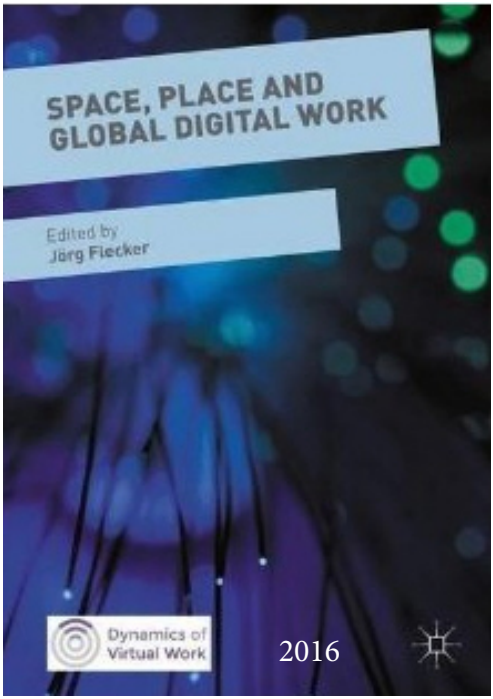
Jörg Flecker
Editor

Space, Place and Global Digital Work



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Introduction

Jörg Flecker

Compared with assembling engines, hairdressing or care work, digital work is clearly less place-bound. This makes possible new constellations of space for all kinds of work that rely heavily on information and communication technology (ICT). While it is argued that digital work can be done anywhere, labour, as with all human activities, always 'takes place' in particular localities. These localities are far from being evenly distributed in geographic space; there is thus no 'areal uniformity' (Graham 1998). Rather, activities in the internet age are actually more and more clustered in 'nodal landing places' (Castells 2010) of transnational networks. Thus, while remote and mobile digital work are the result of the tendency to free work from particular places, closer scrutiny reveals that place and distance keep up their importance, giving rise to new, more complicated spatial dynamics in the organization of work (Swyngedouw 1993). Digital businesses and work in the current political economy do show particular historical spatial fixes of capital valorisation (Harvey 1982) even though the dynamics and fluidity may be much higher than in other industries or epochs. This is to say that the combinations of capital, labour, occupational milieus, etc. in a particular location can be expected to be more transient and the 'territorial embeddedness'

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(Hess 2004) weaker than with other business activities. Still, as a starting point of analysing space, place and digital work we can assume that digital work is characterised by both 'placelessness' *and* stickiness, by both dispersion *and* spatial concentration.

The spatial relation in this context relates, among others, to the geographies of digital work at a transnational or global scale. Since the wave of offshoring in the 1990s and 2000s we have observed a delocalisation of service functions, including customer service, software development or creative and administrative tasks (Huws et al. 2004, Holtgrewe 2014). What is more, work seems to become virtual if work objects are digital and tools and knowledge are standardised at a global scale with the internet providing access to information spaces from all localities with sufficient connectivity (Huws 2006). 'Informatisation', understood as the growing importance of information and information processing (Schmiede 1996), is not a new phenomenon but a long term societal development that has brought about the conditions for many forms of digital work. Today, the shift to services and the tertiarisation of manufacturing in the so-called knowledge economy accelerate the spread of digital work and intensify the worldwide competition between educated workers, the global 'cybertariat' (Huws 2003).

'New geographies' of various industries in the digital economy are emerging as a result of the tendency to offshore administrative, service and creative functions. The relocation of work at a global scale, best epitomised by the ascent of India's information technology (IT) and business process outsourcing industries (Parthasarathy 2005, Taylor et al. 2014), signaled a new 'new international division of labour' after the one in manufacturing from the 1960s onwards. In addition to concerns about employment in the old global core, as well as regional development in the periphery, this raised questions about the nature and dynamics of global value chains and networks and their consequences for workers. In recent years, both the spatial aspects of labour processes and the role of labour in global value chains have received increased scholarly attention. This has resulted in more and more interlinkages between the fields of Labour Process Analysis and Global Production Networks (Newsome et al. 2015, Coe 2015). The spatial dynamics of digital work at a transnational and

global scale can be informed by these debates and, in turn, contribute to them.

Apart from the movements of global value chains and networks and the changes in the international division of labour, the emergence of internet-based business models, forms of labour and ways of working have become crucial for the delocalisation of digital work. From applications for computer-supported cooperative work within corporations to the dispersion of tasks over crowdsourcing platforms, it is a common feature of a wide range of phenomena that work seems to move to global information spaces (Boes and Kämpf 2010) where collaboration takes place and value is created. As a consequence, debates on digital work address the interrelations between different types of spaces: physical and geographical space, organisational space, cultural space and social space. In particular, transnational social spaces (Pries 2008) and global digital formations (Latham and Sassen 2005) rely on mediatisation and the use of electronic networks. It is important to note, however, that the digital does not dissolve into cyberspace. Rather, software and data, often seen as immaterial, remain bound to a material fabric of physically-composed infrastructures of computers and networks (Kinsley 2013).

What is more, in these debates the global and the local are not seen as mutually exclusive and hierarchically ordered (Herod 2008). Rather, the global economy touches down in various national territories, 'its topography moves between digital space and places in national territories' (Sassen 2007:32). As a consequence of movements of denationalisation, 'global processes do not need to move through the hierarchies of national states; they can directly become articulated with certain kinds of localities and local actors' (ibid: 33) elsewhere. To understand the characteristics of the local and the global and to conceptualise the interrelations between them, we are referring to the concept of spatial scales (Brenner 2001). It seems helpful to consider various manifestations of digital work as multi-scalar phenomena taking place in a particular locality of the office, the home or a local occupational network and simultaneously being shaped by and impacting on activities and structures on other spatial scales such as the national, transnational or global.

This edited volume looks at current analyses of digital workplaces and workers within the complex tension between tremendously enlarged

options for delocalising work and restructuring global value chains on the one hand and, on the other, the embeddedness of knowledge, activities and relationships in particular localities between the potential ubiquity of virtual collaboration and the need for face-to-face contact and particular competences to cope with these new working environments. The volume seeks to feature a wide range of both established and emerging spatial dynamics and to enhance our understanding of the concepts of space and place in the study of digital work. It explores the dynamics of global value chains and shifts in the international division of labour, the impact these have on employment and working conditions, workers' agency in shaping and coping with changes in work, and the new capabilities and competencies needed in virtual organisational environments. Thus, the volume does not engage in the debate about the interaction between the technological transformation of society and the evolution of its spatial forms (Castells 2010). Rather, combining different disciplinary perspectives, the volume teases out the spatial aspects of digital work at different scales ranging from the team level to that of global production networks.

The volume's first part is dedicated to exploring the shaping of digital work and its spatial dynamics. The main focus lies with the preconditions and consequences of delocalisation of ICT-enabled work. While it is often assumed that for digital work space and place are of decreasing relevance, little is said about the necessary restructuring and the ensuing characteristics of labour processes that bring about this kind of digital work. Nor is there a focus on the limitations to dislocation inherent in the work itself, the social relations or the physical artefacts involved. Currently, interest in workers' agency in global production networks is gaining currency (Newsome et al. 2015), raising questions about the role of spatially dispersed workers and their opportunities for collective organisation.

In their contribution, Flecker and Schönauer discuss the preconditions of delocalisation, arguing that digital work cannot be assumed to be 'placeless'. If delocalisation is possible, as a rule this stems from active designing and shaping of work so that it can be carried out in different places or by dispersed teams. As a consequence, the character of work is being changed in this process. This view is corroborated by Will-Zochol's

study on engineering work in the automotive industry presented in the second chapter.

The chapter describes the emergence of new topologies of work through informatisation and globalisation of product development. Codification of knowledge, virtualisation of artefacts and standardisation of tasks and processes make delocalisation possible. Yet, as virtual representations cannot replace physical prototypes completely and spatial proximity is partly highly valued, there are clear limits to the globalisation of engineering work. In the third chapter, Lehdonvirta takes up the issue using micro-work as an empirical example. He argues that micro-work is not inherently delocalised work. Rather, microwork platforms make specific efforts and use particular technologies that render work relatively placeless. As workers do not come together in workplaces, it is difficult for them to know each other and to develop shared identities, trust and solidarity, which, in turn, weakens their bargaining power and obstructs attempts to reach collective organisation.

In the second part of the volume the focus is on the dynamics of value chains in various industries and business functions looking at the globalisation of production, interfirm relations and the quality of work and employment. Here, spatial aspects relate to different scales and several levels of enquiry such as the geographies of the international and interregional division of labour that stem from the dynamics of foreign direct investment and the restructuring of global value chains and production networks. Hardy and Hollinshead take as a starting point the footloose nature and placelessness of digital work in business services and IT and ask about the benefits that can be brought to the countries, regions and localities within which they are (re)located. Using the concept of territorial embeddedness, they analyse to what extent business services offshored to the Central and Eastern Europe (CEE), and IT programming relocated to Ukraine, are 'sticky' in these places. They show that both occupy a peripheral position in global divisions of labour for digital work for which they are in constant competition with other 'places'. In her contribution, Sproll links global dynamics in the financial sector with restructuring at national and regional levels and its social effects. Drawing on empirical research on the formation of call centres within banks and the outsourcing of banking services to external call centres in Brazil, she describes

changes in the organisation of work and ambiguous inequalities with regard to gender, race and class stemming from deepening labour market segmentations. Using the Brazilian city of Londrína as an example, Wolff explores the implication of global value chains for local development in the context of programmes for the promotion of entrepreneurship and the generation of employment in Brazil. Presenting such 'Local Productive Arrangements' for information technology as chains of precarisation, the chapter draws conclusions regarding the impact of these policies on the quality of work. Noronha and D'Cruz focus on IT and IT-enabled services in India and describe how the Indian state created, differing by geographical regions, the enabling conditions for Indian IT firms to engage with global markets by enhancing the quality of human resources. They also point to the often ignored role of the state in granting exemptions to labour regulations. As a consequence, economic upgrading achieved by inserting the IT and related service industries into global production networks has not resulted in social upgrading.

The third part of this volume addresses digital work on the levels of the organisation and the labour process. Here, the focus is on how individuals and groups manage distributed and mobile work and social relationships in different spaces: the physical space (and place), the various social spaces and the information space. The working conditions of virtual workers are analysed in relation to concepts of marginality in organisational spaces, trust within teams, skill needs or cultural heterogeneity. In her contribution, Koslowski examines how placelessness, precarity and invisibility are experienced in virtual work and analyses the coping strategies used to generate trust by the employee in this context. Using a case study of a single worker who works remotely from the company, she shows how work and employment is negotiated in an informational-relational space. The concepts of community of practice and trust allow for analysing interactions in informational spaces which indicate that physical place remains a necessity for experiences of learning, identification and belonging. The contribution by Ryser, Angerer, Ganesh and Schulze addresses the collective expertise or competence required in globally distributed team working in order to cope with discontinuities and differences in understanding. On the basis of a survey of experts, they describe practices that are developed to actively overcome limita-

tions to cooperation. In this way, the chapter points out future requirements of competences for globally distributed co-creation. Roth-Ebner explores the interrelation between the mediatisation of work and phenomena of space and time on the basis of a mixed-method study on white-collar workers using ICT to different extents. Taking account of the space-constructing character of media, the contribution shows how the use of media at work changes and molds space, spatial perceptions and spatial behaviour and what the implications for the individual are.

References

Boes, A., & Kämpf, T. (2010). 'Offshoring and the new insecurities: Towards new types of 'white collar consciousness' in Germany in globalised working environments', *Work Organisation. Labour and Globalisation, 4*(1), 104–119.

Brenner, N. (2001). The limits to scale? Methodological reflections on scalar structuration. *Progress in human geography, 25*(4), 591–614.

Castells, M. (2010). Globalisation, networking, urbanisation: Reflections on the spatial dynamics of the information age. *Urban Studies, 47*(13), 2737–2745.

Coe, N. (2015). Labour and global production networks: Mapping variegated landscapes of agency. In K. Newsome, P. Taylor, A. Rainnie, & J. Bair (Eds.), *Putting labour in its place: The labour process and global value chains*. London: Palgrave Macmillian.

Graham, S. (1998). The end of geography or the explosion of place? Conceptualizing space, place and information technology Progress. *Progress in Human Geography, 22*(2), 165–185.

Harvey, D. (1982). *The limits to capital*. Oxford: Basil Blackwell.

Herod, A. (2008) 'Scale: The local and the global' in Valentine, C. & Clifford, N. (eds.), Key concepts in geography. (2nd) (London: Sage), 217–235.

Hess, M. (2004). "Spatial" relationships? Towards a reconceptualization of embeddedness. *Progress in Human Geography, 28*(2), 165–186.

Holtgrewe, U. (2014). 'New technologies: The future and the present of work in information and communication technology', *New Technology. Work and Employment, 29*(1), 9–24.

Huws, U. (2003). *The making of a cybertariat: Virtual work in a real world*. New York: Monthly Review Press.

Huws, U., Dahlmann, S., & Flecker, J. (2004). *Outsourcing of ICT and related services in the EU: A status report. Report for the European foundation for the improvement of living and working conditions*. Luxembourg: Office for Official Publications of the European Communities.

Huws, U. (2006). The restructuring of global value chains and the creation of a cybertariat. In C. May (Ed.), *Global corporate power: (Re)integrating companies into the international political economy* (pp. 65–82). Boulder: Lynne Rienner Publishers.

Kinsley, S. (2013). The matter of "virtual" geographies. *Progress in Human Geography, 38*(3), 364–384.

Latham, R., & Sassen, S. (Eds.) (2005). *Digital Formations—IT and New Architectures in the Global Realm*. Princeton, NJ: Princeton University Press.

Newsome, K., Taylor, P., Bair, J., & Rainnie, A. (Eds.) (2015). *Putting Labour in its Place—Labour Process Analysis and Global Value Chains*. London: Palgrave.

Parthasarathy, B. (2005). India's silicon valley or silicon valley's India? Socially embedding the computer software industry in Bangalore. *International Journal of Urban and Regional Research, 28*(3), 664–685.

Pries, L. (2008) *Die Transnationalisierung der sozialen Welt* (Frankfurt a. M.: Suhrkamp).

Sassen, S. (2007). *A Sociology of Globalization*. New York: W.W. Norton.

Schmiede, R. (1996) 'Informatisierung, Formalisierung und kapitalistische Produkti-onsweise. Entstehung der Informationstechnik und Wandel der gesellschaftlichen Arbeit' in Schmiede, R. (ed.) *Virtuelle Arbeitswelten. Arbeit, Produktion und Subjekt in der "Informationsgesellschaft"*, (Berlin: Edition Sigma), 15–47.

Swyngedouw, E. (1993). Communication, Mobility and the Struggle for Power over Space. In G. Giannopoulos & A. Gillespie (Eds.), *Transport and Communications Innovation in Europe* (pp. 305–325). London: Belhaven Press.

Taylor, P., D'Cruz, P., Noronha, E., & Scholarios, D. (2014). 'From boom to where?: the impact of crisis on work and employment in Indian BPO', *New Technology. Work and Employment, 29*(2), 105–123.

Part I

Delocalisation of Digital Work

2

The Production of 'Placelessness': Digital Service Work in Global Value Chains

Jörg Flecker and Annika Schönauer

Introduction

This chapter explores the spatial dynamics of value chains and networks, the delocalisation and relocation of digital work and the degree of its local embeddedness. The main aim is to argue that ICT-intensive business functions and jobs are not as such highly mobile or independent from place. Rather, such features are usually the result of lengthy restructuring and reorganisation projects or processes in which 'placelessness' is being produced. We examine value chain dynamics and the delocalisation and relocation of digital work, drawing on three cases: software development, shared service centres (SSC) and business process outsourcing (BPO), and crowdsourcing via online-platforms.

