR	SELF-EMPLOYED	UNPAID FAMILY WORKERS	PUBLIC OFFICALS	EMPLOYEES	LABORERS
1970	2,765	1,790	1,423	7,693	12,279
1971	2,663	1,646	1,460	8,136	12,197
1972	2,550	1,483	2,070	8,591	12,168
1973	2,529	1,492	2,087	8,744	12,214
1974	2,445	1,410	2,118	8,863	12,017
1975	2,398	1,299	2,142	8,977	11,144
1976	2,331	1,188	2,211	9,058	10,965
1977	2,312	1,121	2,231	9,150	11,069
1978	2,291	1,050	2,268	9,396	11,016
1979	2,339	943	2,265	9,666	11,134
1980	2,316	924	2,261	10,002	11,372
1981	2,266	890	2,272	10,157	11,361
1982	2,324	818	2,323	10,250	11,059
1983	2,324	950	-	-	-
1984	2,430	896	-	-	-
1985	2,424	711	2,367	10,531	10,593
1986	2,404	717	2,379	10,840	10,600
1987	2,427	656	2,388	11,075	10,537
1988	2,422	639	2,370	11,515	10,419
1989	2,463	562	2,424	11,612	10,682
1990	2,580	578	2,486	12,716	10,975
1991	3,037	521	2,511	16,808	14,568
1992	3,091	529	2,492	16,861	13,968
1993	3,175	483	2,483	16,771	13,468
1994	3,288	487	2,471	16,846	12,982
1995	3,336	482	2,445	16,790	12,995
1996	3,408	385	2,461	16,752	12,975
1997	3,528	360	2,455	16,986	12,476
1998	3,594	388	2,406	17,172	12,300
1999	3,595	311	2,389	17,655	12,453
2000	3,643	323	2,315	17,645	12,678
2001	3,632	441	2,263	18,496	11,984
2002	3,654	414	2,225	18,669	11,576
2003	3,744	385	2,244	18,634	11,165
2004	3,852	402	2,243	18,016	11,147

Table A-4: Employment According to Occupational Status, Germany, 1970-2004 (www.destatis.de)

UNEMPLOYED (in 1,000s)		
YEAR	GERMANY	UNITED STATES
1970	160	4,093
1971	201	5,016
1972	197	4,882
1973	178	4,365
1974	373	5,156
1975	905	7,929
1976	941	7,406
1977	972	6,991
1978	931	6,202
1979	852	6,137
1980	766	7,637
1981	1,045	8,273
1982	1,560	10,678
1983	2,064	10,717
1984	2,207	8,539
1985	2,386	8,312
1986	2,290	8,237
1987	2,376	7,425
1988	2,314	6,701
1989	2,147	6,528
1990	1,968	7,047
1991	2,636	8,628
1992	3,181	9,613
1993	3,794	8,940
1994	4,155	7,996
1995	4,029	7,404
1996	3,995	7,236
1997	4,468	6,739
1998	4,396	6,210
1999	4,103	5,880
2000	3,722	5,692
2001	3,730	6,801
2002	4,064	8,378
2003	4,614	8,774
2004	4,941	8,149
2005	4,578	7,591

Table A-5: Total Unemployment, United States and Germany, 1970-2005 (www.bls.gov and www.destatis.de)

UNEMPLOYMENT RATE		
YEAR	GERMANY	UNITED STATES
1970	0.7%	4.9%
1971	0.8%	5.9%
1972	1.1%	5.6%
1973	1.2%	4.9%
1974	2.6%	5.6%
1975	4.7%	8.5%
1976	4.6%	7.7%
1977	4.5%	7.1%
1978	4.3%	6.1%
1979	3.8%	5.8%
1980	3.8%	7.1%
1981	5.5%	7.6%
1982	7.5%	9.7%
1983	9.1%	9.6%
1984	9.1%	7.5%
1985	9.3%	7.2%
1986	9.0%	7.0%
1987	8.9%	6.2%
1988	8.7%	5.5%
1989	7.9%	5.3%
1990	7.2%	5.6%
1991	7.3%	6.8%
1992	8.5%	7.5%
1993	9.8%	6.9%
1994	10.6%	6.1%
1995	10.4%	5.6%
1996	11.5%	5.4%
1997	12.7%	4.9%
1998	12.3%	4.5%
1999	11.7%	4.2%
2000	10.7%	4.0%
2001	10.4%	4.7%
2002	10.8%	5.8%
2003	11.6%	6.0%
2004	11.7%	5.5%
2005	13.0%	5.1%
2006	12.0%	4.6%

Table A-6: Unemployment Rate, United States and Germany, 1970-2006 (www.bls.gov and www.destatis.de)

UNITED STATES (in 1,000s)		
YEAR	EMPLOYED FULL-TIME	EMPLOYED PART-TIME
1970	66,753	11,925
1971	66,973	12,393
1972	69,214	12,939
1973	71,803	13,262
1974	73,093	13,701
1975	71,586	14,260
1976	73,964	14,788
1977	76,625	15,391
1978	80,193	15,855
1979	82,654	16,171
1980	82,562	16,740
1981	83,243	17,154
1982	81,421	18,106
1983	82,322	18,511
1984	86,544	18,462
1985	88,534	18,615
1986	90,529	19,069
1987	92,957	19,483
1988	95,214	19,754
1989	97,369	19,973
1990	98,666	20,128
1991	97,190	20,528
1992	97,664	20,828
1993	99,114	21,145
1994	99,772	23,288
1995	101,679	23,220
1996	103,537	23,170
1997	106,334	23,224
1998	108,202	23,261
1999	110,302	23,186
2000	113,846	23,044
2001	113,573	23,361
2002	112,700	23,785
2003	113,324	24,412
2004	114,518	24,734
2005	117,016	24,714

Table A-7: Comparison of Full-time and Part-time Employment, United States, 1970-2005 (www.bls.gov)

UNITED STATES		
YEAR	PERCENT FULL-TIME OF EMPLOYED	PERCENT PART-TIME OF EMPLOYED
1970	84.8%	15.2%
1971	84.4%	15.6%
1972	84.3%	15.7%
1973	84.4%	15.6%
1974	84.2%	15.8%
1975	83.4%	16.6%
1976	83.3%	16.7%
1977	83.3%	16.7%
1978	83.5%	16.5%
1979	83.6%	16.4%
1980	83.1%	16.9%
1981	82.9%	17.1%
1982	81.8%	18.2%
1983	81.6%	18.4%
1984	82.4%	17.6%
1985	82.6%	17.4%
1986	82.6%	17.4%
1987	82.7%	17.3%
1988	82.8%	17.2%
1989	83.0%	17.0%
1990	83.1%	16.9%
1991	82.6%	17.4%
1992	82.4%	17.6%
1993	82.4%	17.6%
1994	81.1%	18.9%
1995	81.4%	18.6%
1996	81.7%	18.3%
1997	82.1%	17.9%
1998	82.3%	17.7%
1999	82.6%	17.4%
2000	83.2%	16.8%
2001	82.9%	17.1%
2002	82.6%	17.4%
2003	82.3%	17.7%
2004	82.2%	17.8%
2005	82.6%	17.4%

Table A-8: Comparison of Full-time and Part-time Employment in Percent of Employed Persons, United States, 1970-2005 (www.bls.gov)

GERMANY (in 1,000s)						
YEAR	FULL-TIME MEN	FULL-TIME WOMEN	PART-TIME MEN	PART-TIME WOMEN	FULL-TIME TOTAL	PART-TIME TOTAL
1985	14,232	6,440	198	2,621	20,672	2,819
1986	14,391	6,511	206	2,711	20,902	2,917
1987	14,372	6,673	216	2,724	21,045	2,940
1988	14,565	6,634	247	2,859	21,199	3,106
1989	14,736	6,791	258	2,933	21,527	3,191
1990	15,205	7,036	338	3,596	22,241	3,934
1991	19,133	10,018	402	4,334	29,151	4,736
1992	18,810	9,747	423	4,340	28,557	4,763
1993	18,428	9,394	443	4,458	27,822	4,901
1994	17,952	9,226	520	4,601	27,178	5,121
1995	17,821	9,147	574	4,688	26,968	5,262
1996	17,522	9,326	612	4,728	26,848	5,340
1997	17,199	9,058	701	4,958	26,257	5,659
1998	17,046	8,948	765	5,119	25,994	5,884
1999	17,149	9,024	831	5,492	26,173	6,323
2000	17,104	9,056	865	5,613	26,160	6,478
2001	16,985	8,961	925	5,873	25,946	6,798
2002	16,651	8,884	964	5,970	25,535	6,934
2003	16,188	8,687	1,037	6,131	24,875	7,168
2004	15,803	8,434	1,043	6,125	24,237	7,168

Table A-9: Gender-specific Full-time and Part-time Employment, Germany, 1985-2004 (www.destatis.de)

GERMANY			
YEAR	PART-TIME IN PERCENT FULL-TIME MEN	PART-TIME IN PERCENT FULL-TIME WOMEN	PART-TIME TOTAL
1985	1.4%	40.7%	13.6%
1986	1.4%	41.6%	14.0%
1987	1.5%	40.8%	14.0%
1988	1.7%	43.1%	14.7%
1989	1.8%	43.2%	14.8%
1990	2.2%	51.1%	17.7%
1991	2.1%	43.3%	16.2%
1992	2.2%	44.5%	16.7%
1993	2.4%	47.5%	17.6%
1994	2.9%	49.9%	18.8%
1995	3.2%	51.3%	19.5%
1996	3.5%	50.7%	19.9%
1997	4.1%	54.7%	21.6%
1998	4.5%	57.2%	22.6%
1999	4.8%	60.9%	24.2%
2000	5.1%	62.0%	24.8%
2001	5.4%	65.5%	26.2%
2002	5.8%	67.2%	27.2%
2003	6.4%	70.6%	28.8%
2004	6.6%	72.6%	29.6%

Table A-10: Ratio of Gender-specific Part-time Employment to Full-time Employment, Germany, 1985-2004 (www.destatis.de)

	UNITED STATES		GERMANY	
	2004	2005	2004	2005
PCs	80%	84%	39%	43%
Internet Users	65%	65%	54%	54%
Mobile Phones	61%	71%	87%	95%
ISDN Ducts	5%	-	33%	-
DSL Connections	11%	16%	17%	26%

Table A-11: Indicators of the Information Society for the United States and Germany, (2004: Institut der deutschen Wirtschaft Köln 2005, 152f.; 2005: BITKOM 2006a, 5)

		UNITED STATES	GERMANY
Investment in Knowledge	(2000, in % from GDP)	6.8%	4.7%
R&D Spendings	(2003, in % from GDP)	2.6%	2.5%
Researchers	(1999, 2002, per 1000 employees)	8.6	6.9
Traidepatents	(2002, per 1 Mio employees)	239	277

Table A-12: Indicators of the Knowledge Society for the United States and Germany, (Institut der deutschen Wirtschaft Köln 2005, 152f.)