The concepts of value chains and global production networks are usually used to denote organisationally and/or spatially separated stages of entire manufacturing processes (Gereffi et al. 2005) ranging from research and development to the distribution of products. More recently, research has started to acknowledge the increasing externalisation and relocation of service functions and has shifted attention to the service sector. A trend towards the outsourcing and relocation of service functions, including

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front-office activities in customer service, high-end software development, and other divisible domains in business processes is clearly evident (Huws et al. 2004; Batt et al. 2009; Taylor 2010; Flecker and Meil 2010). Moreover, it has been suggested that financialisation accelerates such processes (Thompson 2013) because it puts pressure on companies to outsource and offshore activities to cut costs, increase revenues and enhance shareholder value.

Spatial aspects relate to different scales and levels of inquiry ranging from buildings, city quarters, cities and regions to nations, world regions and the globe. The dynamics include geographical relocation of digital work from one location to another, which may imply spatial centralisation of activities in a shared service centre, for example, or spatial dispersal to a large number of business units or individual crowdworkers within a country or around the globe. These spatial movements may remain within the organisation of a transnational corporation, for example, or they may at the same time cross organisational boundaries through outsourcing. Organisational spaces have always played an important role in the discussion of the dynamics of value chains understood as interfirm relations. Organisational and territorial spaces may be combined in various ways and often determine each other in organisational practices.

While various scales are pertinent, focus in these debates is often on the national level and on transnationalisation. 'Regime shopping' or 'institutional arbitrage' (Hall and Soskice 2001) are expressions for firms' strategies to shift their activities abroad in order to benefit from the advantages that the institutional frameworks of host countries might provide (Lane 2008), to capitalise on cheap labour and to get access to talent and skills. Crucially, the geographical dimension often overlaps with labour market and regulatory aspects. Consequently, the debate on global value chains, not only in manufacturing but also in services, focuses on the geographical dispersion of offshoring and tapping labour markets in low-cost countries. The geographical outcomes of restructuring processes clearly show that there is no such thing as an 'areal uniformity' (Graham 1998), that is regions having the same likelihood to attract jobs, as a consequence of the 'flattening of the world' through globalisation and advanced electronic networks. Rather, metropolitan areas in general and specific cities, urban districts or metropolitan regions (Castells 2010)

in particular, attract specific business functions. In this way, geographic clusters emerge in software development or the creative industries through the collocation of activities by a large number of companies. These clusters however are not stable. Rather, the international and interregional division of labour and the assignment of functions and tasks within corporate networks are highly dynamic.

Given the characteristics of IT and electronic networks, the delocalisation of ICT-enabled or 'digital' work is possible—'in principle'. However, we would argue that this does not mean that particular business functions such as software development, research and development (R&D), back office functions or particular types of work within these are as such 'placeless'. Although ICT and the internet can help to emancipate activities from place and diminish spatial and temporal barriers, every social and economic activity is geographical in that it is inscribed in space and 'takes place' somewhere. For example a communications line is the most important infrastructure for digital communication, it 'liberates actions from place and reduces the friction associated with distance and other space-sensitive barriers' (Swyngedouw 1993: 306). However communications lines can only liberate activities from their embededdness in space by 'producing new territorial configurations by harnessing the social process into a new geography of places and connecting flows' (ibid.: 306).

This means that in the process of liberation former territorial configurations are transformed, but not removed. In such processes, aspects of organisation, labour relations, technology and space are closely intertwined. 'The mobility of commerce, organisations, information and people does not make time and space irrelevant, rather, it highlights the extent to which these areas of experience have become more, not less, multi-layered, interrelated, and complex' (Ferguson 1992: 79). Places become increasingly shaped and constructed through their incorporation into powerful, corporate networks of flows and exchange (Graham 1998).

In addition, even ICT-enabled work itself is not independent from place. Paper files or archives, face-to-face communication, local tacit knowledge, access to physical artefacts, physical contact to customers and many other factors may make it territorially embedded. As a rule what is perceived as the 'placelessness' of digital work has been actively 'produced' in every single case through a process which may include the digitisation

of information, the codification of knowledge, the modularisation of business functions or the standardisation of tasks (Huws et al. 2004). Thus, digital work is not simply being delocalised. In the very same process it is usually being changed rather fundamentally. As a consequence, when analysing organisational and spatial restructuring we also need to take account of the changing character and quality of work.

Drawing on a literature review looking at theoretical and empirical findings about value chain dynamics and relocation of work in services this chapter explores the spatial dynamics of value chains and networks, the degree of local embeddedness of digital work and the social construction of space in different forms of collaboration of work. By doing so, it is going to highlight how, in particular restructuring processes, spatial, technological and organisational aspects are intertwined and what the consequences are for the changes in work.

The Mobility of Service Jobs and Tasks: Territorial and Organisational Spaces

In the following we are going to analyse service jobs as well as tertiary activities in manufacturing with regard to their mobility within geographical and organisational spaces. Position and mobility may relate to various scales. As far as territorial space is concerned these include, among others, buildings, cities, countries, continents or the globe. These different scales may be analytically separated but they are in fact connected together (Herod 2008) requiring a multiscalar approach to the analysis of labour processes (Coe 2015). In a second dimension we can conceptualise organisational spaces and thereby draw the distinction between establishments, business functions, companies, transnational corporations and global production networks.

Relating, first, to the dimension of territorial space, it is obvious that one prerequisite for outsourcing services and their distribution along a global value chain or a global service network is the possibility of splitting up and delocalising particular tasks or complete packages of business functions. Personal services performed interactively that demand co-presence and face-to-face delivery are place-bound and therefore difficult to

relocate. However, the availability of telecommunications incisively changed the nature of various kinds of service provision. Making use of the capability of telecommunication networks, including the internet, to transmit digitised information, even personal services involving interactive work can be carried out remotely and provided over a spatial and temporal distance (Huws et al. 2004: 5); examples would include customer service activities or online retailing.

Usually, customer contact is separated from other activities which can then more easily be delocalised. A good example is the split, or modularisation, between front- and back-office function in a service organisation (Dunkel and Schönauer 2008). The main facilitators for this are the codification of knowledge, that is making tacit knowledge accessible to others, the full digitisation of information, which allows for remote access to all information required for a task, and centralised information storage as well as workflow systems. These technological means enable both the spatial dispersal of organisationally integrated, formerly co-located tasks and the spatial centralisation of activities, such as customer service, back-office functions or software tests, after detaching them from a number of separated organisational units or individual firms. Communication technologies, such as telephone, e-mail, instant messaging or video-conferencing, further support spatially distributed collaboration. Overall, the enabling capabilities of ICT may weaken the need for co-presence of co-workers and customers, for face-to-face communication, for local experience and tacit knowledge and for the physical availability of documents or artefacts—all included in the term 'place'. Using Information and Communication Technologies may thus enable a reconfigurations of space at various scales—from 'hot desking' within a workplace to the collaboration of truly global virtual teams. However, to what extent work is actually delocalised as a rule depends on organisational change and work design rather than the capabilities of technology (Ibrahim 2012).

In addition to, and intertwined with, the mobility of service or tertiary activities within territorial space we, secondly, observe an accelerated dynamic of organisational spaces. Complete generic business functions such as software development, customer services, creative and content-generating functions including research, development and design, financial functions and logistics (Huws et al. 2004), to be found in all

sectors, may be subject to organisational outsourcing—and sometimes insourcing. Within business functions, the modularisation of service delivery may be developed further with certain modules or stages of a service provision process taken care of by different units along the value chain or within a network. This is most common in immaterial production of, say, software but also holds true for the separation of front-office and back-office tasks in various industries and in the public sector.

Value chains as interfirm relations (Gereffi et al. 2005) are the result of the vertical disintegration of corporations through outsourcing. As a consequence, functions or tasks are distributed within production networks to various firms assuming that 'some functions in the chain are performed better by external independent contractors than within hierarchically integrated firms' (Lane 2008). The inter-firm relationship and, in particular, the contractual and power relations between the core firm and its suppliers or service providers assume great significance for the labour process. Contracts between companies, such as service-level-agreements (SLAs) are not only a way to make a company's performance in service delivery predictable and verifiable; they are also the core of the management control system (Taylor 2010). In parcel delivery, for example, a small number of transnational logistics companies not only dominate the market but also control the labour processes in their subcontracting chains, thereby placing extremely high flexibility demands on informalised workers on the bottom end of the chains (Haidinger and Flecker 2015)

The two dimensions, organisational and territorial space, may be combined in various ways and at different scales. Often, particular service functions or tasks are detached from the departments, establishments or firms where they had been carried out, in order to be organisationally and spatially centralised within a group of companies. Such a centralisation and, in particular, the restructuring preparing it, render the service function amenable to outsourcing it to a service provider company. This lengthening of value chains across organisational boundaries if an organisation outsources a certain activity to a service provider, does not necessarily have spatial implications in the sense of a relocation of the activity. For example, IT workers may change their employer through

outsourcing of IT services but continue working on the premises of their former employer. This is a frequent constellation which results in a particular multi-employer setting (Marchington et al. 2005) without necessarily bringing spatial distance into the service activities.

However, organisational change, such as centralisation or outsourcing of services, also supports the delocalisation of work through the modularisation of functions or tasks, the resulting reduction of interdependencies, the standardisation and increasing ICT-intensity of work processes and by establishing procedures for the control and monitoring of units for example through SLAs (Dunkel and Schönauer 2008; Taylor 2010; Feuerstein 2013). Central service departments—from IT to call centres—may be subject to locational decision-making so that management may use the particular advantages of specific locations for a service function. Outsourcing may influence the spatial distribution of work not only because the whole of the activities may be moved to a different region or country as in nearshore or offshore outsourcing, service providers may also separate and relocate some of the tasks, such as programming or helpdesks in the case of IT services, while they may keep other activities in the same place (Flecker 2008). Often, the result is a complex and rather dynamic interrelation of organisational and territorial spaces.

Restructuring of Service Activities

The following examples from software development, shared service centres and business process outsourcing and crowdsourcing via online-platforms are examples of spatial relocation in the sense of both spatial centralisation and dispersal. They illustrate the dynamics between organisational and territorial spaces and give an insight into the preconditions for distributed working and collaboration over distance. Delocalised service work or work in tertiary functions often has a long history of restructuring through which, step by step, functions and tasks have been made amenable to delocalisation. Nevertheless there are limitations and companies may find it challenging or even impossible to relocate work although such work may in principle be independent from place and can be done anywhere with the use of ICT.

Software Development

Among 'tertiary' activities, software development has been subject to relocation for several decades and was a prominent example of the offshoring boom in the 1990s and early 2000s. There are a few reasons for this. Firstly, the fully digital product makes digital delivery possible. Secondly, software development includes a wide range of activities, part of which may be singled out to be carried out remotely (Flecker and Meil 2010). Thirdly, there is a high degree of standardisation of both technologies and knowledge and training at a global scale facilitating a relocation of activities (Huws 2006). Fourthly, large corporations in the industry operate internationally and therefore find it easier to use different labour markets for their various activities.

Initially, a clear division of labour prevailed with so-called low-level processes being targeted for outsourcing and relocation: writing code in accordance with clear specifications, customising systems, adding functionality to existing software or testing it (Flecker and Meil 2010). India attracted software activities on a large scale both in the form of foreign direct investment by international corporations and as offshore-outsourcing services provided by specialised domestic firms. The rise of the Indian IT industry was based on a combination of low labour costs and high skills of a large number of IT workers. The success, however, also resulted in negative feedbacks as many firms experienced high levels of personnel turnover as workers took advantage of the opportunities offered by the continually expanding labour market to increase their wages or to find better learning and advancement opportunities by moving between firms. Further, many Indian IT workers were particularly interested in improving their skills and thus were discontent with the low-level tasks often assigned to them. Differences in company responses resulted in contingent modes of work organisation and restructuring of value chain relations with different types of outsourced work and different outcomes for workers in remote locations. One company reaction to cope with attrition may be to further standardise work in order to keep workers replaceable, while another reaction lies in upgrading software activities in India, moving higher-level tasks or full projects to their subsidiaries there (Feuerstein 2013). The standardisation

and degradation route may result in even higher personnel turnover: 'When employees are not required to have any special application knowledge beyond programming, they can easily and freely move between firms that make no such demands' (Parthasarathy 2005: 677). In contrast, while the upgrading route may lead to more staff stability it is likely to increase labour costs.

The offshoring of IT activities has resulted in a changed international division of labour with India, Russia or, more recently, China becoming important centres for software development. The more companies tap the particular local labour market to benefit from the skills and the relatively low labour costs the more likely becomes a competition for workers between companies and enhanced opportunities for workers to change employer and to improve their bargaining position. As a consequence, in their search for low labour costs and skilled workers, companies considered moving to other countries (Holtgrewe and Meil 2007).

The example of software development shows that as a consequence also the actual work is changing. The modularisation, standardisation and formalisation of functions, tasks and work have frequently been observed. While some researchers equate internationalisation with industrialisation of software development work (Boes and Kämpf 2010), others point to the variety of management strategies ranging from intensified division of labour resulting in small, circumscribed and standardised tasks on the one hand, to the assignment of large modules or sub-projects as 'black boxes' (Huws et al. 2009; Feuerstein 2013). Yet, whatever the company strategies are, they are, at least in part, a reaction to the implications of geographical distance in work processes and to the consequences of particularities of local labour markets and related labour agency. In spite of high degrees of digitisation of information, work objects and tools, many years of experience with distributed working and the availability of advanced technology to support it, software development as such is still not a 'placeless' activity. Rather, each case is characterised by particular strategies of delocalisation which result in different characteristics of work.

The limits to relocation of software development could be observed in a case study on an IT start-up for the development of a smartphone application (Schönauer et al. 2013). For the development project the founders of the small company employed expert freelancers in different

world regions they had had business contacts with before. As the development work was not modularised enough and the plans were changed rather frequently, the distributed development process was not working, although the work was kept in-house as far as the organisational space was concerned. The company had to start anew with new staff and to make sure that the developers were present at the company's office at least during three days a week.

Generally, there are doubts about the 'placelessness' of software development and especially R&D work in IT: One argument relates to the importance of informal, unplanned and ad-hoc communication that is needed to support collaboration. Production of 'placelessness' then aims at designing and assigning work in such a way that the amount of the required informal communication is reduced (Grinter et al. 1999). Distance can negatively impact on virtual teams because of limitations to trust-building, problems with access to colleagues in case of task interdependence or incomplete communications and misunderstandings (Bailey et al. 2011). Strategies to overcome such limitations may deepen modularisation, they may rely on intensifying standardisation and they may use people's mobility and communication technology to improve the conditions for spatially distributed collaboration.

Shared Service Centres and Business Process Outsourcing

Next to software development, business process outsourcing was a major trend in the offshoring movement in particular to India. Customer services, payroll administration, accounting and other functions were subject to relocation and spatial centralisation in order to reduce labour costs (Flecker and Kirschenhofer 2002). Prior to outsourcing, such activities were centralised within establishments and companies and thereby 'business functions that were previously dispersed across departments are brought together within one location' (Howcroft and Richardson 2012: 113). This separation and centralisation may result in the organisation of back-office functions in shared service centres within a company or a group of companies. Once such modularisation is achieved, the outsourcing to an external service-provider company is also feasible.

The establishment of shared service centres and the outsourcing of entire business processes is heavily based on, and enabled by, ICT. These not only provide common technology-platforms and workflow systems, they also facilitate modularisation of activities and the codification of knowledge—both important preconditions for organisational restructuring and outsourcing. In addition, ICT supports both the centralisation and the decentralisation of tasks within an organisation and beyond organisational boundaries. What is more, ICT is indispensable for bridging spatial distance by allowing remote data entry and retrieval, establishing automated workflows and providing communication functions.