COPUTER RELATED OCCUPATIONS - UNITED STATES (in 1,000s)		
YEAR	TOTAL LABOR FORCE	EMPLOYED
2000	3,226	3,163
2001	3,223	3,127
2002	3,122	2,949
2003	3,074	2,902
2004	2,954	2,815
2005	3,136	3,021

Table A-13: Total Labor Force and Employed in Computer-related Occupations, United States, 2000-2005 (Allegretto 2005, 3)

Appendix B

Detailed Description of Interviewees

In the following I am presenting a detailed overview of the individuals whom I interviewed. Throughout the study direct quotes have been cited when their statements enrich the analysis. I start out with my American interviewees.[119]

The individual who had the most experience I will call George. He is 82 years old, married, has two children, and still works as a software developer. When I asked George why he did not retire instead of starting his job at US Stat Corp about six years ago, his reaction was: "I don't work full time. I work around 80 per cent. Work is something I enjoy very much." He and his wife (who still works part time as a teachers' aid at a high school) live in a assisted living retirement village associated with the university. George graduated from Yale University in mathematics and theoretical physics (as he puts it: "Of course at that time it was no such thing as computer science."). Before finishing his studies – which he interrupted during World War II – he was involved in electrical engineering for a short period at the Los Alamos Laboratory in New Mexico as part of the Manhattan Project to develop the atomic bomb. In 1948, he started working as a software developer and has worked in this field ever since. After finishing his studies at Yale in 1948, he worked for a company for six years in Virginia. There he started working with computers. Because the company moved, he and three of his coworkers started their own business in Virginia, doing basically the same work that they had done in the company. After about four or five years for a brief time George started working for a government agency that had been a customer. During the late 1960s and early 1970s he moved to Florida to start working at a company there. He stayed there until it was time to retire and moved back to where he came from in the northeast United States. In 1999, he still did some work for his former employer in Florida and about six years ago he started to work at US Stat Corp. His career path can thus be described as rather stable. He collected some experience at different companies in the beginning of his career and then stayed at one company for the biggest portion of

[119] It goes without saying that I changed the names of those whom I interviewed. Taking into account the customs of each country, the US interviewees are referred to by their first name. Even though it is rather common to address one's coworkers informally in the field of information and communication technology and among software developers in Germany, I refer to those interviewed in Germany by their last name. With all but one of the interview partners I used the formal form of address during the interview.

his working life. It is unusual, especially from a German point of view, that George is still working at the age of 82.[120]

My next interviewee is 31 years old and also works at US Stat Corp. I will call him Jim. He received a bachelor's degree in software engineering and started working at US Stat Corp right after finishing his studies. He told me that he was the 44th employee at the company when he started. Since then, the company has grown to more than 200 employees. At first he worked in the areas of quality assurance. Then he moved up within the company. Now he works as a software developer. In his first position he was mainly responsible for testing the newly developed programs. The promotion a few years later led to the fact that he "actually does the job" now. Jim lives in a small town where he grew up, about 25 miles from his workplace. His career is also a relatively stable one in the software developing field, because he has stayed in the same occupation and therefore does not belong to the group of career changers. In addition, he did not change companies since the beginning of his career.

Susan is a 44-year-old woman who works for US Trad Corp. She is one of the "career changers" in the software industry. Until she was 30 years old she worked in the retail industry. She has a bachelor's degree in fashion merchandising and textile marketing. Interestingly, her decision to change fields was based on the overwhelming working hours and highly variable work schedule. She preferred a 9-to-5 job. This is interesting because the software industry seems to be one in which it is rather hard to find a 9-to-5 job. Susan had jobs at several small start-up companies at the beginning of her career, and as it turns out, Susan did not have a 9-to-5 job when she began working as a software administrator. Her work schedule there was also highly flexible. However, it was not as onerous as her previous career because, as she explained, they sometimes "played hooky" when the weather was nice outside. Or, when the weather was bad and she did not feel like getting up, she would come in the office later and work longer in the evenings. But still it was not a 9-to-5 job. Now, however, working for US Trad Corp, her work schedule is more rigid, and if she takes time off she has to charge the hours against her annual allotted leave time – she cannot make up the time anymore. Susan likes having evenings, weekends, and holidays off, and she tries really hard not to work overtime. She does not take work home with her. Only if there is an emergency, then her coworkers can contact her any time. Susan works as the system administrator

[120] Usually, Germans retire at the age of 65.

of the software developing group at US Stat Corp. However, a central component of her work is programming in addition to her regular tasks as a system administrator.

The next interviewee from US Trad Corp I will call Vivek. He is from India, is 29 years old, and completed his bachelor's degree in electronic engineering in India. Then he worked there as a software developer for two years before moving to the United States. He got his master's degree from the University of Illinois in computer science, during which time he worked on IBM technology on the "Year 2000" problem. After finishing his master's work, he started consulting on Java programming. He began working for US Trad Corp five years ago and recently was promoted to be the team leader for the software developing group. Vivek is married, and he and his wife have a dog. They live in the same town where US Trad Corp is located. His wife works as a software tester at a software company on the other side of town. Vivek represents young professionals from foreign countries who have a very good education and are motivated to gain experience in the United States and at some point plan to bring their experience back with them to their home country.

Tom is 53 years old and has worked for US Trad Corp for 26 years. Within the company he has had seven or eight careers. He is an electrical engineer and came to the software developing group because he knows the hardware products of the company very well due to his long employment at the company. He leads the deployment group. He reports directly to the vice president of services and solutions. His wife is a teacher in town and he has two sons who are 14 and 18 years old. Tom represents the experienced employee with a stable career, given his tenure at his company, but with several career changes within that company. Even though Tom is not a software developer, he is very much involved in the work of the software developing group of his company.[121]

Now I turn to my German interviewees.

Herr Maier works as senior consultant at German Soft Corp in the field of application management and support of regular customers. He epitomizes the modern employee, especially the modern employee in the ICT field. He is 40 years old now and his professional career is rather colorful. He studied computer science at the university of applied science. Even though applied universities are supposed to be oriented towards the industry, Herr Maier found his studies still very theoretically oriented, and

[121] To keep it simple, I will still refer to him as on of the software developers I interviewed.

he was glad about the opportunity to work in his field at a company while he was studying at the university. He learned a lot of what he needed in his professional life there. Later he started working full-time at the company where he had worked as a student. From the beginning he was very interested in the exchange between science and practice. Then he started his own business with one of his co-workers in the field of ICT training. Because of controversies with his partner and because he did not like the teaching very much, he started to work for a company again as an organizational software developer. Later his job was called system analyst. Even though his job title changed, the actual tasks did not change very much. But the job title had influence on his position within the hierarchy of the company. From the beginning he planned to stay for only about eight years in the company, because he considered it important to change positions regularly. After seven years he got a good offer from a consulting company and began working there. This company grew from about 600 to almost 2000 employees within a very short time and there were takeovers from other companies. With these takeovers the corporate philosophy changed and Herr Maier was moved to a different department. Because they did not discuss this change with him and he did not like being dealt with in this way, he left the company after two and a half years. He started working at a bigger company, which he left after a short period because its software developing program did not get started. Then he began working at a small consulting company. Shortly before it filed for bankruptcy he left the company. Since 2004 he has worked at German Soft Corp. The main field of his work is software migration, which has been his focus for about ten years. He also works with application management and assists regular customers. Herr Maier fits into the category of a highly flexible software developer. He has changed positions frequently during his career. His self-concept is that of a flexible and open-minded employee.

My next interviewee, Herr Pfeiffer, is 32 years old and has a degree as a banker from apprenticeship training. He worked as a banker for six and a half years and switched to German Soft Corp five years ago. He has a wife and no children. He lives in the countryside and his commute to work takes between 35 and 60 minutes, depending on traffic. He started at the German Soft Corp without extensive knowledge of IT and was trained for about eight weeks before he started to work for customers. The programming part of his work is limited. His work mainly concerns product implementation and application support. His job involves a high amount of information processing. Since he has worked for the German Soft Corp he has had various different

customers and tasks. During the first two years he traveled almost constantly. Since then his traveling time has decreased to about 30 percent. For about a year he has been a team leader and has mostly coordinative tasks. Herr Pfeiffer is a classical career changer.

Herr Lang from German Soft Corp is 35 years old and studied computer science management at a university of cooperative education (German: “Berufsakademie”). This is even more practice oriented than an university of applied science. Students usually have modules of three months alternating between university and company. Before his studies he gained professional experience at the information and communication department at a city council. There he basically learned on the job and through the experience of his coworkers. Self-study played an important role as well. He already worked at German Soft Corp when he was a student. His title was junior employee and he was fully integrated in the work process. The customers did not know that he was still a student. After finishing his studies he took over a large project. He moved from project to project, having more responsibility for coordinating the tasks involved. At the end he was responsible for 40 employees. A few years ago he changed to a different company and had various different projects there. He worked there about one year and then left because of discrepancies within the company. But his new job also did not work out, and he subsequently began working for German Soft Corp again. Currently, he works as a freelancer for the German Soft Corp because they cannot hire staff at the moment due to a company reorganization. He aims at an employment contract, though. He enjoys his work a lot and compliments his employer on the working conditions provided. Herr Lang says that because he saw how the management at other companies treats the employees, he appreciates the way the employees at German Soft Corp are looked for. Because of reorganization there is some danger that this philosophy might change. But he still thinks of German Soft Corp as a good employer for himself, noting that because it is a big company, there is always a possibility to start a totally new job. That option is important to him. Currently he is senior consultant. If he would be employed permanently his title would change to “Platinum Consultant.” Herr Lang is the only freelancer in the sample. His career has been highly flexible so far.

Herr Roth started to work at German Soft Corp as a senior consultant two years ago. He studied business economics at the university of applied science, and had only a few classes in computer science. So his job as software developer is in a field that is

different from his theoretical background. His business economics background is helpful, though, because he specializes in business applications. Most of his technical knowledge he learned by doing. In addition, when he was a student he worked in the software developing and support field at a company and also wrote his thesis within the company. After a while he was self-employed for a year, but because of differences with his business partner he started working at a consulting company. Because he disliked the amount of travel required in that job he changed to German Soft Corp. Herr Roth is 35 years old and single. His former partnership with a woman failed because of the high amount of work and traveling. His career has been rather flexible so far. He represents those IT workers with a different theoretical background who learned almost all their IT knowledge on the job.

Frau Schmidt is a team leader at German Dev Corp with supervisory responsibility of 10 software developers. Frau Schmidt is 40 years old, married without children, and lives about 60 kilometers away from her work place. So she has to commute relatively far. She works for German Dev Corp since fourteen years. She started as a software developer and has changed projects within the company about every one and a half years. During her career she has gained experience in and knowledge about technology more and more. She studied computer science. Most of her colleagues from the university moved into different directions, such as applications, customer relations or consulting. She, instead, got into the technology deeper and deeper. She has been is in the position of a team leader for six years. This role constantly leaves her with less time to actually do the work with the technology. Today, she rarely works on software developing, but follows up on the work of others within her work group. She did not plan to stay at German Dev Corp this long, originally just planning on two or three years before changing to somewhere where she would not have to commute so far. Her husband is self-employed and leaves for work earlier and comes home earlier than she does. Their free time is pretty much limited to the weekend, although even then they are often too tired from work to meet with friends and do enough sports. All in all, Frau Schmidt’s career at German Dev Corp developed pretty much accidentially, without a plan. She represents the few female software developers with positions of leadership and supervisory responsibility in Germany.

At German Dev Corp I interviewed another female team leader in the product development section. I call her Frau Müller. She is 42 years old, married without children. After high school she attended an apprenticeship training program as a

technical assistant. After working in her occupation for about one and a half years she decided to study computer science. During that time she was a working student in the company she worked for before starting her computer science studies. After finishing her degree Frau Müller started at German Dev Corp, 14 years ago. She changed fields of her work regularly (about every three years, sometimes more quickly) and moved up to be a team leader about five years ago. While she was in this team leader position, the team and its responsibilities changed fundamentally at least twice due to organizational restructuring. She describes her position as a cross-sectional function. Her field of responsibilities broadened over time. At first her team consisted of eight employees who worked on site. Today there are ten employees working on site, and seven more people working in offshore regions. Before she became a team leader she was released from her tasks to be a member of the works' council holding the position of associate shop chairwomen (German: "stellvertretende Betriebsratsvorsitzende"). Even though she was member of the works' council she was not a union member. She shares an office with her deputy and says that this helps to easily exchange information. Frau Müller's career history is exceptional for two reasons: She is a female team leader and she was an associate shop chairwoman in a software company. Even though her tasks and positions changed regularly, concerning the company tenure her career can be judged as being rather stable.

Herr Klein has worked at German Dev Corp for 15 years. Originally he studied electrical engineering, but there he failed and therefore completed an apprenticeship training as an electrician. Because of the missing professional prospect he started to study computer science and completed his studies. He already worked at German Dev Corp as a student and wrote his thesis there. He was able to use what he constructed in his thesis and build it into a product of the company. He changed positions several times within the company, each time becoming involved more deeply in technology. Currently, he is senior developer. He does not have management responsibilities. He has a daughter who is eight and a son who is 12. His wife is a housewife. She would like to work part-time but has not found a job in her field because very few part-time positions are offered.

References

Achatz, Juliane; Allmendinger, Jutta; Dressel, Kathrin and Kleinert, Corinna (2006): *Mütter sitzen selten im Chefsessel. Frauen haben noch immer kaum Chancen auf Spitzenpositionen.* Frankfurter Rundschau. Frankfurt. 7.

AFL-CIO (2004): *Outsourcing America (Resolution of the Executive Council from March 11, 2004).* AFL-CIO. Access date: 06/04/28.

AFL-CIO (2006): *Trends in Union Membership.* AFL-CIO. http://www.aflcio.org/joinaunion/why/uniondifference/uniondiff11.cfm. Access date: 05/24/2006.

Aglietta, Michel (2001 [1979]): *A Theory of Capitalist Regulation. The US Experience.* Reprint (French Original [1976]: Régulation et crises du cápitalisme). London: New Left Book.

Allegretto, Sylvia A. (with research assistance by David Ratner and Yulia Fungard) (2005): *The aftermath of the tech bubble.* Economic Policy Institute - Job Watch. http://www.jobwatch.org/email/jobwatch_20050805.html. Access date: 11/29/2005.

Allen, Thomas J. and Gerstenberger, Peter G. (1973): *A Field Experiment to Improve Communication in a Product Engineering Department: The Nonterritorial Office.* In: Human Factors. 15. 5. 487-498.

Allmendinger, Jutta; Eichhorst, Werner and Walwei, Ulrich (Ed.) (2005): *IAB Handbuch Arbeitsmarkt. Analysen, Daten, Fakten.* Frankfurt, New York: Campus Verlag.

Allmendinger, Jutta and Hinz, Thomas (2002): *Perspektiven der Organisationssoziologie.* In: Allmendinger, Jutta and Hinz, Thomas (Ed.). Kölner Zeitschrift für Soziologie und Sozialpsychologie. Sonderhefte. Organisationssoziologie. Wiesbaden: Westdeutscher Verlag. 9-28.

Altvater, Elmar and Mahnkopf, Birgit (2002): *Globalisierung und Unsicherheit. Arbeit im Schatten, schmutziges Geld und informelle Politik.* Münster: Dampfboot Verlag.

Anger, Silke (2006): *Zur Vergütung von Überstunden in Deutschland: unbezahlte Mehrarbeit auf dem Vormarsch.* In: Wochenbericht des DIW Berlin. 15/16. 189-196.

Arthur, Michael B.; Hall, Douglas T. and Lawrence, Barbara S. (1989): *The Handbook of Career Theory.* Cambridge, New York: Cambridge University Press.

Arthur, Michael B. and Rousseau, Denise M. (1996): *The Boundaryless Career.* New York: Oxford University Press.

Autor, David (2000a): *Outsourcing At Will: Unjust Dismissal Doctrine and the Growth of Temporary Help Employment.* In: National Bureau of Economic Research. Working Paper 7557. February. 1-26.

Autor, David (2000b): *Why Do Temporary Help Firms Provide Free General Skill Training?* In: National Bureau of Economic Research. Working Paper 7637. April. 1-45.

Bach, Hans-Uwe and Koch, Susanne (2003): *IAB Labour Market Research Topics No. 53. Working Time and the Volume of Work in Germany - The IAB Concept of Measurement* -. Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit (IAB). Nürnberg.

Batt, Rosemary; Christopherson, Susan; Rightor, Ned and Jaarsveld, Danielle van (2001): *NET WORKING. Work Patterns and Workforce Policies for the New Media Industry.* In: Economic Policy Institute. 1-57.

Becker, Franklin and Sims, William (2001): *Offices That Work. Balancing Commuication, Flexibility and Cost.* Cornell University. International Workplace Studies Program. http://iwsp.human.cornelI.edu. Access date: 04/02/2006.

Beckmann, Michael (2000): *Unternehmenspolitik, Managerkontrolle und Personalabbau in Deutschland. Theoretische Ansätze und empirische Analyse mit Daten des IAB-Betriebspanels.* In: MittAB. 4/2000. 594-608.

Bednarzik, Robert W. (2005): *Restructuring Information Technology: Is Offshoring a Concern?* In: Monthly Labor Review. August 2005. 11-21.

Beise, Marc (2006): *Wenn ein Betriebsrat droht.* Süddeutsche Zeitung. München. 03/07/2006. 17.

Bell, Daniel (1976 [1973]): *The Coming of Post-Industrial Society.* New York: Basic Books.

Bell, Daniel (1980): *The Social Framework of the Information Society.* In: Forester, Tom (Ed.). The Microelectronics Revolution. Oxford: 500-549.

Beniger, James R. (1986): *The Control Revolution. Technological and Economic Origins of the Information Society.* Cambridge, Massachusetts, London: Harvard University Press.

Benner, Chris (2002): *Work in the New Economy. Flexible Labor Markets in Silicon Valley.* Cornwall: Blackwell Publishing.

Benner, Chris (2003): *"Computers in the Wild": Guilds and Next-Generation Unionism in the Information Revolution.* In: International Review of Social History. Uncovering Labour in Information Revolutions, 1750-2000. Volume 48. Supplement 11. 181-204.

Benner, Chris (2006): *'South Africa On-Call': Information Technology and Labour Market Restructuring in South African Call Centres.* In: Regional Studies. 40. 9. 1025-1040.

Benner, Chris and Dean, Amy (2000): *Labor in the New Economy: Lessons from Labor Organizing in Silicon Valley.* In: Carre, Francoise; Ferber, Marianne; Golden, Lonnie and Herzenberg, Steve (Ed.). Nonstandard Work Arrangements and the Changing Labor Markets: Dimensions, Causes, and Institutional Responses. Institutional Relations Research Association 2000 Annual Research Volume. 361-375.

Bernstein, Jared (2004): *The Changing Nature of the Economy. The Critical Role of Education and Innovation in Creating Jobs and Opportunity in a Knowledge Economy.* Economic Policy Institute (EPI). http://www.epinet.org/content.cfm?id=1749. Access date: 02/09/2006.

Bernstein, Jared; McNichol, Elizabeth and Lyons, Karen (2006): *Pulling Apart. A State-by-State Analysis of Income Trends.* Economic Policy Institute. Center on Budget and Policy Priorities. http://www.epinet.org/studies/pulling06/pulling_apart_2006.pdf. Access date: 02/09/2006.

Bertschek, Irene and Kaiser, Ulrich (2002): *IKT-Einsatz, Arbeitsplatzreorganisation und Produktivität: Empirische Evidenz für unternehmensnahe Dienstleister.* In: BeitrAB. 257. 85-97.

Bertschek, Irene and Spitz, Alexandra (2003): *IT, Organizational Change and Wages.* Zentrum für Europäische Wirtschaftsforschung GmbH (ZEW). Mannheim.

Bispinck, Reinhard (2003a): *Das deutsche Tarifsystem in Zeiten der Krise - Streit um Flächentarif, Differenzierung und Mindeststandards.* In: WSI Mitteilungen. 7/2003. 395-404.

Bispinck, Reinhard (2003b): *Flächentarifvertrag - Mindeststandards - Niedrigeinkommen.* In: WSI Mitteilungen. 7/2003. 294.