Taylor and Bain (2004: 137) point to the example of call centres showing that while technology separates call centre agents geographically in networked organisational spaces; these are still tightly bound in processual terms and closely connected technologically. This relates both to the functional integration of spatially dispersed activities and to the monitoring of workers. An overview of developments in the Indian BPO sector at large shows that 'employees report pressurised work routines, strict managerial control and demanding targets rooted in constrictive SLAs' (Taylor et al. 2014). Another interesting aspect in the process of production of placelessness is what Ibrahim calls the 'masking of location during a call, where call centre workers are required to hide their geographical location' (2012: 32). This veiling of location goes so far that employees have to pretend to be somewhere else while they make small talk with customers on the phone. Via the internet they are, for example, well informed about the weather forecast, the results of the latest soccer game and of course the local time at a place on the other side of the world. While service centres tendentially try to hide where they are located, other providers of service activities may emphasise their territorial place. In IT, for example, to be located in Silicon Valley may enhance one's reputation.

The main management motive for the establishment of shared service centres is the aim to cut costs through economies of scale. In addition, the possibility to delocalise such centres offers opportunities to cut labour costs: 'Centralisation of previously dispersed back office work is crucial to the generation of scale economies; hence many centres become large-scale sites that are decentred from the core and relocated to geographies

characterised by supplies of inexpensive skilled labour, often in poorer regions in the home country or in developing countries' (Howcroft and Richardson 2012: 114f.).

As a rule, external restructuring and relocation require the modularisation of functions, the codification of knowledge and the standardisation of tasks and interfaces (Huws et al. 2009). This means that work is being changed considerably in that process. For Howcroft and Richardson standardisation is key to the understanding in particular of the restructuring of back-office functions and the establishment of shared service centres. Only through the standardisation of tasks, skills and processes can individuals and locations become 'calculable, marginal and substitutable in the performance of this work' (Howcroft and Richardson 2012: 124). 'Given the continual flux in the SSC sector, the standardisation of tasks and skills, mediated by technology, is key to the achievement of a semblance of stability, enabling work to be lifted out of traditional organisational structures and placed elsewhere or outsourced to other service providers' (ibid.). This is not as trivial as it may look on first sight and it never was. Already Flecker and Kirschenhofer (2002) described their analyses of a case of outsourcing and relocation of data entry work from Austria to India. An airline had decided to use cheaper labour for the input of data that was printed on boarding passes to the information system. While the tasks seemed to be rather clearly defined it was nevertheless necessary to prepare the reorganisation in a six-month project and to develop a new handbook for the business process. During this preparatory work it turned out that the tacit knowledge needed for the task of data entry had been underestimated. Knowledge of city names, airport codes and currencies was required to be able to avoid, and to spot, data entry mistakes. Both outsourcing and geographical relocation to a different continent were therefore more challenging than expected.

Crowdsourcing via Online-Platforms

A rather recent development in the restructuring and spatial redistribution of work has been termed 'crowdsourcing' via online-platforms and can be described as a form of delocalising work. Barnes et al. (2013)

define paid crowdsourcing as 'an internet-enabled exchange through which individuals (the workers, supply-side) can seek paid employment and organisations (the employers, demand-side) can reach a larger pool of workers to outsource tasks by utilising online intermediaries or vendors (those providing an online platform in which tasks are advertised)'. Howe (2006) defined crowdsourcing as 'the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call'. Crowdsourcing and crowdemployment usually involve the services of labour market intermediaries who run online-platforms (e.g. Elance.com, Amazon Mechanical Turk, 99designs) on which jobs can be advertised and workers may post their profiles. There are platforms which assign jobs to certain workers who are paid per hour or who get a flat-rate for their work. But there also exist competition-based platforms, such as 99designs, where workers submit (almost) completed work and are chosen (or not) by the employer. This leads to a situation where most participants who submit work remain unpaid.

Characteristic of online-outsourcing is that the call, the performance of the tasks and the delivery of the results are carried out online, usually over the internet. The 'crowd' addressed by the calls is typically an undefined, large and heterogeneous group of potential contract partners access to whom is made possible through the internet. As a consequence, this group is usually not geographically defined. Rather, it is open as to who among a potentially global workforce responds to a call and then enters into a contractual relation.

Initially, the main interest in crowdsourcing focused on the outsourcing of micro-jobs that require no special skills on the part of the workers. Categorising the content of pictures or videos is a good example of such 'human intelligence tasks' as they are called by Amazon Mechanical Turk (Lehdonvirta and Ernkvist 2011). More recently, crowdsourcing is increasingly used by international corporations for more highly skilled work and more demanding projects (Barnes et al. 2013: 20).

For employers the advantages of crowdsourcing lie in facilitating access to a global pool of workers who can be flexibly deployed, in the efficient and quick completion of tasks, the easy termination of the employment relation and the low labour costs (Felstiner 2011: 151f.). Therefore,

crowdsourcing promises numerical and functional flexibility at low costs as well as the potential access to new knowledge. However, disadvantages for employers relate to insecurities regarding the skills of workers and problems over the control of work, the monitoring and evaluation of which is seen as costly and cumbersome (ibid.). Not all types of work are amenable to crowdsourcing. According to Afuah and Tucci, quoted by Leimeister and Zogaj (2013: 33), the tasks must be easy to describe and to modularise and the addressed crowd should be knowledgeable and motivated.

Complex value chains with possibly several layers of companies have emerged to facilitate crowdsourcing (Lehdonvirta and Ernkvist 2011). In addition to the client organisation outsourcing and delocalising work and to the crowdsourcing platform organising the tenders, the contracts, the self-presentation of the participants, etc. there are intermediaries who, for example, restructure the work to make it amenable to crowdsourcing. In this process, a high degree of 'placelessness' can be reached often allowing workers to access the tasks from anywhere in the world. However, the global reach of this particular form of outsourcing is far from certain. With the possible exception of English language platforms many crowdsourcing intermediaries are assumed to have so far operated mainly within national boundaries (Mandl 2014). And Amazon Mechanical Turk, that is mostly asking for culture-free 'human intelligence tasks', is interestingly not operating on a global scale. Rather, because of payment procedures it limits itself to the US and India (Lehdonvirta in this volume).

Conclusions: Geographies of Service Value Chains

In this chapter, we have argued that work is being reconfigured simultaneously in organisational and territorial spaces. The lengthening of service value chains has been reflected as 'the emergence of a flexible service economy [that] could be regarded at least in part as a manifestation of organisations' outsourcing strategies' (Rubery 2006: 6). In such an economy, an increasing number of workers are no longer directly employed by the

organisation where and/or for whom they work but by third party firms subcontracted by the lead firm. Outsourcing or subcontracting service functions and tertiary activities often result in fragmented employment relations and working conditions (Meil 2009; Flecker 2010). Companies and their affiliates offer diverse job contracts with different wage levels and conditions of work, and redistribute work tasks within one company or across more companies, according to flexibility requirements and the possibilities offered by their respective institutional environments. By way of subcontracting, companies may tap particular segments of labour market to cut labour costs, to increase flexibility and to access special skills.

These processes of segmentation and fragmentation of employment (Flecker 2009) are facilitated and deepened by relocation of work either through centralisation, for example shared service centre, or dispersal, for example crowdsourcing. This may happen at various scales between the local and the global levels. As far as the transnational scale is concerned, the outsourcing across regional, national and continental boundaries often aims at escaping institutional constraints in the company's home country and seeking alternative institutional arrangements. In their search for advantages companies may focus on labour costs but they may also look for highly skilled workers, numerical flexibility or lax working hours' regulation. While national borders keep workers divided, the spatial division of labour also relates to different ways and degrees of territorial embeddedness of both capital and workers (Rainnie et al. 2010).

ICT plays a crucial role both in organisational and spatial restructuring, facilitating the outsourcing and relocation of jobs. However, not all ICT-enabled work is amenable to delocalisation. Rather, the 'placelessness' of digital work has to be actively 'produced' in organisational restructuring processes. As a consequence, there is a close link between spatial relocation of work, the design of the labour process and the quality of work.

Our short overview of developments in selected service functions showed that in terms of space, place and geography, the restructuring processes do have some aspects in common. These relate, firstly, to particular geographic outcomes of restructuring processes which clearly show that there is no such thing as an 'areal uniformity' (Graham 1998) triggered by advanced electronic networks. Rather, metropolitan areas in

general, and particular locations, attract specific business functions. In software development and in the creative industries geographic clusters emerge through the collocation of activities by a large number of companies. Yet the geographies of 'placeless' service work and the resulting international division of labour are highly dynamic because the production of 'placelessness' facilitates further relocation as firms arbitrage costs across space.

A second spatial aspect of service value chains relates to the characteristics of business locations and in particular to local labour markets. Availability of labour and skills, wage levels and labour market regulation influence the ability of localities to attract capital investment and outsourced service jobs. As a consequence, labour market regulation, wages and terms and conditions become variables in strategies of regional development and national economic policy. The competition for jobs easily results in a race to the bottom, not only in the global garment industry but also in the field of service activities. Poland, for example, legalised work on Sundays and public holidays in shared service centres in 2014 in order to keep its position in that market and to attract further business process outsourcing (Balicki 2014). This clearly shows that the dynamics of service value chains and the restructuring of tertiary activities need to be analysed with a view to the 'power geometry of time-space compression' (Massey 1994), with some of the actors benefiting from, and others being detrimentally affected by, the enhanced mobility of jobs and tasks.

Thirdly, the examples show that organisational, technological and spatial dynamics are closely intertwined. Organisational restructuring is a necessary precondition for the relocation of activities. Business functions and tertiary activities are being modularised, digitised, and IT-based in order to become amenable to outsourcing and relocation. Work is frequently changed considerably and often becomes more standardised in the preparation for, and as a consequence of, organisational and spatial separation. The processes may start with organisational restructuring and then open up opportunities for management to relocate work and to change the spatial division of labour. Delocalisation may also be the starting point and then result in far-reaching organisational change.

Overall, we can conclude that the mere existence and use of computers and electronic networks does not imply that work enabled and supported by ICT becomes 'placeless'. Rather, restructuring and work design play a crucial role which may result in far-reaching changes in work. Higher levels of division of labour and standardisation of work may be the outcome. However, this is not necessarily the case. Based on modularisation of service activities the result may also lie in holistic types of 'subjectivised' work requiring high levels of skills and affording wide discretion. This means that general tendencies of rationalisation and work design pointing in two different directions seem to be accelerated and deepened by the 'production of placelessness' of digital work.

References

Bailey, D., Leonardi, P., & Barley, S. (2011). The lure of the virtual. *Organization Science, 23*(5), 1485–1504.

Balicki, M. (2014) Poland: Amendment to the labour code: Additional possibilities to assign work on Sundays and holidays. *Lexology.* http://www.lexology.com/library/detail.aspx?g=3d556c47-582f-494d-84b1-051c25bc8607

Barnes, S.-A., de Hoyos, M., Baldauf, B., Behle, H. & Green, A. (2013) *D2*: *Review of state of the art and mapping*: *CROWDEMPLOY*. Seville: JRC Institute for Prospective Technological Studies. Online available at: http://is.jrc.ec.europa.eu/pages/documents/ICT4EMPLCrowdemploymappingforweb.pdf

Batt, R., Holman, D., & Holtgrewe, U. (2009). The globalization of service work: Comparative institutional perspectives on call centers. *Industrial & Labor Relations Review, 62*(4), 453–488.

Boes, A., & Kämpf, T. (2010). Offshoring and the new insecurities: Towards new types of 'white collar consciousness' in Germany in globalised working environments. *Work Organisation, Labour and Globalisation, 4*(1), 104–119.

Castells, M. (2010). Globalisation, networking, urbanisation: Reflections on the spatial dynamics of the information age. *Urban Studies, 47*(13), 2737–2745.

Coe, N. (2015). Labour and global production networks: Mapping variegated landscapes of agency. In K. Newsome et al. (Eds.), *Putting labour in its place* (pp. 171–192). London: Palgrave Macmillan.

Dunkel, W., & Schönauer, A. (2008). Reorganising the front line: Customer service in the public sector. In J. Flecker, U. Holtgrewe, A. Schönauer, W. Dunkel, & P. Meil (Eds.), *Restructuring across value chains and changes in*

work and employment. Case study evidence from the clothing, food, IT and public sector, *WORKS WP 10 Deliverable 10.1* (pp. 107–136). Leuven: (online). http://www.worksproject.be/Subgroup_3_proj_reports.htmHIVA.

Ferguson, M. (1992). The mythology about globalization. *European Journal of Communication, 7*(1), 69–93 (online) http://www.uk.sagepub.com/mcquail6/Online%20readings/10d%20Ferguson.pdf.

Felstiner, A. (2011). Working the crowd: Employment and labor law in the crowdsourcing industry. *Berkeley Journal of Employment & Labor Law, 32*(1), 143–203.

Feuerstein, P. (2013). Patterns of work reorganization in the course of the IT industry's internationalization. *Competition & Change, 17*(1), 24–40.

Flecker, J. (2008). Going private—IT service outsourcing in the public sector. In J. Flecker, U. Holtgrewe, A. Schönauer, W. Dunkel, & P. Meil (Eds.), *Restructuring across value chains and changes in work and employment. Case study evidence from the clothing, food, IT and public sector* (pp. 83–102). Leuven: HIVA.

Flecker, J. (2009). Outsourcing, spatial relocation and the fragmentation of employment. *Competition & Change, 3*(3), 252–268.

Flecker, J. (2010). ´Fragmenting labour: Organisational restructuring, employment relations and the dynamics of national regulatory frameworks´. *Work Organisation, Labour and Globalisation, 4*(1), 8–23.

Flecker, J., & Kirschenhofer, S. (2002). Jobs in the move: European case studies in relocating eWork, IES report 386, Brighton: Institute for Employment Studies.

Flecker, J., & Meil, P. (2010). Organisational restructuring and emerging service value chains—implications for work and employment. *Work, Employment & Society, 24*(4), 1–19.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of International Political Economy, 12*(1), 78–104.

Graham, S. (1998). The end of geography or the explosion of place? Conceptualizing space, place and information technology Progress. *Progress in Human Geography, 22*(2), 165–185 (online) http://phg.sagepub.com/content/22/2/165.full.pdf+html.

Grinter, R. E., Herbsleb J. D. & Perry D. E. (1999). *The geography of coordination: Dealing with distance in R&D work*. GROUP '99 Proceedings of the international ACM SIGGROUP conference on supporting group work, 306–315.

Haidinger, B., & Flecker, J. (2015). Positioning labour in service value chains and networks – the case of parcel delivery. In Ph. Taylor et al. (Eds.): *Putting Labour in its Place: The Labour Process and Global Value Chains*. London, New York: Palgrave Macmillian, 64–82.

Hall, P. A., & Soskice, D. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford University Press: Oxford.

Herod, A. (2008). Scale: The Local and the global in Valentine. In N. J. Clifford, S. L. Holloway, S. P. Rice, & G. Valentine (Eds.), *Key concepts in geography* (2nd ed., pp. 217–235). London: Sage.

Holtgrewe, U., & Meil, P. (2007). Bringing research to the market: IT Research and Development. In J. Flecker et al. (Eds.), *Restructuring across value chains and changes in work and employment*. Leuven: HIVA.

Howcroft, D., & Richardson, H. (2012). The back office goes global: Exploring connections and contradictions in shared service centres. *Work, Employment and Society, 26*(1), 111–127.

Howe, J. (2006). The rise of crowdsourcing. *Wired Magazine, 14*(6), 1–5.

Huws, U. (2006). The restructuring of global value chains and the creation of a cybertariat. In C. May (Ed.), *Global corporate power: (Re)integrating companies into the international political economy* (pp. 65–82). Boulder: Lynne Rienner Publishers.

Huws, U., Dahlmann, S., & Flecker, J. (2004). *Outsourcing of ICT and related services in the EU: A status report. Report for the European foundation for the improvement of living and working conditions*. Luxembourg: Office for Official Publications of the European Communities.

Huws, U., Dahlmann, S., Flecker, J., Holtgrewe, U., Schönauer, A., Ramioul, M., et al. (2009). *Value chain restructuring in Europe in a global economy*. Leuven: HIVA.

Ibrahim, Y. (2012). Temporality, space and technology: Time-space discourses of call centres. *New Technology, Work and Employment, 27*(1), 23–35.

Lane, C. (2008). National capitalism and global production networks: An analysis of their interaction in two global industries. *Socio-Economic Review, 6*, 227–260.

Lehdonvirta, V., & Ernkvist, M. (2011). *Knowledge map of the virtual economy*. Washington, DC: World Bank.

Leimeister, J. M. & Zogaj S. (2013) *Neue Arbeitsorganisation durch Crowdsourcing. Eine Literaturstudie* (No. 287, Düsseldorf).

Mandl, I. (2014). *New forms of Employment. Status quo and first findings on crowd employment and ICT based mobile work*. Presentation on the Working Group Meeting of COST action IS1202, 28 March 2014, Bucharest.

Marchington, M., Grimshaw, D., Rubery, J., & Willmott, H. (Eds.) (2005). *Fragmenting work: Blurring organizational boundaries and disordering hierarchies*. Oxford: Oxford University Press.

Massey, D. (1994). *Space, place and gender*. Minneapolis: University of Minnesota Press.

Meil, P. (2009). Value chain restructuring and its effects on the employment relationship and working conditions´ in P. Meil (ed.) *Challenges for Europe under value chain restructuring* (pp. 11–27). Leuven: HIVA.

Parthasarathy, B. (2005). India's silicon valley or silicon valley's India? Socially embedding the computer software industry in Bangalore. *International Journal of Urban and Regional Research, 28*(3), 664–685.

Rainnie, A., McGrath-Champ, S., & Herod, A. (2010). Making space for geography in labour process theory. In P. Thompson & C. Smith (Eds.), *Working life. Renewing labour process analysis* (pp. 297–315). Hampshire: Palgrave.

Rubery, J. (2006). *Segmentation theory thirty years on*. European work and employment research centre, University of Manchester

Schönauer, A., Kasper, R., Flecker, J., & Holtgrewe, U. (2013). Forced to go virtual? Distributed cooperation of small software firms. *Work Organisation, Labour and Globalisation, 7*(1), 63–75.

Swyngedouw, E. (1993). Communication, mobility and the struggle for power over space. In G. Giannopoulos & A. Gillespie (Eds.), *Transport and communications innovation in Europe* (pp. 305–325). London: Belhaven Press.

Taylor, P., & Bain, P. (2004). Call centre offshoring to India: The revenge of history? *Labour and Industry, 14*(3), 15–38.

Taylor, P. (2010). The globalization of service work: Analysing the transnational call centre value chain. In P. Thompson & C. Smith (Eds.), *Working life. Renewing labour process analysis* (pp. 244–268). Hampshire: Palgrave.

Taylor, P., D'Cruz, P., Noronha, E., & Scholarios, D. (2014). From boom to where?': The impact of crisis on work and employment in Indian BPO. *New Technology, Work and Employment, 29*(2), 105–123.

Thompson, P. (2013). Financialization and the workplace: Extending and applying the disconnected capitalism thesis. *Work Employment & Society, 27*(3), 472–488.

3

New Topologies of Work: Informatisation, Virtualisation and Globalisation in Automotive Engineering

Mascha Will-Zocholl

Introduction

In current debates about the future of work and organisations, digitisation and virtualisation move to centre stage. The terms 'Digital Revolution' (Rifkin 2011) or 'Second Machine Age' (Brynjolfsson and McAfee 2014) equates the ongoing changes with those of the industrial revolution. In 'Digital Capitalism' (Schiller 2000) or 'Cognitive Capitalism' (Moulier-Boutang 2012), the internet of things, Weiser's (1991) foresighted vision, is becoming true much sooner than expected. Regarding a future of 'virtual realities', or 'real virtualities' as Castells (1996) emphasises, place does not seem to be of any interest. The spread of the internet nourished the idea that time and place (of work) would no longer matter. New topologies emerge, which demand a rethinking of notions of space and place. This paper reflects on empirical evidence of automotive engineering to draw a picture of these new topologies of work. Engineering work is facing crucial changes as a new phase of informatisation has been entered through the development of digitisation and virtualisation techniques and the use of information and communication technologies (ICT). Collaborative engineering methods are being increasingly applied and

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global engineering seems to be a reachable goal. Engineering is expected to be becoming spatially flexible: any time—any place. The empirical findings to be presented are based on two empirical research projects in automotive engineering.[1] Four case studies have been conducted using document analysis and more than 40 guided qualitative interviews with experts in engineering management and engineers at the operational level in engineering centres or units. In summary, we found heterogeneous strategies to deal with the challenges of global competition and the financial crisis. The case companies try to enhance their global strategies, intensify the international division of labour in engineering and focus more on processes than on products. The aims of the companies could be characterised as locally-bounded and globally distributed at the same time, where globally distributed means within the same company and focused on nearshore locations. Consistent changes in automotive engineering have ongoing implications for the product development process and engineering work in the context of informatisation, digitisation and virtualisation. We find changes in work organisation, work content and the status of engineers, and tendencies of relocating work. Before presenting the empirical findings some thoughts on the differentiation of space and place will be put forward to demonstrate why we need a clear understanding of both and how these terms were used. The differences between and meanings of the terms: informatisation, digitalisation and virtualisation will also be clarified. These terms can be regarded as the central references of this paper and crucial to understanding the current changes in work and organisations.

Spatial Dimensions of Informatisation

In the late 1980s during the spatial focus in human geography, Harvey (1989) tried to explain the new relationship between time and space with the term 'time-space compression'. A closely related idea has also been

[1] 'Knowledge work in automobile engineering—topology of its reorganization' (2006–2010) founded by the DFG (German Research Foundation) and 'TRUST Teamwork' (2009–2013) financed by the BMBF (German Federal Ministry of Education and Research) and the ESF (European Social Fund) (2009–2013).

introduced by Giddens (1984) as 'time-space distanciation'. The temporal distances were diminished by faster means of transportation, especially the use of airplanes, as a consequence territorial distances 'shrank'. Decades later, the use of modern information and communication technologies enabled a completely new dimension of 'time-space compression' as it is presented, for example, in Friedman's (2005) entertaining (but not dissatisfying in terms of scientific approaches) bestseller *The world is flat*. The debate about new spatial and temporal fixes (see Jessop 2006) promoted the differentiation between space and place, emphasising that the changes go beyond traditional geographical orders. Furthermore, space is no longer discussed as a built environment or separated territories where the presence of bodies or measurable distances creates spaces. It is, rather, a relational phenomenon: the position of an individual refers to the position of others (Löw 2013). Those Social spaces are produced by social practices (Lefebvre 1991). In this understanding space(s) emerge through the interaction of people which is not limited to national borders, virtual work environments or social networks. Following the perception that space is produced or constituted by social practices, it is never free of power. Structures of power were enrolled by the relations emerging in the space. Relations matter more than positions in these concepts of space.

As a consequence information space(s) emerge through the use of ICT by the action of (real) people. Following Boes and Kämpf (2007) this information space[2] is a space of production where value is added. People work on an object together. Different places and locations of firms or regions can be integrated in the information space through the people 'doing' in this social space. Thus the outcome of information spaces is not limited to the distribution of nearly all kinds of work (for service work, for example, see: Flecker and Huws 2004; Aspray et al. 2006; for IT-service and software-engineering, see: Boes and Kämpf 2010; Hardy and Hollinshead 2011; Mayer-Ahuja 2014). An intensification in the division of labour shows up in terms of outsourcing, nearshoring and offshoring as well as crowdsourcing and cloudworking environments. Work seems to be organised flexibly and somehow de- and relocalised at the same time. As a consequence of the distributed work organisation, the need for cooperation

[2] The authors refer to the information space in singular.

and for physical mobility are increasing, despite online communication and virtual working environments. Furthermore, the constitution of information spaces could be regarded as the achievement of a new phase in the informatisation process. As informatisation is more than the ubiquitous spread of ICTs and its interfaces, today's use of ICTs and the reorganisation of time and place through the information space mark a crucial change. More generally, 'informatization is […] to be understood as a socio-historical process of conscious, systematic handling of information, especially including generation and use of information and information systems' (Boes and Kämpf 2007: 197). Informatisation is closely connected to the development of capitalist societies, starting with a rationalisation of the use of information in large companies, leading to—as Rudi Schmiede (1996 and 2006) called it—'a structural duplication' of the material working processes. This abstraction allows controlling and regulating of even complex organisations. The handling of information gained more and more importance over time and has never been as important as it is today. This development has been accelerated by computerisation during the 1980s and 1990s, but digitisation and a worldwide ICT infrastructure formed the basis for new spatial dimensions of informatisation (Boes and Kämpf 2007). At this point, it is important to clarify that informatisation could be regarded as a meta-process that has occurred since the development of the double-entry bookkeeping[3] as important so-called information technology. It can not be reduced to the use of personal computers or computerisation and digitisation taking place nowadays. Digitisation, as a further informatisation step, is, following Bailey et al. (2012: 1485f.), the computer-based representation of entities (objects and processes), while virtualisation represents or substitutes entities (physical and digital ones) in their appearance and functionality (Will-Zocholl 2016).[4] These differences are important to understanding how engineering has become virtual and the implications for the reorganisation of work.

[3] As can be read in the recently published book by Gleeson-White (2013) where she explains how double-entry-bookkeeping changed the capitalist economy.

[4] Virtuality could also be understood more generally as abstraction of real things like symbols that are used instead of real entities, as Castells (1996: 372) refers to as 'real virtualities' instead of 'virtual realities' .

Methodological Approach, Field of Research and Sample Enterprises

Data Collection and Sample Enterprises

Empirically, the research is based on four case studies of automotive engineering companies in Germany and pursues a predominantly qualitative approach (Pongratz and Trinczek 2010). Beside the analysis of statistical data and documents such as annual reports and organisation diagrams, more than 40 qualitative guided interviews targeting engineers were conducted and recorded digitally, then transcribed and analysed with a qualitative content analysis approach (Mayring 2002). Engineers at several levels of the enterprise hierarchy were interviewed—from engineers at the operational level and engineering managers up to department and division management level. The interviews were conducted in the period between November 2006 and December 2010 (Will-Zocholl 2011). The interviewees were working in the development and product development departments of two Original Equipment Manufacturers (OEM), here referred to as called MassCar and PremCar, as well as at two engineering centres of a system supplier (referred to as FirstTier1 and FirstTier2). Each of these companies employs between 5000 and 8500 engineers in car development processes. Their engineering departments—especially the core areas such as design, prototyping, and engineering processes and strategies—were selected to investigate general issues of engineers' work and to point out striking developments in the different types of companies.

All companies under study (see Table 3.1) were involved in permanent reorganisation processes. Both OEMs outsource their engineering to a high degree, whilst FirstTier1 and FirstTier2 do so to a lower degree. While MassCar has the opportunity to distribute work among the captive engineering centres around the world in the US, Korea, Australia, China and so on, PremCar relies almost completely on its partners along the value chain—beside an engineering centre in India. The two suppliers use nearshoring strategies by establishing their Eastern European subsidiaries. Temporary employment also plays an important role, especially

Table 3.1 Companies under study

Case study	Type and size of business	Type of service value chains and central dynamics
MassCar	American-based OEM	Global engineering network characterised by 'coopetition', subsidiary in India
PremCar	German Premium Car OEM	Central engineering site in Germany, direct offshoring to a small extent to an Indian subsidiary
FirstTier1	A large German-based system supplier	German location as headquarters of engineering activities, subsidiaries all over the world. The German location faces intensified outsourcing to nearshore locations in Eastern Europe
FirstTier2	A medium-sized German system supplier	Centrally organised engineering at the German site, outsourcing of standardised work to the subsidiary in Eastern Europe

for the system supplier FirstTier. Before addressing the question of how engineering became virtual, we briefly introduce the field of study, the German automotive industry and automotive engineering.

The German Automotive Industry

Before general issues about automotive engineering are discussed, let us take a look at the German automotive industry which is one of the most revenue-generating and employment-intensive industrial sectors in Germany. It also plays an important role in the global automotive industry where Volkswagen (VW) was ranked number one in 2014 for the first time ever. The variety of companies engaged in the German automotive industry is vast and the industry profits from the small and medium enterprises in which more than 80 per cent of the employees are working, creating 75 per cent of the total value. More than 700,000 people were working in the German automotive industry in 2013. Almost 93,000 employees work in research and development (VDA 2014; Jürgens and Meißner 2005).

Three main categories of companies could be identified in the automotive industry: OEM, supplier, and engineering service companies. Further distinctions were made between mass car producers like VW or GM (with Opel in Germany) and premium car makers like BMW

for example. The supplier market can be differentiated between those who supply complete and complex systems and those who sell single components. During the last decade when there has been an intensified division of labour between OEMs and suppliers, their competencies have increased and their fields of service expanded. As a consequence, the boundaries between system suppliers and the third type of company, engineering service suppliers are not as clear cut as they had been before. OEMs especially have restricted and continue to restrict the scope of their engineering. This is realised by continued outsourcing of engineering units to their suppliers or by contracting engineering services from engineering service providers (Schamp et al. 2004; VDA 2004).

Automotive Engineering

Automotive engineering is facing crucial changes in the organisation and nature of work. At the time when computer-aided design workstations began replacing drawing boards, simultaneous engineering processes started to replace step-by-step engineering methods in the product development process (PDP). Instead of procedural step-by-step phases the PDP is organised in more modularised, iterative and overlapping phases. This reorganisation of engineering shortened the whole PDP and yielded a 'projectification' of work. As a consequence, more miscellaneous car projects at diverse stages in the PDP have to be handled by the engineers. These overlapping project phases demand more intensive communication with all the people involved in the previous and following project phase, crossing all the functions involved in the car development process such as engineering, marketing, finance, and production planning. Time-saving is the dominant aim of simultaneous engineering processes. The production the product development process for new cars has been cut to seven years. To counterbalance the fact that more people are involved simultaneously, companies try to cut their product development costs through standardising products. The standardisation of products is achieved through platform strategies and modularisation. During the last decades the model variety available has grown enormously. New cars are ordered customised on demand and no longer stockpiled. Platform strategy

means using the same platform (the bottom part of a vehicle) for several models and brands within the same vehicle class. This works inside one enterprise as well as with cooperating car makers (e.g. Fiat and GM using a common platform some years ago for the small vehicle class Opel Corsa and the Fiat Punto). By modularising car components, OEMs and suppliers try to downsize the number of components used (Fig. 3.1). The common parts principle results in the curious situation that if you remove the chassis of different cars within the same vehicle class you find many similar components inside (Will-Zocholl 2011).