BITKOM (2006a): *Daten zur Informationsgesellschaft. Status quo und Perspektiven Deutschlands im internationalen Vergleich.* Berlin: BITKOM.

BITKOM (2006b): *Kennzahlen zur ITK-Branchenentwicklung. Frühjahr 2006.* BITKOM. www.bitkom.org. Access date: 04/05/2006.

Bleicher, André; Fischer, Joachim; Gensior, Sabine and Steiner, Ronald (2002): *Auswirkungen von Outsourcing auf Beschäftigung und Arbeitsbeziehungen.* In: WSI Mitteilungen. 7/2002. 403-409.

BMWA (2005): *Kabinett stimmt Erleichterung befristeter Beschäftigung und Fortführung arbeitsmarktpolitischer Instrumente zu.* BMWA-Pressemitteilung. 04/20/2005. Berlin.

Boes, Andreas (2005a): *Auf dem Weg in die Sackgasse? Internationalisierung im Feld Software und IT-Services.* In: Boes, Andreas and Schwemmle, Michael (Ed.). Bangalore statt Böblingen? Offshoring und Internationalisierung im IT-Sektor. Hamburg: VSA-Verlag. 13-65.

Boes, Andreas (2005b): *Informatisierung.* In: Soziologisches Forschungsinstitut (SOFI); Institut für Arbeitsmarkt- und Berufsforschung (IAB); Institut für sozialwissenschaftliche Forschung (ISF) and Internationales Institut für empirische Sozialökonomie (INIFES) (Ed.). Berichterstattung zur sozio-ökonomischen Entwicklung in Deutschland - Arbeit und Lebensweisen. Erster Bericht. Wiesbaden: VS Verlag. 211-244.

Boes, Andreas and Baukrowitz, Andrea (2002): *Arbeitsbeziehungen in der IT-Industrie. Erosion oder Innovation der Mitbestimmung?* Berlin: Edition Sigma.

Boes, Andreas; Baukrowitz, Andrea and Eckhardt, Bernd (1995): *Herausforderung "Informationsgesellschaft". Die Aus- und Weiterbildung von IT-Fachkräften vor einer konzeptionellen Neuorientierung.* In: MittAB. 2/95. 239-251.

Boes, Andreas; Kämpf, Tobias and Marrs, Kira (2006): *Zukunft der Arbeitsbeziehungen: Zwischen Atomisierung und neuer Solidarität.* In: WSI Mitteilungen. 59. 2. 98-103.

Boes, Andreas and Schwemmle, Michael (2005): *Was ist Offshoring?* In: Boes, Andreas and Schwemmle, Michael (Ed.). Bangalore statt Böblingen? Offshoring und Internationalisierung im IT-Sektor. Hamburg: VSA-Verlag. 9-12.

Boes, Andreas and Trinks, Katrin (2006): *"Theoretisch bin ich frei!" Interessenhandeln und Mitbestimmung in der IT-Industrie.* Berlin: Edition Sigma.

Böhm, Sabine; Herrmann, Christa and Trinczek, Rainer (2004): *Herausforderung Vertrauensarbeitszeit. Zur Kultur und Praxis eines neuen Arbeitszeitmodells.* Berlin: Edition Sigma.

Boltanski, Luc and Chiapello, Ève (2003): *Der neue Geist des Kapitalismus.* Konstanz: UVK Verlagsgesellschaft.

Braverman, Harry (1974): *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century.* New York: Monthly Review Press.

Brennan, Aoife; Chugh, Jasdeep F. and Kline, Theresa (2002): *Traditional versus Open Office Design. A Longitudinal Field Study.* In: Environment and Behavior. 34. 3. 279-299.

Brinkmann, Christian; Deeke, Axel and Völkel, Brigitte (Ed.) (1995): *Experteninterviews in der Arbeitsmarktforschung - Diskussionsbeiträge zu methodischen Fragen und praktischen Erfahrungen.* Nürnberg: IAB.

Brodsky, Melvin M. (1994): *Labor market flexibility: A changing international perspective.* In: Monthly Labor Review. 117. 11. 53-60.

Broschak, Joseph P. and Davis-Blake, Alison (2006): *Mixing Standard Work and Nonstandard Deals: The Consequences of Heterogeneity in Employment Arrangements.* In: Academy of Management Journal. 49. 2. 371-393.

Brown, Sharon P. and Siegel, Lewis B. (2005): *Mass Layoff Data Indicate Outsourcing and Offshoring Work.* In: Monthly Labor Review. August 2005. 3-10.

Bullinger, Hans-Jörg; Bauer, Wilhelm; Kern, Peter and Zinser, Stephan (2000): *Zukunftsoffensive OFFICE 21. Büroarbeit in der dotcom-Gesellschaft gestalten.* Köln: Vgs Verlagsgesellschaft.

Bundesregierung (2006): *Die Wirksamkeit moderner Dienstleistungen am Arbeitsmarkt. Bericht 2005 der Bundesregierung zur Wirkung der Umsetzung der Vorschläge der Komission "Moderne Dienstleistungen am Arbeitsmarkt" (Ohne Grundsicherung für Arbeitssuchende).* Bundesregierung. Januar 2006. Berlin.

Burawoy, Michael (1982): *Manufacturing Consent: Changes in the Labour Process under Monopoly Capitalism.* Chicago: University of Chicago Press.

Buttler, Friedrich (Ed.) (1995): *Institutional frameworks and labor market performance. Comparative views on the U. S. and German economies.* London: Routledge.

Cappelli, Peter (2001): *Assessing the Decline of Internal Labor Markets.* In: Berg, Ivar and Kalleberg, Arne (Ed.). Sourcebook of Labor Markets: Evolving Structures and Processes. New York: Kluwer.

Cappelli, Peter and Carter, William (2000): *Computers, Work Organization, and Wage Outcomes.* http://papers.nber.org/papers/W7987. Access date: 02/05/2006.

Carnoy, Martin (2002): *Sustaining the New Economy. Work, Family, and Community in the Information Age.* 2. Cambridge, Massachusetts, London, England: Harvard University Press.

Caspar, Jürgen; Krömmelbein, Silvia and Schmid, Alfons (2001): *Neue Kommunikationstechnologien und Flexibilisierung der Arbeitsverhältnisse.* In: Esser, Josef and Schamp, Eike W. (Ed.). Metropolitane Region in der

Vernetzung. Der Fall Frankfurt/Rhein-Main. Frankfurt, New York: Campus Verlag. 75-102.

Castells, Manuel (1996): *The Rise of the Network Society.* Cambridge, Massachusetts: Blackwell Publishers.

Chan, Michael (1997): *Teleworking for Information Technology Professionals. An Empirical Study (unpublished).* Department of Information Systems. London School of Economics and Political Science. Universtity of London.

Dahrendorf, Ralf (1983): *Wenn der Arbeitsgesellschaft die Arbeit ausgeht.* In: Matthes, Joachim (Ed.). Krise der Arbeitsgesellschaft? Verhandlungen des 21. Deutschen Soziologentages in Bamberg 1982. Frankfurt: Campus Verlag. 25-37.

Deutscher Gewerkschaftsbund (DGB) (2005): *Mitglieder in den DGB-Gewerkschaften.* DGB. http://www.dgb.de/dgb/mitgliederzahlen/mitglieder.htm. Access date: 04/03/06.

Deutscher Gewerkschaftsbund (DGB) (2006): *Arbeitsbedingte Gesundheitsrisiken und demografischer Wandel. Herausforderungen für betriebliche Personal- und Gesundheitspolitik.* Deutscher Gewerkschaftsbund (DGB). Berlin.

Deutsches Jugendinstitut e. V. (in Zusammenarbeit mit dem Statistischen Bundesamt) (2005): *Gender-Datenreport. 1. Datenreport zur Gleichstellung von Frauen und Männern in der Bundesrepublik Deutschland.* Internetredaktion des BMFSFJ. http://www.bmfsfj.de/Publikationen/genderreport/3-erwerbseinkommen-von-frauen-und-maennern.html. Access date: 06/08/01.

DiPrete, Thomas A. (1993): *Industrial Restructuring and the Mobility Response of American Workers in the 1980s.* In: American Sociological Review. 58. 74-96.

Doeringer, Peter B. and Piore, Michael J. (1971): *Internal Labor Markets and Manpower Analysis.* Lexington, Massachusetts: Heath.

Donges, Juergen B. (2002): *Deregulierung von Märkten, globaler Wettbewerb und neue Ökonomie.* Paderborn, München: Ferdinand Schöningh.

Dose, Carsten (2006): *Flexible Bürokratie. Zur Logik aktueller Rationalisierungstendenzen bei Finanzdienstleistern.* Wiesbaden: Deutscher Universitätsverlag.

Dostal, Werner (1995): *Die Informatisierung der Arbeitswelt - Multimedia, offene Arbeitsformen und Telearbeit.* In: MittAB. 4/95. 527-543.

Dostal, Werner (1999): *Telearbeit in der Informationsgesellschaft. Zur Realisierung offener Arbeitsstrukturen in Betrieb und Gesellschaft.* Göttingen: Verlag für angewandte Psychologie.

Dostal, Werner (2004): *IT-Beschäftigung: Stagnation.* In: Informatik Spektrum. 27. 5. 433-440.

Dostal, Werner (2006): *IT-Beschäftigung als Frühindikator neuer Arbeitsformen?* In: Baukrowitz, Andrea; Berker, Thomas; Boes, Andreas; Pfeiffer, Sabine; Schmiede, Rudi and Will, Mascha (Ed.). Informatisierung der Arbeit - Gesellschaft im Umbruch. Berlin: Edition Sigma. 204-222.

Eberling, Matthias (1998): *Soziale und ökologische Folgen der Arbeitszeitflexibilisierung.* http://www.hbs-hessen.de/pol/eber.htm. Access date: 07/16/2003.

Eberling, Matthias and Henckel, Dietrich (2001): *Kommunale Zeitpolitik.* Berlin: Edition Sigma.

Ehrenreich, Barbara (2001): *Arbeit poor. Unterwegs in der Dienstleistungsgesellschaft.* München: Verlag Antje Kundstmann GmbH. Engl. Orig.: Nickel and Dimed. On (not) getting by in America. Metropolitan Books. New York.

Eisele, Johann (2005): *Entwicklung der Typologien.* In: Eisele, Johann and Staniek, Bettina (Ed.). BürobauAtlas: Grundlagen, Planung, Technologie, Arbeitsplatzqualitäten. München: Callwey Verlag. 42-53.