Informatisation of Engineering: How Engineering Became Virtual

To understand why the issue of globalising work in automotive engineering appeared much later than, for example, in software engineering, while at the same time, the automotive industry, with its world-spanning production networks, has been organised globally for decades, we have to take a look at the changes in engineering work over time. In this way the

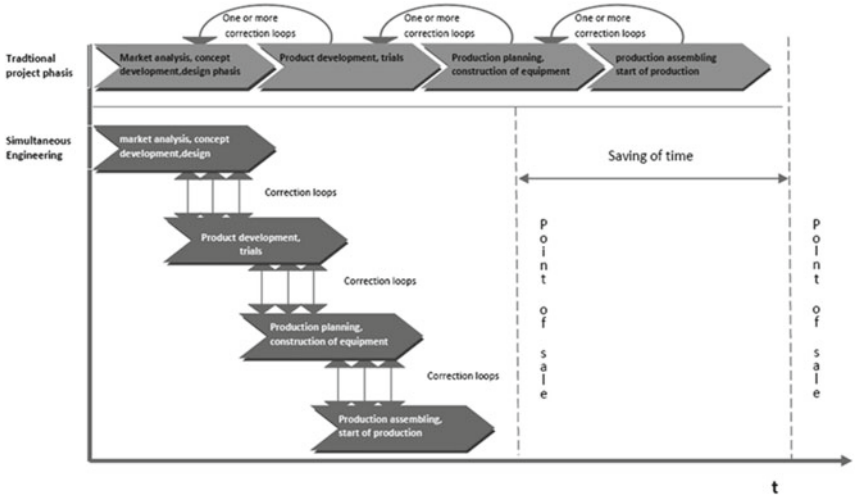

Fig. 3.1 Simultaneous engineering compared to traditional product development processes. (*Source*: adapted from Eigner and Stelzer 2009)

virtualisation of engineering can be regarded as a new phase of informatisation. But how has engineering become virtual? Just as double-entry bookkeeping marks the start of a general informatisation process, the establishment of the bill of materials as an abstraction of the physical product is deemed to be the origin of the informatisation of engineering. This happened long before modern computer-aided design (CAD) software allowed for the digitisation of physical entities, leading to an ongoing virtualisation of products and processes. Prior to that, engineering had been locally bounded because of the means of work. In times of using drawing boards (Fig. 3.2, left column) to design and develop cars and components, it had been obvious why people had to work together in the same place or located close by. The drawings (Fig. 3.2, middle) had to be stored and exchanged physically and teamwork was possible on-site. Standing around the drawing board generated new ideas and enhanced the design of components; seen in this light, engineering drawings operated as a communication medium. The way of working was completely different; thinking in drawings is different from thinking in the logic of 3D-CAD models (Böhle and Milkau 1988; Schmiede and Will-Zocholl 2011).

Until the end of the 1970s drawing boards were standard. During the following decade CAD software was used for technical drawing at work stations located in the engineering offices. The 3D-CAD software of today could be used with usual notebooks. These 3D-CAD models are used to create digital mock ups (DMU) (Fig. 3.2, right column) which can simulate future functions of single components. The virtualisation of prototypes enables the development of production tools long before the production plant is built. Finally, this is leading to the simulation of

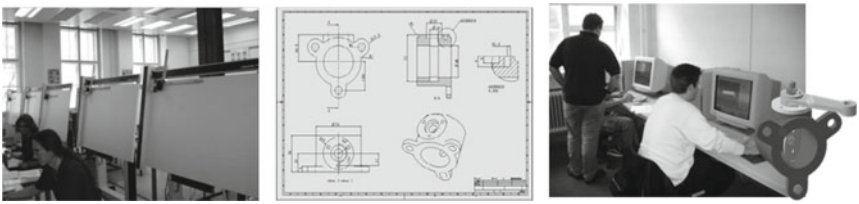

Fig. 3.2 Former workplaces in engineering—drawing—today's workplaces—digital mock up. (*Source*: Anderl 2006)

virtual production plants integrating all relevant areas like manufacturing, control, logistics, finance, and marketing (Anderl 2006).

While the informatisation of engineering work reaches back to the development of bills of material (the first DIN 199 standard was released in 1984 by the German Institute for Standardization; the International Standard ISO 10209-1 followed in 1992), the digitisation started with the development of CAD software, firstly to support engineering drawings, and later to substitute the drawing boards in engineering offices with 3D-CAD software and computer workstations. Today the bills of material are also digitised and are part of specialised software, for example SAP Automotive, or are otherwise integrated in CAD software. The genesis of so-called integrated product development systems (PDM) forms the basis for new forms of work organisation including a still ongoing process of division of labour.[5] In this sense, digitisation could be regarded as a prerequisite of virtualisation. Access to real-time data across the globe, as well as the availability of a qualified global engineering workforce, seem to be the crucial conditions for further development. What do these changes imply for the spatial dimension of engineering work?

Globalisation of Engineering

The emergence of virtual prototyping and the disposability of digital mock-ups nourished the idea of global engineering in the sense of a 24-hour engineering process: engineers all over the world could collaborate to work efficiently, nonstop, on a single component of a product. Concepts of global engineering suggest that engineering is becoming flexible in a timely and spatial manner.[6] This idea has optimistically been adopted by the management of companies, organisations, and even at universities. Following the arguments of global engineering advocates,

[5] To be clear: in automotive engineering the division of labour between OEMs and suppliers has a long tradition starting with the delivery of production parts over the just-in-time integration at the production line to recent forms of buying custom-developed systems and services using modular conceptions.

[6] A very naïve and ideal view as there are no power relations and competition existing in the emerging virtual space.

it seems inevitable that engineering work will be reorganised in this manner. However, looking at the empirical evidence which is presented here, it is obvious that this glittering vision has not come true yet—and for good reasons. First of all, it has to be mentioned that the idea of global engineering is understood in different ways. MassCar labelled its collaboration between all globally distributed captive engineering centres (responsible for different brands, components, and vehicle classes) as a global engineering strategy, while FirstTier1 and FirstTier2 use global engineering in the sense of a 'Best-Cost-Sourcing' strategy to outsource engineering work to low-cost subsidiaries. Global engineering could also mean bypassing management levels of suppliers to influence the sourcing strategies of the suppliers. They were forced to include offshoring proportiones (rates) calculating their offers.

Standard obstacles such as differing cultures, language problems or time-gap challenges, as they emerge in every globally organised project and as mentioned in all four cases, conceal underlying problems such as conflicts of interest. These may occur inside and between companies and are not limited to the typical high-cost-*versus*-low-cost problem of fearing job losses at the high-cost location.[7] Outsourcing work, especially to Eastern European locations, has a disciplinary effect on the employees. In the case of transporting prototypes across Europe the financial advantage of relocating work is obviously not verifiable. Another challenge is collaborating under competitive conditions: at MassCar, with its globally organised engineering, this caused massive problems in getting its local engineering regions to work together in terms of intellectual property. As a result, a clearing centre to charge royalties for intellectual property rights inside the company (among the captive engineering centres) has been established. Further obstacles in the realisation of global engineering are strongly connected with the limitations of virtualisation. At first glance it seems as digital data and virtual prototypes would allow engineers' work to be cut into more arbitrary parts than before, extracting routine tasks such as calculating and simulation tasks, leaving it to any individual.

[7] Somehow it is surprising that we were confronted with this fear and concrete situations while conducting the study. At the same time, there had been a discussion of skill shortages in high-skilled technology work in Germany where it seems as if there is a danger of running out of engineers.

By doing so, the tight relationship between physical and digital mock-ups is underestimated. Not everything that has been simulated so far could be transferred to the physical prototype on a one-for-one basis. Hence, companies often realise that more competencies than expected are required for the duties they had outsourced to low-cost countries. As a consequence, FirstTier1, for example, is building up a road-test division at an Eastern European subsidiary where so far only simulations have been done. The leader of a business unit describes the issue as follows:

> We are building up the road-test division. One thing is that you need test tracks there […]. You can't use the prototype systems on the road immediately—that could be dangerous. […] Therefore we need a test track there. But we also need the car there. And especially prototypes are very expensive and therefore rare. […] They are extremely rare, so we have to share one with the customer and other departments—it's not only us with our ESC [Electronic Stability Control] System—we have to share these vehicles here and then with [Eastern European Subsidiary], too. […] Therefore I can't easily say: 'Either I will do it here or there'. On the level of road testing there is no legwork in this sense (FirstTier1: 205–217).

These findings endorse the results of Bailey et al. (2012) in their engineering study conducted in the American automotive industry. It shows that neither is it possible to work with virtual representations only (without any experience with the physical entities such as simulation tools), nor is it possible to cut construction work packages into pieces arbitrarily because the segmentation of single components is limited by their physical functionality. Bailey et al. indicated further that the potential of virtual engineering is overestimated by managers organising the engineering processes—the 'lure of the virtual' (Bailey et al. 2012: 1485). We found the same tendencies on the level of managing directors and also in universities educating engineers where there is a kind of hegemonic thinking that if the work object is digitised and virtually available, work on this virtual entity could be distributed all over the world and thus any work could be done in virtual teams. We saw that these assumptions were reinforced because the required technologies evolved faster than expected, for example the binary rate of huge amounts of data or the availability of real-time databases. The engineers on the operative level have a much more realistic view, dealing

with these high-flying expectations in their everyday work. They describe that the material side remains important although the models are virtualised. That is to say, the virtual and physical entities in simulation (or construction) remain connected. This seems to be a growing limitation to virtualisation. In terms of competencies, specialisation has occurred, leading to a further separation of the physical and virtual world. But people with no experience in physical components are not able to do the calculation, for example, or anything else. As a consequence, engineering is more locally bounded than management often thinks it is. But this is not the only limit to virtualisation. It seems as if not everything relevant in earlier engineering processes (in conjunction with drawings and drawing boards) can be transferred to the digitised world.

Nonetheless, engineering work has certainly changed and is more transnational than before. This has to do with globalisation processes which take place apart from the 24-hour engineering. In the example of MassCar, this is closely connected with its aim to use more common components including common platforms for different brands inside their enterprise (and with external partners, too). Using common components, they implemented a global engineering matrix with globally distributed responsibilities for different components. This is leading to a situation that could be described as 'globalisation through the backdoor' (in analogy to Flecker and Meil 2010) when any revision of a single component has to be approved by someone who is globally responsible. Every change has an impact on others and local failures are also global ones:

> The requirements […] have changed, it's no longer completing one's task, but one has to document, namely document in detail, because he is no longer working locally but supra-nationally or globally. That means formerly I could do a test, talk to my group leader or department leader and archive my report. Today this report is provided worldwide and colleagues from other regions access it. […] If something is wrong in the report, the failure is being dispensed worldwide (MassCarP7: 118f.).

The high amount of outsourcing at OEMs is related to the increasing complexity of automotive components. More and more electronic and mechanical parts have to be developed synchronously and tested permanently against collision risks. This requires continuous communication and

exchange. The same is true for not-foreseen problems occurring during engineering which can more easily be solved working in a common space (which means mostly—but not limited to—one place). Two examples should be mentioned here. Firstly, PremCar launched a 'Project-House' project to develop a concept car to be presented at a vehicle fair. They put all the people working on this project together in one place, so that everybody working on the car could see who was working with the physical entities in the hall and who was in his or her office, thus allowing everyone to meet their colleagues and to exchange and discuss ideas personally. The results were exceptionally good and the work was very efficient. The second example is the engineering of a global platform for middle-class vehicles at MassCar. An engineering process was set up with all the captive engineering centres that would later build a brand car on this platform. The global team used video and telephone conferences and virtual working environments to work on a regular basis but were not able to solve some problems:

> We had a global process, there we had a telephone conference once a week, lasting two to three hours and the people were not able to make terms. Sometimes the fronts were hardening, they couldn't even talk to each other reasonably. Then we said: "Ok. We will have a four-day workshop." […] After four days of workshops they came out and cleared 80 per cent of the problems they were not able to solve throughout a year. (MassCarS1a: 698–714)

As a consequence another platform project was organised in such a way that all the people involved had to stay at one engineering location for two years to work together in one place.

The Importance of Codification of Knowledge

The informatisation of engineering with its latest digitalised and virtualised outcomes leads to an increasing division of labour among local and global engineering partners. OEM companies especially changed their business models to focus on their core competencies (whatever they thought these were). In these circumstances the demand for a codification of knowledge rose, especially at MassCar with its global engineering organisation. Codification of knowledge means the conversion of 'tacit

knowledge' (Polanyi 1967) or 'working knowledge' (Harper 1987) into a usable form for all organisational members. But tacit knowledge cannot be simply extracted from people's minds to enable the global distribution of knowledge-intensive work, it is an inseparable part of a person, and its transformation into explicit knowledge is becoming more and more relevant. As knowledge changes when it is passed on to somebody else, it can only be experienced by the people themselves. But the presence of such knowledge can reduce complexity in cooperative contexts. It cannot be replaced or mediated through technological systems or tools. This means the engineers are confronted with increasing documentation tasks beside their legal documentation duties. While PremCar, with its very centralised engineering, shows only weak process standardisation aims, MassCar is trying to harmonise its global differences in how things are done by finding the best company-wide process and writing detailed documentations:

> Yes, the effort to document, the accuracy has increased compared to former projects. In doing so, they try to globalise the whole thing, i.e. an American folder and documentation system should be the same as here, just as [anywhere else in the world MWZ]. (MassCarP7: 117–118)

The aim of a more detailed documentation is the assimilation of workflows by standardised process instructions. As a consequence documentations escalated, huge data bases were generated and new ICT-systems were introduced to standardise workflows worldwide. But standardisation of processes or documentation of processes does not automatically lead to uniformity. At MassCars they narrate their experiences with different documentation requirements: while the American engineering departments document the processes in a very detailed way, (so far) the German departments do not document every step in such a detail. The binding character of the documentation requirement differs too, so that, in the end, the outcome is different despite common specifications. This is also the case with the results of calculations or testing that has been done elsewhere. Independent of possible solutions, a MassCar engineer described the situation that engineering action is not the same around the world and that the virtual representations are open to be interpreted in divergent ways. Not even the use of the same software leads to the same

result. Too many local versions of SAP or other ICT systems are used. The assimilation or the trials to align them are described as a laborious and very extensive process. Also engineering action is *notas* standardised by far as it should be in order to guarantee that it is done in the same way by different persons. An engineering manager at MassCars illustrated this in a comprehensive way when he argued that it would need robots to work without any degree of freedom in working. The guidelines would be so detailed, such as telling the engineers how the pen must be held and in which corner of the paper the drawings should start and so on, and in the end the result would still be different.

The ICT-based data and information organisation is often so complex that it is not possible to retrieve the relevant information. Or, if the information is found, it may happen that an engineer is not authorised to see it. As a consequence, personal communication is used to reduce complexity. All companies under study want their employees to share more information and knowledge in a useful way (not via intranet, which is the so-called 'information grave'). But so far the dilemma is evident: from other examples we know that it is hard to share tacit knowledge and that this knowledge changes by transmission to others. Not without reason, engineers from the low-cost subsidiaries (especially at both suppliers FirstTier1 and 2) were sent to German locations to learn from the engineers there—face-to-face, in one place and with physical prototypes.

Conclusion

The empirical findings show new topologies of engineering work. The emergence of these is closely connected to the virtualisation of engineered products. Engineering methods have changed from step-by-step processes to iterative, overlapping and so-called simultaneous engineering processes. 3D-CAD software enables the development of virtual prototypes that can be tested virtually before building physical prototypes. Vast data bases are generated which allow access to relevant data all over the world in real time. These developments form the basis for the idea of global engineering—the global distribution of engineering work, 24 hours a day. Engineering seems to be becoming spatially flexible: any time—any

place. With regard to the outcomes, it can be said that it is more about a globalisation of engineering than global engineering. The strategies of the companies studied and the ensuing engineering work could be characterised as locally bonded and globally distributed at the same time. Different degrees of transnational organisation showed up, ranging from PremCar with its centralised German-based engineering to the systems suppliers (FirstTier 1 and 2) with their nearshore subsidiaries and finally MassCar with its transnational engineering network of captive engineering centres, nearshore (Eastern Europe) and offshore (India).

The idea of global engineering is restricted by the limitations of virtualisation. On the one hand, people experience the outsourcing of their work (starting with standard or routine work) to other places and, on the other hand, they know about the specific limitations, the stickiness of virtual and physical entities. As a consequence, the engineering of cars cannot be split up arbitrarily because there are strong functional coherences. Furthermore, virtual representations, as they are more or less an abstraction of the real world, cannot replace physical prototypes completely. This has an impact on the production of 'placelessness' (see further Jörg Flecker and Annika Schönauers contribution in this book) which will not succeed as much as automotive managers (or others) would like it to. In addition to this crucial barrier, more obstacles, such as the lack of data quality, restrictions of ICTs, 'standard' problems of distributed working (see Ryser et al. in this book), as well as an increasing complexity of engineers' work appear.

In consideration of these circumstances, the question of people is as important as the question of place. It remains necessary to translate the results of the virtual world into the physical one and vice versa and this needs experience. Virtual models—despite coming across as quite 'real'—are more abstract than former models used in automotive engineering because they refer to informatised models and not to reality. This translation between the two worlds can not be valued high enough. Who wants to drive a virtual car instead of a real one? If engineering should be reorganised through information space(s)—and go far beyond the principle of digital workbenches—a common working space is needed where the construction, simulation and other elements of work could take place in the presence of people (with the necessary knowledge). This

requires more than a simple provision of meeting rooms (as, for example, TeamCenter software provides) or semantic notes of digital mock-ups (Völz 2011), and is also leading to temporal restrictions.

Experience-based tacit knowledge (Polanyi 1967) is needed in order to make use of the options of a virtualisation of engineering. Bringing people together is crucial for successful engineering projects. The aims of reducing complexity by standardisation and building up enormous documentation systems have not been successful so far because these affect the working capacity of people (Pfeiffer 2004). Local 'spatial fixes'" (Jessop 2006) of engineering, show up for example in cluster regions or the on-site locations around the OEM engineering centres. This leads to the conclusion that place still matters. In regions where specialised clusters have been formed, as in the case of the automobile industry in Germany and in other European countries, the surroundings for a high-quality level of engineering are provided. But this is not a reason not to relocate complete engineering projects elsewhere in the world. This means that engineers' work is complicated to distribute but not impossible to replace by other engineering locations nearshore or offshore at some point in time (as it is already happening refering to eCars and selfdriving cars). Until then, these scenarios are being also used as a disciplinary force to 'Keep quite' employees in high-wage countries.

References

Anderl, R. (2006). Produktentwicklung in der Automobilindustrie. In A. Baukrowitz, T. Berker, A. Boes, S. Pfeiffer, R. Schmiede, & M. Will (Eds.), *Informatisierung der Arbeit—Gesellschaft im Umbruch* (pp. 37–52). Berlin: Edition Sigma.

Aspray, W., Mayadas, F., & Vardi, M. (Eds.) (2006). *Globalization and offshoring of software*. In Research Report of the Association for Computing Machinery (ACM). http://www.meti.go.jp/committee/materials/downloadfiles/g61226a06j.pdf . Accessed 8 April 2016.

Bailey, D. E., Leonardi, P. M., & Barley, S. R. (2012). The lure of the virtual. *Organization Science, 23*(5), 1485–1504.

Boes, A., & Kämpf, T. (2010). Offshoring and the new insecurities: Towards new types of 'White Collar Consciousness' in Germany in globalised working environments. *Work Organisation, Labour and Globalisation, 4*(1), 104–119.

Boes, A., & Kämpf, T. (2007). The nexus of informatisation and internationalisation—A new stage in the internationalisation of labour in globalised working environments. *Work Organisation, Labour and Globalisation, 1*(2), 193–208.

Böhle, F. and Milkau, B. (1988) *Vom Handrad zum Bildschirm*. Frankfurt a. M., NY: Campus.

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, prosperity in a time of brilliant technologies*. New York: W.W. Norton & Company.

Castells, M. (1996). *The rise of the network society: The information age—Economy, society and culture I*. Cambridge, MA: Blackwell.

Eigner, M., & Stelzer, R. (2009). *Product lifecycle management. Ein Leitfaden für product development und life cycle management*. Berlin: Springer.

Flecker, J., & Meil, P. (2010). Organisational restructuring and emerging service value chains—Implications for work and employment. *Work, Employment and Society, 24*(4), 1–19.

Flecker, J. and Huws, U. (2004). *Asian Emergence*: *The World's Back Office*?, IES Report 409. Brighton: Institute for Employment Studies.

Friedman, T. L. (2005). *The World Is Flat: A Brief History of the Twenty-first Century*. New York: Holtzbrinck Publishers.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Cambridge: Polity Press.

Gleeson-White, J. (2013). *How the Merchants of Venice shaped the modern world—And how their invention could make or break the planet*. London: Blue Guides.

Hardy, J., & Hollinshead, G. (2011). The embeddedness of software development in Ukraine: An offshoring country perspective. *European Planning Studies, 19*(9), 1633–1650.

Harper, D. (1987). *Working knowledge. Skill and community in a small shop*. Chicago: University Press.

Harvey, D. (1989). *The condition of postmodernity: An enquiry into the origins of cultural change*. Oxford: Blackwell.

Jessop, B. (2006). Spatial fixes, temporal fixes and spatio-temporal fixes. In N. Castree & D. Gregory (Eds.), *David harvey: A critical reader* (pp. 142–166). Oxford: Blackwell.

Jürgens, U. and Meißner, H.-R. (2005) *Arbeiten am Auto der Zukunft. Produktinnovationen und Perspektiven der Beschäftigten* [Working on the car of the future. Product innovations and perspectives for the employees]. Berlin: Edition Sigma.

Lefebvre, H. (1991). *The production of space*. New York: Wiley.
Löw, M. (2013). The emergence of space through the interplay of action and structures, in *D.A. A Handbook of design anthropology*. Peter Lang (pp. 714–727).
Mayer-Ahuja, N. (2014). *Everywhere is becoming the same? Regulating IT-work between India and Germany, New Delhi*. Hyderabad: Social Science Press.
Mayring, P. (2002). Qualitative content analysis: Research instrument or mode of interpretation? In M. Kiegelmann (Ed.), *The role of the researcher in qualitative psychology* (pp. 139–148). Tübingen: Verlag Ingeborg Huber.
Moulier-Boutang, Y. (2012). *Cognitive capitalism*. Cambridge: Polity Press.
Pfeiffer, S. (2004) *Arbeitsvermögen*. Wiesbaden: Springer VS.
Polanyi, M. (1967). *The tacit dimension*. Chicago, IL: University of Chicago Press.
Pongratz, H. J., & Trinczek, R. (Eds.) (2010). *Industriesoziologische Fallstudien. Entwicklungspotenziale einer Forschungsstrategie*. Berlin: Edition Sigma.
Rifkin, J. (2011). *The third industrial revolution. How lateral power is transforming energy, the economy, and the world*. Basingstoke: Palgrave MacMillan.
Schamp, E. W., Rentmeister, B., & Lo, V. (2004). Dimensions of proximity in knowledge-based networks: The cases of investment banking and automobile design. *European Planning Studies, 5*(12), 607–624.
Schiller, D. (2000). *Digital capitalism. Networking the global market system*. Cambridge, MA: MIT Press.
Schmiede, R., & Will-Zocholl, M. (2011). Engineers work on the move. Challenges in automotive engineering in a globalized world. *Engineering Studies, 3*(2), 1–21.
Schmiede, R. (2006). Knowledge, work and subject in informational capitalism. In J. Berleur, I. Markku, I. Nurminen, & J. Impagliazzo (Eds.), *Social informatics—An information society for all?* (pp. 333–354). Wiesbaden/Heidelberg: Springer Science and Business Media.
Schmiede, R. (1996). Informatisierung, Formalisierung und kapitalistische Produkti-onsweise. Entstehung der Informationstechnik und Wandel der gesellschaftlichen Arbeit‘ in R. Schmiede (ed.) *Virtuelle Arbeitswelten. Arbeit, Produktion und Subjekt in der “Informationsgesellschaft”* Berlin: Edition Sigma), 15–47.
Verband der deutschen Automobilindustrie (2014) *Zahlen und Daten 2014*. https://www.vda.de/de/services/zahlen-und-daten/zahlen-und-daten-uebersicht.html. Accessed 12 September 2015.
Verband der deutschen Automobilindustrie (2004) *Future Automotive Industry Structure (FAST) 2015 Study—die neue Arbeitsteilung in der Automobilindustrie*,

Materialien zur Automobilindustrie 32 [The new division of labor in automobile engineering]. Frankfurt a. M., NY: IGM.

Völz, D. (2011) *Semantische Annotationen zur rechnergestützten kooperativen Produktentwicklung*. Aachen: Shaker.

Weiser, M. (1991) *The computer for the 21st century*. https://www.ics.uci.edu/~corps/phaseii/Weiser-Computer21stCentury-SciAm.pdf. Accessed 12 September 2015.

Will-Zocholl, M. (2016) Die Verlockung des Virtuellen. Reorganisation von Arbeit unter Bedingungen der Informatisierung, Digitalisierung und Virtualisierung. *AIS-Studien 9*(1), 25–42.

Will-Zocholl, M. (2011) *Wissensarbeit in der Automobilindustrie. Topologien der Reorganisation von Ingenieursarbeit in der globalen Produktentwicklung*. Berlin: Edition Sigma.

4

Algorithms that Divide and Unite: Delocalisation, Identity and Collective Action in 'Microwork'

Vili Lehdonvirta

Introduction

Marx posited that labour is 'disciplined, united, organised by the very mechanism of the process of capitalist production' (1906: 836–37). The regimented nature of factory work and life in an industrial community provided the material basis for collective action and for the shared identity required to support it. But is this still true of the mechanisms of twenty-first century informational capitalism? Castells notes that in informational capitalism, '[t]he work process is globally integrated, but labour tends to be locally fragmented' (Castells 2000: 18). The exploitation of global wage, skill, and regulatory differentials means that workers are often physically, temporally, and administratively detached and desynchronised from each other (Ashford et al. 2007). In the extreme case, coordination of workers' efforts is achieved algorithmically, that is, by automated data and rule based decision making (O'Reilly 2013), leaving no opportunity for human-to-human communication. Under such dispersal and disconnection, it would seem difficult for a common identity, let alone effective organisation, to arise among workers.

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Yet algorithms can also unite. Information and communication technologies (ICTs) have long been used to construct 'sites of resistance' that bring together people prevented from organising via conventional means (Ho and Zaheer 2002). Sites or communities formed online can offer potent identification experiences that rival the degree of identification with conventional workplaces (Lehdonvirta and Räsänen 2011). ICTs are used as part of almost any campaign of political mobilisation today, at least in the industrialised countries (Karpf 2010; Wells 2014). To what extent, then, can dispersed informational labourers make use of ICTs to re-establish links, develop shared identities, and mobilise for collective action? In this chapter, we will examine both the dynamics of dispersal as well as the dynamics of unification in informational labour, and the technological, organisational, and identity processes that underlie them. These topics are examined via an empirical study of microwork an extreme example of commodified and delocalised knowledge work. We study three different 'microwork platforms', or companies that provide microwork opportunities, and their workers.

Microwork refers to work consisting of the remote completion of small information processing tasks, such as transcribing a snippet of hand-written text, classifying an image, or categorising the sentiment expressed in a comment (Lehdonvirta and Ernkvist 2011; Kittur et al. 2013). The oldest and most well-known microwork platform is Amazon Mechanical Turk ('MTurk'), operated by Seattle-based e-commerce giant Amazon. A worker enters the site using their own or borrowed computer or mobile device, selects a task, completes it, is credited with the proceeds, and selects the next task. MTurk started as a way for Amazon to source workers for its own information processing needs, but evolved into an open marketplace where any U.S-based employer can post digital tasks for the site's users to complete. At the time of writing, over 300,000 such tasks are listed. Each completed task earns the worker-user a small remuneration, typically ranging from a few cents to a dollar or two.

Two main theoretical claims are developed throughout the chapter. One is that we must distinguish between delocalised work that is subsequently *relocalised* elsewhere, and delocalised work that remains *dispersed*. Relocalisation is exemplified by the offshoring of work to business process

service centres, where the work is performed at least partially in the context of local institutions and social networks. Dispersal is exemplified by the outsourcing of work to a platform such as MTurk, where the work is detached from local institutions and workers are dispersed. Of note is the fact that workers may remain geographically proximate to each other and to the employer, while a state of dispersal in the sense of social and institutional disconnectedness is achieved by organisational and technological means. Distinguishing between relocalised and dispersed work is important, because these two modes of or outcomes from delocalisation can have very different implications for the nature of the work and the institutions that regulate it.

The second theoretical point developed in this chapter is that the effectiveness of online self-organising as a platform for collective action in the labour market depends on the topology of such 'virtual places', and how it matches with the contours of the market it is intended to influence. The algorithms and social processes that shape the memberships of online communities may leave such communities ill organised to exert collective influence on a particular employer or market segment. Boundaries of shared identities are particularly important in this regard.

The rest of the chapter is organised as follows. First, we will draw on previous literature to discuss the organisational and technological processes through which microwork platforms produce placelessness and dispersal. We argue that we must also understand what impacts these processes have on identity formation in order to understand their full implications for collective action. We will then introduce the empirical study, consisting mainly of participant observation and interviews of 30 microworkers. We first use the empirical study to examine microwork in everyday life and its consequences to organisational identity. We will then use the study to examine attempts to counter dispersal and reunite microworkers, both on the material level of bringing dispersed workers together in 'virtual places', as well as on the ideological level of developing occupational and class identities. In the final section, we will discuss the main findings in the context of some earlier work on service value chain restructuring and freelance knowledge workers, highlighting theoretical and policy implications.

Background: Dispersing Workers into the Cloud:

Detaching Work from Social and Institutional Contexts

MTurk is the primary source of income for many people (Ipeirotis 2010; Ross et al. 2010), yet it lacks almost all of the signs and trappings of 'standard work'. There are no physical work sites, working hours, or other behavioural controls. There are no persistent duties or responsibilities, and no temporal commitments between the worker and the employer, beyond the seconds or minutes it takes to complete a task. There are no job titles, recognisable supervisors, clients, or colleagues, as all interactions necessary for the completion of a task are anonymised and mediated by algorithms. The relationship consists almost entirely of market-based transactions mediated by a digital platform. In other words, work on MTurk is extremely detached in the sense elaborated by Ashford et al. (2007): administratively detached from organisations' formal membership structures; physically detached from sites of work and from colleagues and supervisors; and temporally detached and desynchronised from their daily and seasonal cycles and life courses. Other microwork platforms have different characteristics and sometimes lesser levels of detachment, as will be described later. But relative to standard work, detachment from physical, temporal, and administrative structures remains microwork's defining feature.