Endruweit, Günter and Trommersdorff, Gisela (Ed.) (2002): *Wörterbuch der Soziologie.* Stuttgart: Lucius & Lucius.

Erlinghagen, Marcel (2002): *Die Entwicklung von Arbeitsmarktmobilität und Beschäftigungsstabilität im Übergang von der Industrie- zur Dienstleistungsgesellschaft. Eine deskriptive Analyse des westdeutschen Arbeitsmarktes zwischen 1976 und 1995 auf Basis der IAB-Beschäftigtenstichprobe.* In: MittAB. 1/2002. 74-89.

Erlinghagen, Marcel and Knuth, Matthias (2002): *Kein Turbo-Arbeitsmarkt in Sicht. Fluktuation stagniert - Beschäftigungsstabilität nimmt zu.* In: IAT-Report. 04. 1-9.

Erlinghagen, Marcel and Knuth, Matthias (2003): *Arbeitsmarktdynamik zwischen öffentlicher Wahrnehmung und empirischer Realität.* In: WSI Mitteilungen. 8/2003. 503-509.

European Foundation for the Improvement of the Living and Working Conditions (2005): *Information Technology: Use and Training in Europe.* Dublin, Ireland.

Fischer, Lorenz and Wiswede, Günter (1997): *Grundlagen der Sozialpsychologie.* München, Wien: R. Oldenbourg Verlag.

Franco, Ana and Winqvist, Karin (2002): *Am Rande des Arbeitsmarkts? Befristete Beschäftigung in der EU.* Eurostat. http://www.eds-destatis.de/de/downloads/sif/nk_02_13.pdf. Access date: 05/02/2006.

Frankfurter Rundschau (2006): *Betriebsrat bei SAP gewählt. Gewerkschaftsnahe Liste landet abgeschlagen auf Rang drei.* Frankfurter Rundschau. Frankfurt. 06/23/06. 10.

Fraunhofer Institut für Systemtechnik und Innovationsforschung (Ed.) (1998): *Delphi '98: Studie zur globalen Entwicklung von Wissenschaft und Technik. Zusammenfassung der Ergebnisse.* Karlsruhe: Fraunhofer ISI.

Frazis, Harley and Stewart, Jay (2004): *What can time-use data tell us about hours of work?* In: Monthly Labor Review. 127. 12. 3-9.

Fuchs-Heinritz, Werner; Lautmann, Rüdiger; Rammstedt, Otthein and Wienhold, Hanns (Ed.) (1994): *Lexikon zur Soziologie.* 3. völlig neu bearbeitete und erweiterte Auflage. Wiesbaden: Westdeutscher Verlag.

Gamm, Gerhard (2000): *Nicht nichts. Studien zu einer Semantik des Unbestimmten.* Frankfurt am Main: Suhrkamp Verlag.

Gamm, Gerhard and Hetzel, Andreas (Ed.) (2005): *Unbestimmtheitssignaturen der Technik. Eine neue Deutung der technisierten Welt.* Bielefeld: Transcript Verlag.

Gangl, Markus (2005): *Wohlfahrtsregime, Einkommensungleichheit und Einkommensdynamik. Europa und die USA im Vergleich.* In: Kaelble, Hartmut and Schmid, Günther. (Ed.). Das europäische Sozialmodell. Auf dem Weg zum transnationalen Sozialstaat (WZB Jahrbuch 2004). Berlin: Edition Sigma. 239-260.

Gerlmaier, Anja (2002): *Neue Selbstständigkeit in der Informationsgesellschaft.* Dissertation. Dortmund: Universität Dortmund.

Giesecke, Johannes and Groß, Martin (2005): *Arbeitsmarktreform und Ungleichheit.* In: Aus Politik und Zeitgeschichte. 16. 25-31.

Giesecke, Johannes and Groß, Martin (2006): *Befristete Beschäftigung.* In: WSI Mitteilungen. 59. 5. 247-254.

Gillmann, Barbara (2006): *Der Mythos vom flexiblen Arbeitnehmer.* Handelsblatt. Hamburg. 08/03/2006. 5.

Gläser, Jochen and Laudel, Grit (2004): *Experteninterviews und qualitative Inhatlsanalyse.* Wiesbaden: VS Verlag für Sozialwissenschaften.

Godehardt, Birgit; Klinge, Carsten and Schwetje, Ute (2000): *Telearbeit im Mittelstand - Empirische Ergebnisse einer Förderinitiative.* In: Krömmelbein, Silvia and Schmid, Alfons (Ed.). Globalisierung, Vernetzung und Erwerbsarbeit. Theoretische Zugänge und empirische Entwicklungen. Wiesbaden: Deutscher Universitäts-Verlag. 143-176.

Goldschmitt, Wolf H. (2006): *Midas der Kurpfalz.* DIE WELT. Hamburg. 05/20/2006. 18.

Gramsci, Antonio (1999): *Heft 22. Amerikanismus und Fordismus.* In: Gefängnishefte. Band 9. 2061-2101.

Granovetter, Mark (1988): *The Sociological and Economic Approaches to Labor Market Analysis.* In: Farkas, George and England, Paula (Ed.). Industries, Firms, and Jobs. Sociological and Economic Approaches. New York: Plenum Press.

Granovetter, Mark (1995): *Getting a Job: A Study of Contacts and Career.* Chicago: University of Chicago Press.

Groß, Hermann; Munz, Eva and Seifert, Hartmut (2000): *Verbreitung und Struktur von Arbeitszeitkonten.* In: Arbeit. 9 (2000). 3. 217-229.

Groß, Martin (2000): *Flexible Beschäftigungsverhältnisse und Einkommensungleichheit.* 2. Nutzerkonferenz: "Forschung mit dem Mikrozensus: Analysen zur Sozialstruktur und zum Arbeitsmarkt". 10/12-10/13/00. Mannheim.

Hälker, Juri (2004): *Betriebsräte im Rollenkonflikt. Betriebspolitisches Denken zwischen Co-Management und Gegenmacht.* Mering: Rainer Hampp Verlag.

Hartmann, Michael (1995): *Informatiker in der Wirtschaft. Perspektiven eines Berufs.* Berlin, Heidelberg: Springer-Verlag.

Harvey, David (1990): *The Condition of Postmodernity. An Enquiry into the Origins of Cultural Change.* Blackwell: Cambridge MA & Oxford UK.

Haug, Wolfgang Fritz (2003): *High-Tech-Kapitalismus. Analysen zur Produktionsweise, Arbeit, Sexualität, Krieg und Hegemonie.* Hamburg: Argument Verlag.

Haveman, Heather (1993): *Organizational Size and Change. Diversification in the Savings and Loans Industry after Deregulation.* In: Administrative Science Quarterly. 38. 20-50.

Hecker, Ursula (2000): *Berufliche Mobilität und Wechselprozesse.* In: Dostal, Werner; Jansen, Rolf and Parmentier, Klaus (Ed.). Wandel der Erwerbsarbeit: Arbeitssituation, Informatisierung, berufliche Mobilität und Weiterbildung. BeitrAB. 231. Nürnberg: Bundesanstalt für Arbeit. 67-98.

Heintz, Bettina (1993): *Die Herrschaft der Regel. Zur Grundlagengeschichte des Computers.* Frankfurt, New York: Campus Verlag.

Henninger, Annette (2005): *Neue Erwerbsformen, alte Geschlechterarrangements? Kritische Anmerkungen zum Verhältnis von "Arbeit" und "Leben" im Konzept des Arbeitskraftunternehmers.* In: Mischau, Anina and Oechsle, Mechthild (Ed.). Arbeitszeit - Familienzeit - Lebenszeit: Verlieren wir die Balance? Zeitschrift für Familienforschung. Sonderheft 5. Wiesbaden: VS Verlag für Sozialwissenschaften.

Hermann, Simon and von der Gathen, Andreas (2002): *Das große Handbuch der Strategieinstrumente: Werkzeuge für eine erfolgreiche Unternehmensführung.* Frankfurt/Main: Campus Verlag.

Hillmann, Karl-Heinz (1994): *Wörterbuch der Soziologie.* 4., überarbeitete und ergänzte Auflage. Stuttgart: Kröner.

Hirsch, Joachim and Roth, Roland (1986): *Das neue Gesicht des Kapitalismus. Vom Fordismus zum Post-Fordismus.* Hamburg: VSA-Verlag.

Hochschild, Arlie Russell (1983): *The Managed Heart. Commercialization of Human Feeling.* Berkeley, Los Angeles, London: University of California Press.

Hoffmann, Edeltraut and Walwei, Ulrich (1998): *Normalarbeitsverhältnis: ein Auslaufmodell? Überlegungen zu einem Erklärungsmodell für den Wandel der Beschäftigungsformen.* In: MittAB. 3/98. 409-425.

Hoffmann, Edeltraut and Walwei, Ulrich (2000): *Strukturwandel der Erwerbsarbeit. Was ist eigentlich noch "normal"? Die Veränderung der Beschäftigungsformen im Spiegel europäischer Arbeitsmarktstatistiken - Unbefristete Vollzeitbeschäftigung hat fast überall an Bedeutung verloren.* In: IAB Kurzbericht. 14. 1-7.

Hohendanner, Christian and Bellmann, Lutz (2006): *Interne und externe Flexibilität.* In: WSI Mitteilungen. 59. 5. 241-246.

Holtgrewe, Ursula (2001): *Organisationsdilemmata und Kommunikationsarbeit. Call-Center als informatisierte Grenzstellen.* In: Matuschek, Ingo; Henninger, Annette and Kleemann, Frank (Ed.). Neue Medien im Arbeitsalltag. Empirische Befunde - Gestaltungskonzepte - Theoretische Perspektiven. 1. Wiesbaden: Westdeutscher Verlag. 55-70.

Holtgrewe, Ursula (2003): *Informatisierte Arbeit und flexible Organisation: Unterwerfung, Distanzierung, Anerkennungskämpfe?* In: Schönberger, Klaus and Springer, Stefanie (Ed.). Technisierung und Subjektivierung - Zur Veränderung des Arbeitshandelns in der Wissensgesellschaft. Frankfurt a. M., New York: Campus. 21-43.

Holtgrewe, Ursula and Voswinkel, Stephan (2000): *Kundenorientierung zwischen Mythos, Organisationsrationalität und Eigensinn der Beschäftigten.* In: Kotthoff, Hermann and Sauer, Dieter (Ed.). DIENST - LEISTUNG(S) - ARBEIT: Leistung und Kundenorientierung in tertiären Organisationen. Forschungsbericht. München: Institut Sozialwissenschaftlicher Forschung.