Previous literature suggests that this high level of disembeddedness in microwork is not coincidental. It is MTurk's aim to provide human labour as a flexible on-demand service accessible via the internet: the labour equivalent of cloud computing. Irani (2013) locates the demand for this type of 'cloud labour' in the organisational and technological practices of the high-tech industry. High-tech firms compete against incumbents in different industries by using technology to automate and optimise processes in order to realise cost savings and performance improvements. Whenever possible, human workers are replaced with artificial intelligence, and business processes implemented as software. For example, whereas a traditional retail company would have inventory managers who spot duplicate entries in the product information provided by different suppliers, Amazon aimed to delegate this work to an

algorithm. Such work turned out to be beyond the capabilities of current technology; engineers described the problem as 'insurmountable' (Harinarayan et al. 2007, cited in Irani 2013). But instead of giving up on the software-based model and going back to a human-centric business process, Amazon re-engineered human labour to be compatible with the software:

> Amazon engineers instead developed a website through which people all over the world could check each product for duplicates, work simultaneously, and receive payment per product checked […] By developing [MTurk], Amazon retained its existing divisions of labor and organisational practices—the same structures into which they hoped to integrate artificial intelligence approaches—while integrating on-demand human workers. (Irani 2013: 4)

Microwork thus emerged as a stand-in to compensate for the shortfalls of artificial intelligence; in recognition of this, the tagline of the MTurk website is 'artificial artificial intelligence'. Many competing platforms have emerged since MTurk was first developed. A key feature of these platforms is that they provide employers with an 'API', or application programming interface: a codified interface through which the employer's software can issue inputs to and receive outputs from the workforce as if it was a software module. Software firms use these APIs to create such products as expense tracking apps (workers enter details from scanned invoices into a database), searchable porn sites (workers write descriptors for video clips), and calorie counting apps (workers name foods present in a photo). The APIs are also used by computer scientists to teach machine learning algorithms. To perform like a software module, labour needs to be available at any time from any place, and it needs to rapidly scale up to hundreds of thousands of work units when necessary. For this to be possible, it must work without human input. A buyer of MTurk labour interviewed by Irani explains this as follows:

> You cannot spend time exchanging email. The time you spent looking at the email costs more than what you paid them. This has to function on autopilot as an algorithmic system […] integrated with your business processes. (Irani 2013: 8)

The above quote illustrates how demand for disembedded microwork stems from organisational and technical practices in the high-tech industry—but also how this disembeddedness is achieved in practice. Same or similar work has been performed in the context of more conventional employment arrangements that are embedded in and interdependent on the work of physically proximate others. Specific efforts and technologies must be deployed to detach such work from the firm's physical, temporal, and administrative structures. In the case of microwork, this detachment is produced in large part through deskilling and codification: breaking tasks into small parts and formalising them, making interdependencies so simple to manage as to no longer require workers to have strong ties to each other, to the employer, or to the end-client. This is achieved with the help of specialist consulting services and technologies provided by firms acting as 'transformers' of conventional work to microwork (Lehdonvirta and Ernkvist 2011). The use of APIs is emblematic of the resulting work organisation, insofar as it reduces interactions between employers and workers to sets of strictly pre-defined request-response pairs that can be transmitted over digital media. Deskilling and codification are not unique to microwork (Huws et al. 2009), but in microwork they are often taken to a more extreme degree than in conventional business process outsourcing.

Besides deskilling and codification, another process that is important in producing the detached quality of microwork can be termed 'legal engineering'. Microwork platforms frame the relationship between the worker and the employer as independent contracting, never as legally protected employment (Cherry 2010). Legally protected employment in a host country would create an attachment between the employer and the worker that is incompatible with the notion of rapidly scalable and downscalable 'artificial artificial intelligence'. This framing is enshrined in the marketplaces' standard contract terms that neither the worker ('contractor') nor the employer ('client') has power to negotiate. Some microwork platforms are moreover designed in such ways as not to trigger statutory definitions of employment, for example by preventing a worker from working continuously for a single client. Garry Mathiason, chairman of Littler Mendelson, discussed this in a presentation he gave at an industry conference in San Francisco on 23 October 2013. Littler Mendelson is

a labour law firm that advises companies in the online staffing industry, including microwork platforms. According to Mathiason, clients have 'built into the software tests and processes to help ensure that independent contractor status is achieved.' In other words, specific efforts and technologies are deployed to detach microwork from national legal frameworks.

Production of Placelessness and its Limits

An important consequence of microwork's disembeddedness is 'placelessness', or a lack of embeddedness in particular spaces or territories. Microwork is a particularly extreme example of placeless work: it can, and indeed must, be performed without access to a physical work site, and could in principle be carried out from anywhere in the world with an Internet connection. Flecker and Schoenauer argue in this book (see Chap. 2) that placelessness is not an inherent quality of any work; it must be actively produced by means of suitable organisational and technical arrangements, such as codification. In some cases, microwork's placelessness is simply a by-product of the pursuit of extreme organisational detachment, and of little consequence to the employer. In other cases, microwork's placelessness is produced intentionally, with a view to exploiting geographic differences in skills and labour costs, or the power that the ability to compress time and space selectively brings to its wielder.

It is important to note certain complications in the concept of placelessness. Even if microwork is 'placeless' in the sense of being disembedded, in practice it is still performed by workers who live somewhere in the world, not in the metaphorical 'cloud' of information technology. Table 4.1 shows MTurk workers' top countries of origin according to a 2009 survey conducted by Ross and colleagues (Ross et al. 2009). It shows that most workers by far come from the United States and India. Kingsley and colleagues have further surveyed where workers are located within these two countries, finding that workers are concentrated in certain areas rather than being distributed uniformly within the population (Kingsley et al. 2014). In other words, the distribution of MTurk's workers is marked by strong geographic patterns, and is in this sense

Table 4.1 MTurk worker survey respondents by country of origin (Ross et al. 2009; *N* = 573)

United States	57 %
India	32 %
Canada	3 %
Philippines	1 %
United Kingdom	1 %
Pakistan	0.5 %
Romania	0.5 %
(Other)	5 %

place-specific. In part this place-specificity is attributable to spatial differences in factors such as Internet penetration, skills, and labour costs. Work that is detached from its original places 'flows' into the most favourable places on the map, like melting water flows to the lowest point in the landscape. However, this explanation fails to address the most prominent geographic pattern in the data: that most work by far flows into the United States and India, even though countries like the United Kingdom and the Philippines present comparable skill, cost, and access landscapes.

This geographic pattern is most likely attributable to the fact that Amazon's payment system is capable of processing payments to bank accounts in the United States and India only. Workers in other countries can be remunerated only via Amazon.com gift cards, which makes the work far less desirable. Historical participation data collated by Ross and colleagues (2010) supports this explanation. MTurk's workforce was initially dominated by US workers. Participation from India shot up only after Amazon introduced payments to Indian bank accounts in 2009. In other words, microwork on MTurk is imperfectly delocalised, in that it relies on local payment infrastructures. More technological integration work and legal engineering would be required to make the platform closer to being truly 'placeless'. But for Amazon, this may not be necessary. It is crucial for the business model that labour is detached from local organisational and institutional structures, so that it may be sold as an on-demand 'cloud' service. Whether or not the work then flows to a different geographic location where suitable skills are available cheaper is less important. This sets microwork apart from offshoring.

Delocalisation, Collective Action, and Identity

To address the implications of this mode of work organisation to organised labour and collective action, we must examine not only its material and organisational aspects, but the other leg on which collective action stands: shared identity. In modern society, work and occupation are seen as central components of identity; in terms of both how the individual sees themselves in relation to others, and in how others regard the individual (Tajfel and Turner 1986, Stryker and Burke 2000). Two conceptions of identity are particularly salient to work organisation: organisational identity and occupational/class identity. The notion of organisational identity is frequently used in organisation and management studies, where it draws from social identity theory and interactionist theories of identity. Workers 'identify' with their employers (Dutton et al. 1994, Riketta 2005), supervisor relationships (Sluss and Ashforth 2007), and teams (Riketta and van Dick 2005), in the sense of experiencing varying degrees of affinity or oneness with them. These identification experiences have various important individual and social consequences, including especially enhanced self-esteem, pro-social behaviour at work, and solidarity with other group members (Van Knippenberg and van Schie 2000). Depending on the target of the identification, organisational identity can suppress as well as support collective action; for example, team members might support each other in a dispute, or side with the employer that they strongly identify with.

In sociological and critical studies, it is more common to use notions of occupational and class identities as ways of conceptualising shared identities in the context of work (Huws and Dahlmann 2010). The notion of a shared occupational identity holding individuals in the same trade together can be traced to Durkheim (1997), while the notion of class identity, or individuals becoming subjectively aware of their shared economic interests, originates from Marx (1906). Occupational and class identities are potentially capable of acting as bases for solidarity and collective action for broader segments of people than organisational identities. However, their social and material preconditions are also seen as more complex and demanding.

A growing amount of empirical research addresses identity in conventional business process outsourcing and IT outsourcing work (e.g. Huws and Dahlmann 2010; Barley and Kunda 2006; Rock and Pratt 2002), but very little research has been done in the context of such extremely delocalised work as microwork. Irani (2013) examined identity in microwork from the employer's perspective, showing how this mode of work organisation invites the developers to see themselves as 'innovators' who are a distinct breed from the 'crowds' across the API. Our aim is to address the workers' experience. Are dispersed microworkers able to develop organisational, occupational, or class-based notions of shared identity? What technological or organisational resources do they draw on in the process? Are these shared identities enabling actual collective action? In the following empirical part of this chapter, we will address these questions, as well as provide more detail on the material circumstances and technological contexts in which the workers find themselves.

Research Design: a Tale of Three Platforms

Our overall research strategy consisted of successive rounds of data collection followed by qualitative analysis. The initial data consisted of field notes from participating in MTurk in the role of a worker and as an employer, of workers' discussions observed in one microworker online community, and of messages exchanged with workers within that community. This was followed by a second wave of data collection consisting of a series of interviews with managers of microwork platforms (N=4) and of microworkers themselves (N=30), and observing public worker discussions in additional online communities indicated in the interviews. Interviewees were recruited through three different platforms that offer microwork to workers: MTurk, MobileWorks, and CloudFactory. The objective of this three-pronged recruitment strategy was to obtain a wide degree of variation in geographic context and socio-demographic background. MobileWorks ('MW') is a start-up company based in Silicon Valley. MW serves workers in various countries, but especially in the Philippines. CloudFactory ('CF') is a social enterprise based in Kathmandu, Nepal, and most of its workers come from that area.

Table 4.2 Workers' socio-demographic characteristics

	Whole sample	US/MTurk	Philippines/MW	Nepal/CF
N	30	10	10	10
age	29.3 (s.d. 9.8)	37.6 (s.d. 11.8)	28.1 (s.d. 1.8)	22.0 (s.d. 2.8)
females	63 %	80 %	70 %	40 %
Education	33 % student 23 % graduate	30 % graduate 10 % student	30 % graduate	90 % student 10 % graduate
Household	43 % with parents 23 % with partner and kids	40 % with partner and kids 30 % with partner	30 % with parents 20 % with partner and kids	90 % with parents 10 % with partner and kids

MW and CF agreed to provide us with interview access to their managers and enabled us to contact their workers to solicit interviews. Amazon did not respond to requests, so we recruited MTurk worker interviewees through a major worker-run online community; these informants are likely to be more active users than is typical. Interviews were conducted face-to-face (two managers), via teleconferencing (two managers and two workers), and via text-based instant messaging (IM) channels also used by the workers in their peer communications (28 workers). A total of approximately 60 hours of interviews were conducted from 2012 to 2013. The analysis consisted of iterative coding to identify themes and concepts from the data, with particular sensitivity to themes potentially bearing on identity and collective action.

The socio-demographic characteristics of the sample are presented in Table 4.2. The country/platform sub-samples have very different socio-demographic profiles. Our American workers are older, predominantly female and living with a partner; Filipino workers are in their late 20s; and Nepalese workers are primarily college students living with their parents.

Dispersed Work and the Death of Organisational Identities

The efforts and technologies deployed to produce placelessness at work also change the nature of the work (Flecker and Schoenauer, Chap. 2 in this book). In this section, we examine what implications microwork's

delocalised nature has to organisational identity. We begin by discussing how microwork relates to workers' socio-economic circumstances, which allows us to understand how the implications can be socially contingent, including varying from one country to another.

Dispersed Work in Everyday Life

Table 4.3 summarises how microwork relates to the informants' socio-economic circumstances. The Nepalese workers mainly depended on their parents for their subsistence and used microwork to earn additional income. The Filipino workers were 'precariots', by which we mean that they cobbled together their living from microwork or a combination of microwork and other irregular income sources. The American workers were a mix of precariots, housewives economically dependent on their spouses, and salary earners who did microwork as a hobby as much as to earn additional income. Overall, the majority of our interviewees were precariots to whom microwork earnings were economically important.

Besides the earnings, informants cited availability and flexibility as important advantages of microwork. Nepalese informants emphasised that there were few earnings opportunities available to them in the local market, so the availability of foreign microwork was welcomed. For American and Filipino workers who juggled several jobs and responsibilities, it was important that they could choose when and where to spend

Table 4.3 Microworker types and income from micro-work

	Whole sample	US/MTurk	Philippines/MW	Nepal/CF
Type of microworker	50 % precariot 40 % dependant 10 % casual	40 % precariot 30 % dependant 30 % casual	100 % precariot	90 % dependant 10 % precariot
Typical weekly microwork income	$74.84 (s.d. 64.05)	$79.00 (s.d. 61.87)	$125.00 (s.d. 85.05)	$41.43 (s.d. 34.95)
Record weekly microwork income	$136.57 (s.d. 127.57)	$183.00 (s.d. 178.20)	$174.00 (s.d. 130.88)	$62.00 (s.d. 33.01)

time on microwork. One American worker used her smartphone to perform microtasks during quiet periods at her regular face-to-face customer service job. She literally worked two jobs at the same time.

Workers from all sub-samples nevertheless indicated that suitable microtasks were not always available when they wanted to work. They expressed concerns about the need to be constantly on call in case suitable or well-paying work turns up, uncertainty over the immediate future, and low overall earnings. The intensity of these issues varied according to the workers' socio-economic circumstances. The Nepalese students expressed fewest concerns, not being dependent on microwork for their subsistence. American precariots expressed strong concerns, many feeling vulnerable about unexpected changes in earnings. Although our Filipino workers likewise cobbled together their income from several contingent sources, they expressed fewer concerns than the American precariots. There are several possible explanations for this, including lower living costs in the Philippines and more active contact from MW's managers towards the workers. It may also relate to the fact that contingent employment and micro-entrepreneurship are more common in the Philippines. In a global and historical context, 'standard' corporate employment is of course no standard at all, but a peculiar feature of affluent post-World War Two economies (Ashford et al. 2007). Individuals, families, and communities in the Philippines may possess more coping strategies for microwork than America's post-industrial workforce.

Death of Organisational Identities

The concerns identified above are not uncommon in contingent service work, and speak more about microwork's contingent nature than its placelessness. But workers also brought up issues of identity, which can be traced specifically to aspects of placelessness. A particularly consistent finding was that microworkers did not experience identification with their detached and transitory employers, the firms that provided them work over the platform. Many MTurk workers had 'favourite' employers, favoured thanks to paying well, providing stimulating tasks, or generally dealing in a fair way. But this favour did not seem to amount to experiences

of belonging or membership, perhaps because workers were well aware that the distant working relationship that they enjoyed could end without notice, and often did. Another potential focal point for identification is the platform that mediates between the worker and the employer. Informants did not seem to identify with the MTurk platform at all. Informants expressed more identification with the MW platform, and most of all with the CF platform. But relative to what might be expected of standard employees in a firm, microworkers' identification with the formal organisations closest to them seemed weak.