Hübner, Kurt (1989): *Theorie der Regulation. Eine kritische Rekonstruktion eines neuen Ansatzes der Politischen Ökonomie.* Berlin: Edition Sigma.

Hübner, Kurt and Mahnkopf, Birgit (1988): *Einleitung.* In: Mahnkopf, Birgit (Ed.). Der gewendete Kapitalismus. Kritische Beiträge zur Theorie der Regulation. Münster: Verlag Westfälisches Dampfboot. 7-28.

Institut der deutschen Wirtschaft Köln (Ed.) (2005): *Deutschland in Zahlen 2005.* Köln: Deutscher Instituts-Verlag GmbH.

Institut für Arbeitsmarkt- und Berufsforschung (IAB) (2004): *Arbeitsmarkt 2004.*

Institute for Women's Policy Research (2006): *The Gender Wage Ratio: Women's and Men's Earnings.* Institute for Women's Policy Research. http://www.iwpr.org/pdf/Updated2006_C350.pdf. Access date: 06/08/06.

Jansen, Dorothea (2003): *Einführung in die Netzwerkanalyse. Grundlagen, Methoden, Forschungsbeispiele.* Opladen: Leske + Budrich.

Keller, Berndt and Seifert, Hartmut (2000): *Flexicurity - Das Konzept für mehr soziale Sicherheit flexibler Beschäftigung.* In: WSI Mitteilungen. 5/2000. 291-300.

Keller, Berndt and Seifert, Hartmut (2002): *Flexicurity - Wie lassen sich Flexibilität und soziale Sicherheit vereinbaren?* In: MittAB. 1/2002. 90-106.

Keller, Berndt and Seifert, Hartmut (2006): *Atypische Beschäftigungsverhältnisse: Flexibilität, soziale Sicherheit und Prekarität.* In: WSI Mitteilungen. 59. 5. 235-240.

Kieser, Alfred (Ed.) (2002): *Organisationstheorien.* Stuttgart: W. Kohlhammer.

Klahn, Markus and Stephan, Rolf (2004): *Outsourcing spaltet die IT-Branche. Pro: "Vorurteile gegen Auslagerung ablegen". Kontra: "Know-how schützen".* COMPUTERWOCHE online. 02.04.2004.

Knoke, David (2001): *Changing Organizations. Business Networks in the New Political Economy.* Boulder, Colorado; Oxford: Westview Press.

Kordey, Norbert (2002): *Verbreitung der Telearbeit in 2002. Internationaler Vergleich und Entwicklungstendenzen.* Bonn: Empirica. Kommunikations- und Technologieforschung.

Krämer, Sybille (1988): *Symbolische Maschinen. Die Idee der Formalisierung in geschichtlichem Abriß.* Darmstadt: Wissenschaftliche Buchgesellschaft.

Krätke, Stefan (1990): *Städte im Umbruch. Städtische Hierarchien und Raumgefüge im Prozeß gesellschaftlicher Restrukturierung.* In: Borst, Renate and Krätke, Stefan (Ed.). Das neue Gesicht der Städte. Theoretische Ansätze und empirische Befunde aus der internationalen Debatte. Basel, Boston, Berlin: Birkhäuser. 7-38.

Kratzer, Nick (2003): *Arbeitskraft in Entgrenzung. Grenzenlose Anforderungen, erweiterte Spielräume, begrenzte Ressourcen.* Berlin: Edition Sigma.

Kratzer, Nick (2004): *Vermarktlichung und Individualisierung - Zur Produktion von Ungleichheit in der Zweiten Moderne.* Vortrag auf dem 32. Kongress der Deutschen Gesellschaft für Soziologie (unveröffentlicht). München.

Kress, Ulrike (1998): *Vom Normalarbeitsverhältnis zur Flexibilisierung des Arbeitsmarktes - Ein Literaturbericht.* In: MittAB. 3/98. 488-505.

Krömmelbein, Silvia (2004): *Kommunikativer Stress in der Arbeitswelt. Zusammenhänge von Arbeit, Interaktion und Identität.* Berlin: Edition Sigma.

Kühl, Stefan (2004): *Arbeits- und Industriesoziologie.* Bielefeld: Transcript Verlag.

Lash, Scott and Urry, John (1987): *The End of Organized Capitalism.* Blackwell Publishers.

Lash, Scott and Urry, John (1994): *Economics of Signs and Space.* London: Sage.

Lee, Heejin and Sawyer, Steve (2002): *Conceptualizing Time and Space: Information Technology, Work and Organization.* In: Galliers, Robert; Applegate, Lynda and DeGross, Janice (Ed.). Proceedings of the 2002 International Conference on Information Systems. Barcelona, Spain: ACM Press. 1-29.

Lehndorff, Steffen (2001): *Weniger ist mehr. Arbeitszeitverkürzung als Gesellschaftspolitik.* Hamburg: VSA-Verlag.

Lehndorff, Steffen (2002): *"Tertiarisierte" Arbeit und nachhaltige Entwicklung des Arbeitsvermögens. Über die zukünftige Bedeutung von Arbeitszeitregulierung.* In: Bosch, Gerhard; Hennicke, Peter; Hilbert, Josef; Kristof, Kora and Scherhorn, Gerhard (Ed.). Die Zukunft von Dienstleistungen. Ihre Auswirkung auf Arbeit, Umwelt und Lebensqualität. Frankfurt am Main: Campus Verlag GmbH.

Leonard, Jonathan S. and Levine, David I. (2006): *The Effect of Diversity on Turnover: A Large Case Study.* In: Industrial and Labor Relations Review. 59. 4. 574-572.

Ludewig, Oliver (2001): *Betriebliche Bestimmungsgründe von Arbeitszeitkonten.* In: MittAB. 3/2001. 302-313.

Mahnkopf, Birgit (1987): *Hegemonie und Konsens. Regulationsmuster betrieblicher Sozialbeziehungen und ihre Legitimationseffekte.* In: Arbeitsmarkt, Arbeitsbeziehungen und Politik in den 80er Jahren. Leviathan-Sonderheft 8. 253-269.

Matthies, Hildegard; Mückenberger, Ulrich; Offe, Claus; Peter, Edgar and Raasch, Sibylle (Ed.) (1994): *Arbeit 2000. Anforderungen an eine Neugestaltung der Arbeitswelt - Eine Studie der Hans-Böckler-Stiftung.* Reinbek: Rowohlt Taschenbuch Verlag.

Mayring, Philipp (1993): *Qualitative Inhaltsanalyse. Grundlagen und Techniken.* Weinheim: Deutscher Studien Verlag.

Mertens, A. and McGinnity, F. (2005): *Einkommensverluste durch befristete Beschäftigung? Ein Überblick über den Stand der Debatte in Deutschland.* In: Kronauer, M. and Linne, G. (Ed.). Flexicurity. Die Suche nach Sicherheit in der Flexibilität. Berlin? 169-182.

Metzger, Bernhard; Bernard, Ursin and Staffelbach, Bruno (2003): *Der Einfluss der Telearbeit auf die Identifikation mit dem Unternehmen. Empirisch analysiert am Beispiel einer Versicherungsunternehmung.* In: Arbeit. 12. 2. 147-162.

Meuser, Michael and Nagel, Ulrike (1991): *ExpertInneninterviews - vielfach erprobt, wenig bedacht. Ein Beitrag zur qualitativen Methodendiskussion.* In: Garz, Detlef and Kraimer, Klaus (Ed.). Qualitativ-empirische Sozialforschung. Opladen: 441-471.

Micheli, Jordy (2002): *Digitalfacture: Flexibilization, the Internet and Knowledge Workers.* Comercio Exterior. http://revistas.bancomext.gob.mx/rce/en/articleReader.jsp?id=3&idRevista=12. Access date: 11/14/2005.

Mikl-Horke, Gertraude (1997): *Industrie- und Arbeitssoziologie.* München, Wien: R. Oldenbourg Verlag.

Mintzberg, Henry and McHugh, Alexandra (1985): *Strategy Formation in an Adhocracy.* In: Administrative Science Quarterly. 30. 160-197.

Mohr, S. (2005): *Zukunftskonzepte für die Arbeitsplatzkultur.* Diplomarbeit. Rosenheim: Fachhochschule Rosenheim.

Moldaschl, Manfred and Voss, G. Günter (Ed.) (2002): *Subjektivierung von Arbeit.* München und Mering: Rainer Hampp.

Mückenberger, Ulrich (1985): *Die Krise des Normalarbeitsverhältnisses. Hat das Arbeitsrecht noch Zukunft?* In: Zeitschrift für Sozialreform. 31. 457-475.

Müller, Karlheinz (2004): *ProIT-Report Nr. 1: IT- Aus- und Weiterbildung. Diagonale Karriere im Beruf.* TU Darmstadt. http://www.proit-professionals.de/dokumente/ProIT-Report_1.pdf. Access date: 04/15/06.

National Research Council (US) and Committee on Workforce Needs in Information Technology (2001): *Building a Workforce for the Information Economy.* Washington, D. C.: National Academy Press.

Negt, Oskar (2004): *Wozu noch Gewerkschaften? - Eine Streitschrift.* Göttingen: Steidl Verlag.

Nora, Simon and Minc, Alain (1979): *Die Informatisierung der Gesellschaft.* Frankfurt am Main, New York: Französisches Orginal "L'informatisation de la Société" 1978.

Nordhause-Janz, Jürgen and Pekruhl, Ulrich (Ed.) (2000): *Arbeiten in neuen Strukturen? Partizipation, Kooperation, Autonomie und Gruppenarbeit in Deutschland.* München und Mering: Rainer Hampp Verlag.

OECD (2002): *Taking the Measurement of Temporary Employment.* In: OECD (Ed.). OECD Employment Outlook. Paris: OECD. 127-185.

Ohno, Taijchi (1993): *Das Toyota Produktionssystem.* Frankfurt am Main: Campus Verlag.

Osterman, Paul (1999): *Securing Prosperity. The American Labor Market: How It Has Changed and What to Do About It.* Princton, New Jersey: Princeton University Press.

Osterman, Paul (2004): *Labor Market Intermediaries in the Modern Labor Market.* In: Giloth, Robert P. (Ed.). Workforce Intermediaries for the Twenty-first Century. Philadelphia: Temple University Press. 155-169.

Osterman, Paul and Burton, Diane M. (2005): *Ports and Ladders. The Nature and Relevance of Internal Labor Markets in a Changing World.* In: Ackroyd, Stephen; Batt, Rosemary; Thomson, Paul and Tolbert, Pamela S. (Ed.). The Oxford Handbook of Work and Organization. USA: Oxford University Press. 425-445.

Ozaki, Muneto (Ed.) (1999): *Negotiating Flexibility. The Role of the Social Partners and the State.* Geneva: International Labour Office.

Pereverzeva, Svetlana and Seger, Mario (2005): *ProIT-Report Nr. 2: Perspektiven mit der neuen IT-Weiterbildung. Eine Umfrage unter Teilnehmerinnen und*

Teilnehmern der IT-Professional-Weiterbildung. TU Darmstadt. Access date: 04/15/2006.

Piore, Michael and Sabel, Charles (1984): *The Second Industrial Divide: Possibilities for Prosperity.* New York: Basic Books.

Polanyi, Karl (1978): *The Great Transformation. Politische und ökonomische Ursprünge von Gesellschaften und Wirtschaftssystemen.* Frankfurt: Suhrkamp Verlag.

Pollert, A. (1988): *Dismantling Flexibility.* In: Capital and Class. 34. 42-75.

Pongratz, Hans J. and Voß, G. Günter (2000): *Vom Arbeitnehmer zum Arbeitskraftunternehmer - Zur Entgrenzung der Ware Arbeitskraft.* In: Minssen, Heiner (Ed.). Begrenzte Entgrenzungen. Wandlungen von Organisation und Arbeit. Berlin: edition sigma. 225-247.

Pongratz, Hans J. and Voß, G. Günter (2003): *Arbeitskraftunternehmer. Erwerbsorientierungen in entgrenzten Arbeitsformen.* Berlin: Edition Sigma.

Popken, Monika (2005): *Flexibilität, Kommunikation und Wohlbefinden im non-territorialen Büro.* Diplomarbeit. München: Ludwig-Maximilians-Universität München.

Porat, Marc Uri (1977): *The Information Economy. Defintion and Measurement.* Washington D. C.: Department of Commerce/Office of Telecommuication Special Publication.

Powell, Walter W. (1990): *Neither Market nor Hierarchy: Network Forms of Organizations.* In: Staw, Barry and Cummings, Larry L. (Ed.). Research in Organizational Behavior. Greenwich: JAI Press. 295-336.

Price, Lee (2004): *The Longest Sustained Labor Slump since the Great Depression Is Taking a Toll on Working Families.* Economic Policy Institute. http://www.epinet.org. Access date: 02/09/2006.

Promberger, Markus; Böhm, Sabine; Heyder, Thilo; Pamer, Susanne and Strass, Katharina (2002): *Hochflexible Arbeitszeiten in der Industrie - Chancen, Risiken und Grenzen für Beschäftigte.* Berlin: Edition sigma.

Rammert, Werner (1997): *Innovation im Netz. Neue Zeiten für technische Innovationen: heterogen verteilt und interaktiv vernetzt.* In: Soziale Welt. 48. 397-416.

Rassuli, Ali (2005): *Evolution of the Professional Contingent Workforce.* In: Journal of Labor Research. XXVI. 4. 689-710.

Reich, Robert B. (1993): *Die neue Weltwirtschaft. Das Ende der nationalen Ökonomie.* Frankfurt am Main: Fischer Taschenbuch Verlag. Orig. Title: The Work of Nations (1991). New York: Alfred A. Knopf.

Reinhold, Gerd (Ed.) (1997): *Soziologie-Lexikon.* 3., überarbeitete und erweiterte Auflage. München, Wien: R. Oldenbourg Verlag.

Rifkin, Jeremy (1995): *Das Ende der Arbeit und ihre Zukunft.* Frankfurt am Main, New York: Campus Verlag.

Roth, Siegfried (2003): *Wissensvernetzung und lernende Organisation.* In: Bsirske, Frank; Endl, Hans-L.; Schröder, Lothar and Schwemmle, Michael (Ed.). Wissen ist was wert. Wissensmanagement. Hamburg: VSA-Verlag. 166-175.

Sassen, Saskia (1996): *Metropolen des Weltmarkts. Die neue Rolle der global cities.* Frankfurt am Main: Campus Verlag. Orig. Title: Cities in a World Economy (1994). Thousand Oaks., CA: Pine Forge Press.

Sassen, Saskia (2000): *Machtbeben. Wohin führt die Globalisierung?* Stuttgart, München: Deutsche Verlags-Anstalt.

Sauer, Dieter and Döhl, Volker (1994): *Kontrolle durch Autonomie - Zum Formwandel von Herrschaft bei unternehmensübergreifender Rationalisierung.* In: Sydow, Jörg and Windeler, Arnold (Ed.). Management internationaler Beziehungen. Vertrauen, Kontrolle und Informationstechnik. Opladen: VS Verlag für Sozialwissenschaften. 258-274.

Saxenian, AnnaLee (1996): *Beyond Boundaries: Open Labor Markets and Learning in Silicon Valley.* In: Arthur, Michael B. and Rousseau, Denise M. (Ed.). The Boundaryless Career. New York: Oxford University Press. 23-39.

Sayer, Andrew (1989): *Postfordism in Question.* In: International Journal of Urban and Regional Research. 13. 666-695.

Schäfer, Claus (2003): *Effektiv gezahlte Niedriglöhne in Deutschland.* In: WSI Mitteilungen. 7/2003. 420-428.

Schienstock, Gerd (1998): *Flexibilisierung in der Informationsgesellschaft.* In: Zilian, Hans Georg and Flecker, Jörg (Ed.). Flexibilisierung - Problem oder Lösung? Berlin: Edition Sigma. 163-174.

Schilcher, Christian (2006): *Implizite Dimensionen des Wissens und ihre Bedeutung für betriebliches Wissensmanagement.* Dissertation. Technische Unitersität Darmstadt.

Schiller, Dan (2000): *Digital Capitalism. Networking the Global Market System.* Cambridge, Massachusetts, London, England: The MIT Press.

Schlüter, R. (1999): *"Designer sollen wieder kritischer sein". Gespräch mit dem amerikanischen Soziologen Richard Sennett über das flexible Büro, den Verlust des Privaten und die soziale Verantwortung von Gestaltern.* In: Form. 170. 52-53.

Schmid, Günther (2000): *Arbeitsplätze der Zukunft. Von standardisierten zu variablen Arbeitsverhältnissen.* In: Kocka, Jürgen and Offe, Claus (Ed.). Geschichte und Zukunft der Arbeit. Frankfurt am Main: Campus. 269-292.

Schmiede, Rudi (1996a): *Informatisierung und gesellschaftliche Arbeit.* In: Schmiede, Rudi (Ed.). Virtuelle Arbeitswelten. Arbeit, Produktion und Subjekt in der "Informationsgesellschaft". Berlin: Edition Sigma. 107-128.

Schmiede, Rudi (Ed.) (1996b): *Virtuelle Arbeitswelten. Arbeit, Produktion und Subjekt in der "Informationsgesellschaft".* Berlin: Edition Sigma.

Schmiede, Rudi (1997): *Die Entwicklung betriebsinterner Arbeitsmarktstrukturen in Deutschland. Theoretische Fragen und historische Perspektiven (Studien zur Geschichte betriebsinterner Arbeitsmärkte in Deutschland, Teil 4 und 5).* In: Arbeitspapiere aus dem Arbeitskreis Sozialwissenschaftliche Arbeitsmarktforschung SAMF. 1997-2. 125pp.

Schmiede, Rudi (2003): *Informationstechnik im gegenwärtigen Kapitalismus.* In: Böhme, Gernot and Manzei, Alexandra (Ed.). Kritische Theorie der Technik und der Natur. München: Wilhelm Fink Verlag. 173-183.

Schmiede, Rudi (2006): *Wissen und Arbeit im "Informational Capitalism".* In: Baukrowitz, Andrea; Berker, Thomas; Boes, Andreas; Pfeiffer, Sabine; Schmiede, Rudi and Will, Mascha (Ed.). Informatisierung der Arbeit - Gesellschaft im Umbruch. Berlin: Edition Sigma. 457-490.

Schröter, Hans Georg (2006): *Lage am Arbeitsmarkt entspannt.* Frankfurter Rundschau. Frankfurt. 10.

Schwemmle, Michael (2005): *Offshoring und Gewerkschaften.* In: Boes, Andreas and Schwemmle, Michael (Ed.). Bangalore statt Böblingen? Offshoring und Internationalisierung im IT-Sektor. Hamburg: VSA-Verlag. 144-162.

Seger, Mario (2005): *Alternierende Telearbeit - flexible Grenzen. Charakter, Konditionen und Effekte eines modernisierenden Arbeitszeitmodells.* Dissertation. Darmstadt: TU Darmstadt.

Seifert, Hartmut (1998): *Modellwechsel durch Arbeitszeitkonten.* In: Klenner, Christina and Seifert, Hartmut (Ed.). Zeitkonten - Arbeit a la carte? Hamburg: VSA Verlag. 9-26.

Seifert, Hartmut (2001): *Zeitkonten: Von der Normalarbeitszeit zu kontrollierter Flexibilität.* In: WSI Mitteilungen. 2/2001. 84-91.

Seifert, Hartmut (2005): *Arbeitszeitpolitischer Modellwechsel: Von der Normalarbeitszeit zu kontrollierter Flexibilität.* In: Seifert, Hartmut (Ed.). Flexible Zeiten in der Arbeitswelt. Frankfurt am Main: Campus Verlag. 40-66.

Sengenberger, Werner (1984): *Zur Flexibilisierung im Beschäftigungssystem. Ein Vergleich zwischen den USA und der Bundesrepublik Deutschland.* In: SAMF Arbeitspapier 1984 - 3. 43.

Sennett, Richard (1998): *The Corrosion of Character: The Personal Consequences of Work in the New Capitalism.* New York: W. W. Norton & Company.

Shipler, David (2004): *The Working Poor. Invisible in America.* New York: Afred A. Knopf.

Sill, Stephanie (2005): *Die Destandardisierung und Flexibilisierung der Erwerbsarbeit und Konsequenzen für soziale Ungleichheit.* Dissertation. Duisburg: Universtität Duisburg-Essen.

Silver, Beverly J. (2003): *Forces of Labor. Workers' Movements and Globalization since 1870.* Cambridge: Cambridge University Press.

Smentek, Martin (1991): *Arbeitszeit-Flexibilisierung. Zwischen "kapitalistischer Zeitökonomie" und "sozialer Zeitstruktur".* Hamburg: VSA-Verlag.

Spath, Dieter and Kern, Peter (Ed.) (2003): *Office 21. Zukunftsoffensive Office 21 - Mehr Leistung in innovativen Arbeitswelten.* Köln, Stuttgart/London: Egmont vgs verlagsgesellschaft mbH, Brighten the Corners.

Spillane, Shannon and Coleman, Nancy (2006): *Income Inequality Grew Across the Country Over the Past Two Decades. Early Signs Suggest Income Inequality Now Growing Again After Brief Interruption.* Economic Policy Institute. Center on Budget and Policy Priorities. http://www.epinet.org/newsroom/releases/2006/01/1-26-06-sfpNATL-pr-FINAL.pdf. Access date: 02/09/2006.

Standing, Guy (1999): *Global Labour Flexibility. Seeking Distributive Justice.* London, New York: MacMillan Press Ltd., St. Martin's Press, Inc.

Staniek, Bettina (2005): *Büroorganisationsformen.* In: Eisele, Johann and Staniek, Bettina (Ed.). BürobauAtlas: Grundlagen, Planung, Technologie, Arbeitsplatzqualitäten. München: Callwey Verlag. 54-67.

Statistisches Bundesamt (Ed.) (2002): *Informationsgesellschaft.* Stuttgart: Metzler-Poeschel.

Statistisches Bundesamt (2003): *Population of Germany Today and Tomorrow 2002 - 2050.* Wiesbaden: Statistische Bundesamt.

Statistisches Bundesamt (Ed.) (2005a): *Datenreport 2004. Zahlen und Fakten über die Bundesrepublik Deutschland.* 2. Aufl. Bonn: Bundeszentrale für politische Bildung.

Statistisches Bundesamt (2005b): *Pressemitteilung vom 8. März 2005. Exporte von IKT-Produkten stiegen 2004 um 11%.* Statistisches Bundesamt. Access date: 04/05/2006.

Steinbicker, Jochen (2001): *Zur Theorie der Informationsgesellschaft. Ein Vergleich der Ansätze von Peter Drucker, Daniel Bell und Manuel Castells.* Opladen: Leske + Budrich.

Stiglitz, Joseph E. (2004): *Die Roaring Nineties. Der entzauberte Boom.* 2. Auflage. Berlin: Siedler Verlag. 2003. The Roaring Nineties. A New History of the World's Most Prosperous Decade.

Strengmann-Kuhn, Wolfgang (2003): *Armut trotz Erwerbstätigkeit. Analysen und sozialpolitische Konsequenzen.* Frankfurt: Campus.

Süddeutsche Zeitung (2006a): *Nur 40 Prozent der Arbeitnehmer mit Vertretung.* Süddeutsche Zeitung. München. 03/04/3006. 27.

Süddeutsche Zeitung (2006b): *SAP hat jetzt einen Betriebsrat.* Süddeutsche Zeitung. Stuttgart. 23.06.2006. 22.

Tanner, Jakob (1999): *Fordismus.* In: Haug, Wolfgang Fritz (Ed.). Historisch-kritisches Wörterbuch des Marxismus. Hamburg, Berlin: Argument. 580-587.

Taylor, Frederick W. (1967 [1911]): *The Principles of Scientific Managment.* New York, London: Norton & Company.

US Department of Labor and US Bureau of Labor Statistics (2005): *A Profile of the Working Poor. Report 983.* US Department of Labor, US Bureau of Labor Statistics. http://www.bls.gov/cps/cpswp2003.pdf. Access date: 05/26/2006.

US Department of Labor Bureau of Labor Statistics (2005): *Contingent and Alternative Employment Arrangements, Februrary 2005.* US Bureau of Labor Statistics. http://www.bls.gov/news.release/conemp.nr0.htm. Access date: 10/15/2005.

van der Voordt, Theo J. M. (2004): *Productivity and Employee Satisfaction in Flexible Workplaces.* In: Journal of Corporate Real Estate. 6. 2. 133-148.

Verdi (2006): *Prekäre Beschäftigung.* http://gender.verdi.de/genderwegweiser/themen_daten/erwerbstaetigkeit/prekaere. Access date: 08/01/06.

Viehöver, Ulrich (2003): *Selbst ist die Belegschaft.* Die Zeit. Hamburg. 22.

Voß, G. Günter and Pongratz, Hans J. (1998): *Der Arbeitskraftunternehmer. Eine neue Grundform der Ware Arbeitskraft?* In: Kölner Zeitschrift für Soziologie und Sozialpsychologie. 50. 131-158.

Wagner, Alexandra (2001): *Entgrenzung der Arbeit und der Arbeitszeit?* In: Arbeit. Jg 10 (2001). Heft 3. 365-378.

Weber, Max (1972): *Wirschaft und Gesellschaft.* Tübingen: J. C. B. Mohr (Paul Siebeck).

Webster, Frank (2002): *Theories of the Information Society.* 2. London, New York: Routledge.

Welsch, Johann (2000): *Die Zukunft der Arbeitsgesellschaft. Ein Blick zurück von Morgen.* In: WSI Mitteilungen. 10/2000. 629-638.

Welsch, Johann (2001a): *Fachkräftemangel: Blockieren Qualifikationsdefizite die New Economy?* In: Arbeit. 10. 3. 262-275.

Welsch, Johann (2001b): *Wachstums- und Beschäfitungsmotor IT-Branche - Fachkräftemangel, Green Card und Beschäftigungspotentiale.* Friedrich-Ebert-Stiftung, Bonn. www.fes.de/internetoekonomie. Access date: 06/09/06.

Williams, Karel; Cutler, Tony; Williams, John and Haslam, Colin (1987): *The End of Mass Production?* In: Economy and Society. 16. 3. 405-439.

Wirth, Carsten (2006): *Arbeitsmarktintegration, personale Netzwerke und die öffentliche Arbeitsvermittlung.* In: WSI Mitteilungen. 59. 2. 104-109.

Wolf, Harald (2000): *Das Netzwerk als Signatur der Epoche? Anmerkungen zu einigen neueren Beiträgen zur soziologischen Gegenwartsdiagnose.* In: Arbeit. 9. 2. 95-104.

WSI Tarifarchiv (2005): *Tarifbindung 2004.* Hans-Böckler Stiftung. http://www.boeckler.de/pdf/ta_tarifbindung_2004.pdf. Access date: 07/14/2006.

Yin, Robert K. (1994): *Case study Research: Design and Methods.* Thousand Oaks, London, New Delhi: Sage Publications.

Zander, Gabrielle (2005): *Zum Einfluss des Büroraumkonzepts auf unternehmerische Erfolgsfaktoren.* Diplomarbeit. Berlin: Humboldt-Universität zu Berlin.

Zander, Gabrielle and Muschiol, Roman (2005): *Vom Nutzen der Nutzerbeteiligung.* In: Congena Texte. 1. 2. 37-43.

Zarcula, Andreea-Malvina (2006): *Wissensmanagement in Forschungseinrichtungen. Konzeption und Praxis.* Dissertation. Technische Universität Darmstadt.

Zentrum für Europäische Wirtschaftsforschung GmbH (2001): *IKT-Fachkräfte und Qualifikationsbedarf. Empirische Analyse für das Verarbeitende Gewerbe und ausgewählte Dienstleistungssektoren in Deutschland.* Zentrum für Europäische Wirtschaftsforschung GmbH (ZEW). 1.7.2001. Mannheim.

Zilian, Hans Georg (1998): *Einleitung: Flexibilisierung - eine Lösung, die zum Problem wird?* In: Zilian, Hans Georg and Flecker, Jörg (Ed.). Flexibilisierung - Problem oder Lösung? Berlin: Edition Sigma. 9-28.

Zilian, Hans Georg and Flecker, Jörg (Ed.) (1998): *Flexibilisierung - Problem oder Lösung?* Berlin: Edition Sigma.

Curriculum Vitae

Person	
	Tina Klug geboren am 09. Mai 1976 in Frankfurt am Main
Berufliche Tätigkeiten	
seit 08/2006	Mitarbeiterin der Wissenschaftlichen Leitung des Instituts für Arbeitsmarkt- und Berufsforschung (IAB), Nürnberg
07/2001 - 04/2003	Leiterin des Schweizer Banken Fonds bei der Conference on Jewish Material Claims against Germany, Inc. (Claims Conference), Frankfurt
09/2000 - 06/2001	Referentin für Finanzen und Jugendpolitik / stellvertretende Geschäftsführerin beim Bund Deutscher PfadfinderInnen e. V. (BDP), Bundesverband, Frankfurt
Promotion	
04/2003 - 02/2007	Promotion an der Technischen Universität Darmstadt, Graduiertenkolleg „Technisierung und Gesellschaft“ Abschluss: Dr. rer. pol., magna cum laude
Wissenschaftliche Tätigkeiten	
04/2006 - 07/2006	Lehre: Hauptseminar „Arbeitsräume – Arbeitswelten“
01/2004 - 07/2006	Mitarbeit beim interdisziplinären Forschungsprojekt „Arbeitswelten“
01/2004 - 01/2005	Mitarbeit beim Forschungsprojekt „Kooperationsnetz prospektive Arbeitsforschung“ (KOPRA), Plattform „Informatisierte Arbeit“
Bildung	
1995 - 2000	Studium der Volkswirtschaftslehre sozialwissenschaftlicher Richtung, Universität zu Köln Abschluss: Diplom-Volkswirtin (Note 2,2; Diplomarbeit 1,0)
1995	Abitur, Bachgauschule Babenhausen (Note 1,5)
Stipendien	
07/2003 - 06/2006	Promotionsstipendium der Deutschen Forschungsgemeinschaft (DFG) für das Graduiertenkolleg „Technisierung und Gesellschaft“
08/1992 - 07/1993	Parlamentarisches Patenschaftsprogramm des Deutschen Bundestages und des U. S. amerikanischen Kongresses
Auslandsaufenthalte	
08/2005 - 12/2005	Forschungsaufenthalt an der Pennsylvania State University, State College, PA, USA
07/1997 - 08/1997	Praktikum bei Youth For Understanding International Exchange, Washington, D.C., USA
08/1992 - 07/1993	Austauschschülerin, Carrollton, TX, USA Abschluss: High School Diplom

Darmstadt, Juli 2007