To some extent, this finding mirrors earlier research on contingent workers' identification with employers and intermediaries (e.g., Allan and Sienko 1998, McLean Parks et al. 1998, Rock and Pratt 2002). The lack of commitment from the employer causes the worker to reciprocate in kind. But to a large extent we can also trace this finding to microwork's placelessness. As part of the delocalisation process, most tangible signs of organisational affiliation end up being erased: physical collocation, offices, employment contracts, working hours, titles, recognisable supervisors and co-workers, and even work clothes. This lack of tangible proof makes it difficult for the worker to maintain an identity based on organisational affiliation towards themselves, and importantly, towards others whom they interact with. One long-time MTurk worker expressed her frustration as follows:

> It only bothers me when I'm told it's not 'real work'. If I were writing in an office it would be considered real, but since I do it at my desk at home my husband doesn't view it as 'real' – he sees it on the same level as playing mindless computer games. [F, 41]

In contrast to MTurk, the CF platform made efforts to furnish workers with some trappings of standard employment. Workers were given titles such as 'Data Entry Officer' and could say that they worked 'for' rather than 'through' the platform. Though payment was on a piece-rate basis, CF attempted to provide the workers with a degree of regularity in earnings. Thanks to being recruited from the same university circles, many of the workers knew each other personally. There was also a degree of two-way communication between CF's managers and the workforce,

which was nonexistent on MTurk's much larger and more geographically dispersed market. Not surprisingly, workers identified more with CF than with MTurk.

Earlier findings on identification experiences in telework suggest that working remotely is in itself not necessarily deleterious to the formation of shared social identities, if the lack of tangible bases for identity formation is compensated for by means such as strong interpersonal relationships with others in the organisation (Wiesenfeld et al. 1999, Thatcher and Zhu 2006). However, our findings show that there is a tension between placelessness and organisational identity: the means that are used to delocalise work—deskilling, codification, black boxing, algorithmic management—also undermine organisational identities. The more work is delocalised and dispersed, the fewer means are available for organisational identity formation. This has implications not only for workers' relationships with employers, but also with each other, as it deprives them of the uniting banner of shared organisational affiliation. The personal consequences vary between cultural and socio-economic contexts, but the dispersal of work does seem to leave workers without a stable organisational identity.

The Working Class Reunites Online?

In this section, we move from the conceptual space of organisations and individuals to the space of labour markets and broader collective identities. We first examine how the relative bargaining powers of workers and employers are influenced by processes of delocalisation and dispersion, through theoretical discussion and empirical observations. We then use our empirical observations to examine the idea that workers might use ICTs to counter dispersion and reorganise online, and assess the implications of such reorganisation to shared identity and collective action.

Dispersion and Bargaining Power

Among other things, delocalisation can allow employers to practice 'labour arbitrage', or to buy labour from where it is cheap. Indeed, some of the critical writing about microwork platforms focuses a great deal on

the argument that by introducing foreign wage competition, these technologies diminish American wages and working conditions (Scholz 2013). But by the same token, microwork platforms allow workers in low-income countries to practice 'skills arbitrage', or to sell labour to where it is expensive. In a perfectly competitive market, the loss of welfare in America is offset by an increase in welfare in Nepal and the Philippines. The effect of microwork platforms is symmetrical, in aggregate favouring neither the employer nor the worker, but simply widening each party's search horizon. In this model, delocalisation evens out global income inequalities.

Of course, labour markets are never perfectly competitive. In markets for undifferentiated or commodity labour, it is often the case that employers are more concentrated and workers more diffuse, such as in the case of a factory and its workforce. In such a market, the employer has more bargaining power. To improve their position, workers form unions that bargain on their collective behalf. If we introduce delocalised microwork into this picture, the consequences can be quite different from the perfectly competitive model. Two consequences are apparent. First, by breaking work down into micro-tasks and making it easy for large numbers of people to perform small bits of it, microwork platforms drastically increase the number of individuals and thus the degree of diffusion on the worker side. This effect is not unique to computer-mediated work; ordinary part-time work arrangements can have the same effect of increasing diffusion and thus decreasing bargaining power on the worker side. But the effect may be more extreme in microwork.

Second, microwork platforms can make it harder for workers to organise and bargain collectively to compensate for their relative diffusion. The platforms are good at reducing the experienced distance between employers and workers, but our findings suggest that they often do nothing to eliminate workers' distance from each other. The only sign of the existence of other workers in MTurk is the fact that tasks gradually disappear from the market. Any collaboration or coordination of workers' efforts is managed algorithmically, with no opportunity for human-to-human communication. An American employer on MTurk is brought into contact with numerous workers around the world, but at the same time, the workers around the world are not provided any means to come

into contact with each other, and thus remain just as distant from each other as before. The employer can, if they wish, avoid bargaining with local, perhaps unionised workers, and instead opt to deal with de-local workers. These de-local workers may be physically distant from the employer, or they may be in the same neighbourhood—as we have seen, many MTurk workers live in the United States—but that no longer makes a difference, since the worker has been to a large extent disembedded from local institutions. Unable to contact each other, these workers cannot bargain collectively. Moreover, even if such dispersed workers obtained the means to contact each other, it is not clear to what extent they could develop a shared identity to support the solidarity required in effective collective action, as discussed previously.

Workers Reuniting in 'Virtual Places'

Algorithms divide workers, but algorithms can also unite them. All of our informants participated in an online community or group for microworkers, or maintained regular contact with other microworkers through online channels in a less structured manner. Different paths led to the emergence of these formations. One online community, founded by a worker in 2008, was a prominent gathering place for American MTurk workers. Our informants found the site by chance: through a search engine when looking for microworking tips, from an online article on microwork, and even due to it being mentioned as an answer option in a survey directed at microworkers. The MTurk platform itself made no mention of this site, but search engines, recommendation systems, and other algorithms directed workers to it. Over the years, various splinter groups had left the community to start new community sites, so that the original site's active membership was now measured in the hundreds, while other communities reported active memberships in the thousands. Workers who had met each other through these sites had also started more private chat channels consisting of a dozen or fewer active participants.

In contrast to MTurk, the MW and CF platforms provided official support for worker-to-worker communication. MW provided a built-in

real-time text chat channel that workers could use to talk to each other and to any of the platform's managers who happened to be present. MW's Filipino workers also complemented this official chat with personal instant messaging software, through which they kept in touch with online workers working on different platforms, who were often friends and relatives. CF went furthest in facilitating worker-to-worker communication, as it asked workers to organise into virtual teams of five members. Each team was asked to use their own private Facebook group and even physical get-togethers to keep in touch. In this aspect, CF's workforce resembled a conventional team-based organisation, except that the actual work was still strictly individual; the team structure was created for fostering identity and professional ethics. Unlike MW's Filipino workers, CF's Nepalese workers did not have personal networks of online labourers extending beyond the platform.

The communication technologies that workers used and the social formations that these technologies supported are summarised in Table 4.4. These formations were for the most part maintained ostensibly for instrumental information exchange purposes. But as the excerpts below demonstrate, they also formed the material basis for identity-related purposes that in a conventional workplace could be met by workgroups or occupational networks. By providing a safe 'place' for workers to gather, they allowed workers to enact 'microworker' occupational identities that elsewhere might have been met with disbelief or derision. To the extent that these self-organised formations also allowed participants to discover and express their shared interests against unfair employers, it could be said that they also allowed workers to enact class identities.

Table 4.4 Online self-organisation among microworkers

	MTurk	MW	CF
Communication technologies used	Online forum software, chat channels (IRC)	Official web chat, instant messaging software	Private Facebook groups, physical meetings
Social formations observed	Community with formal membership hierarchy, informal communities and groups	Informal networks	Five-member teams with appointed team leader

> Earning full discussion board access was an important milestone in my MTurk identity. [F, 26]

> I get what social support I need for turking from chatting with other turkers online. [M, 32]

Shared microworker identities were enacted in these formations via various kinds of identity talk. On one hand, participants discussed how a microworker ought to conduct themselves: ways of navigating work platforms, completing tasks, coping with employers, dealing with friends and family, organising one's daily life, and thinking about career and life plans as a microworker. On the other hand, participants discussed how a microworker ought not to conduct themselves, such as producing fraudulent product reviews or sub-standard work to an honest employer. Disagreements about these rules had at least in one case led to a split in the community that resulted in the forming of a splinter group on a separate technical platform. An exception to all this was MW's official web chat, which our data suggests was used mostly for purposes related to the performance of the work only, rather than for identity talk. A likely reason is that MW's managers could access the chat. The other channels were pseudonymous and/or inaccessible to managers.

Above we referred to microworkers' online communities and other self-organised formations using a geographic metaphor, 'place'. It is common for online communities to be cast as 'virtual places' that exist outside physical geography (Steinkuehler and Williams 2006). Graham (2013) cautions against the use of such 'cyberspace' metaphors, for they can mask the fact that all human action still takes place somewhere in the physical world, where its effects are felt. Indeed, it would be wrong to say that microwork moves labour to the 'cloud', as this would mask the fact that the work is still performed by individuals in distinct locations in the world, with socio-economic consequences varying by location. But bearing this in mind, the 'virtual place' metaphor is still useful for describing the workers' self-organised online communities, as it indicates that these formations are functioning as substitutes to offices, break rooms, and neighbourhoods as nexuses of organisation and identity enactment. They are not places in the geographic sense, but they are experienced as places in the relational sense, in that workers can count on meeting their colleagues there.

Fragmented Identities, Limited Collective Actions

To what extent, then, does collective action emerge from the 'virtual places' that facilitate organisation and identity formation? MTurk workers were the only ones observed to be somewhat active in this regard. They often shared information about fair and unfair employers, or employers giving unclear instructions, posting tasks that are too demanding in relation to the pay, or paying late or not at all. They also admonished each other against accepting tasks that would result in hourly earnings below some given minimum wage. One MTurk community's leader attempted to offer employers privileged access to that community's workers, ostensibly of high quality, in exchange for excluding other workers from the project. This could be seen as an example of collective bargaining. However, it is hard to find evidence that any of these actions would have substantially altered the power balance between workers and employers on the market. Probably the largest collective worker effort in the whole microwork market is Turkopticon, a database where MTurk workers can submit information on employers and check an employer's record before accepting a task. According to Irani and Silberman (2013), the Turkopticon browser plugin had been installed 7000 times after four years of operation. Compared to the total number of registered workers, which according to Amazon is over 500,000, this is a relatively small number.

It may be that microworkers' virtual gathering places and the identities they sustain remain after all too fragmented and divided to offer a basis for very effective collective action. Workers in a factory all share the same employer, but workers in a virtual community may all be working for different employers, as membership is instead shaped by the vagaries of search engine algorithms and sub-cultural splits. Membership was moreover strikingly structured by geographic boundaries. On no site or channel did MTurk, MW, and CF workers meet each other. MTurk's Indian workers also did not make themselves known in the same online places as the North American workers. National identities and distinctions were in some cases strongly enacted, one North American worker explaining how fraudulent workers who submit gibberish in place of proper work hailed 'especially from one particular country' [F, 40].

However helpful to self-esteem it is to enact national identities, organising along such lines is unlikely to result in success in a transnational labour market.

Even when collective or regulatory power is successfully brought to bear on a microwork platform, the delocalised nature of the work means that the solution may be short-lived. In 2012, an MTurk worker filed an employment lawsuit in California against CrowdFlower, a 'transformer' company that acted as an intermediary between the MTurk platform and several end-clients. The suit obtained class action status, the class being MTurk workers who had done more than a minimal amount of work for CrowdFlower. The suit was settled in 2014 for $585,000,[1] which many workers in forum discussions considered a modest success. However, soon after the suit was filed, CrowdFlower stopped funnelling work to MTurk. It now funnels work to over 50 other platforms instead. The fact that there are so many platforms today diminishes the effectiveness of organising around any single platform.

A handful of microworkers and supporters are continuing attempts to mobilise and organise digital precariots. For example, in 2014 Canadian MTurk worker Kristy Milland organised a campaign for workers to send demand letters to Amazon CEO Jeff Bezos (Harris 2014). Somewhat ironically, one of the ways in which Milland sought to mobilise workers was by hiring them via MTurk. In the absence of effective organisation, becoming an employer is the most effective means that organisers like Milland have at their disposal.

Discussion: a Variable Geometry of Individualised Actors

What implications do the mechanisms of twenty-first century informational capitalism have for labour organising and the identities that underpin it? Insofar as those mechanisms seek to disembed and detach labour from local contexts in order to generate at each moment the most efficient production networks on the global level, the lessons learnt from

[1] http://wtf.tw/ref/otey.pdf

microwork—an extreme example of such processes—must be instructive. Following Flecker and Schoenauer (Chap. 2 of this book), it would be a mistake to understand microwork as inherently delocalised work. Instead, we saw that microwork platforms enrolled specific efforts and technologies to produce the material, social, and legal circumstances in which the work becomes relatively placeless. We saw that one net effect of these delocalisation efforts was to make it more difficult for workers to know each other and develop shared identities, trust, and solidarity, weakening the workers' bargaining position in the market. Huws and Dahlmann (2010) found similar difficulties in identity formation in other spatially restructured informational work.

These findings stand in slight contrast to some earlier work on ICT-enabled outsourcing in the context of service value chain restructuring (Davis-Blake and Broschak 2009, Flecker and Meil 2010). In these studies, the focus has been on issues of trust, power, and identity between geographically distinct work sites constituting different parts of the value chain. Conflicts and contestations can arise between sites, and management can exploit these. But within sites, workers are still in close contact and often from similar backgrounds, factors that are conducive to shared identity formation. In microwork-style outsourcing, there are no work sites—time-space compression happens on the individual level. This organisational difference reflects a material difference in the form of internet access: office broadband versus domestic or mobile broadband. While individual access allows more flexibility for the worker, it also leaves them more vulnerable to being singled out and isolated by means of suitable work organisation. It is therefore important to make a theoretical distinction between work that is delocalised and subsequently partially relocalised elsewhere, and work that is delocalised and subsequently remains dispersed. Many MTurk workers live in the United States, including in its West Coast high-tech hubs. Work that is socially and organisationally dispersed does not necessarily have to move anywhere in geographic terms. What is being erased is the sense of place as a relational concept, as a nexus of political organisation and regulation. A potentially simple way to distinguish between relocalisation and dispersal empirically is to ask whether the company decided where the work should be relocated to.[2]

[2] I am indebted to Jörg Flecker for this observation.

Previous studies of the experiences of dispersed freelance knowledge workers and teleworkers working from their homes and Internet cafés have focused on relatively elite workers performing highly specialised labour such as software development and web design (Barley and Kunda 2006, Kunda et al. 2002). These technology professionals were among the first to obtain personal access to the Internet, and therefore among the first for whom delocalised work arrangements were created. Today, domestic and mobile broadband penetration around the world is starting to reach a point where a dispersed mode of work could potentially be applied to millions of undifferentiated service workers. An obvious difference between these groups is that highly specialised workers possess a degree of bargaining power by virtue of their limited numbers, whereas undifferentiated workers currently have few means beyond national regulation and collective bargaining to defend the returns to their labour. Losing the geographic nexus is of little economic consequence to the early elite adopters of dispersed work, but our findings from microwork suggest that it could be very consequential if there was to be mass adoption. This is an important implication for policy makers who have embraced domestic Internet access and personal online work as a means towards economic and social development (World Bank 2012, World Bank 2013, Raja et al. 2013).

We saw that ICTs are also being used to reconnect workers, counter organisational dispersal, and build 'virtual places' or online substitutes to the missing geographic nexus. In these places, workers enact shared occupational identities and even class identities in the sense of expressing shared interests against unfair employers. However, the actual collective actions that stemmed from these places were modest in scale and it was difficult to find evidence of effectiveness. This relative failure to perform effective collective bargaining can be traced to the topology of the workers' online formations and identities. Conventional unions are usually organised around specific skill sets or employers, with the aim of obtaining market power by regulating the supply of labour in that particular market segment (Streeck 2005). In contrast, workers' online formations are not necessarily organised around any particular market segment. Their membership composition is more arbitrary and incidental, shaped as it is by search

engine and recommendation algorithms, personal social networks, and sub-cultural splits within the worker communities. This leaves the groups in a weak bargaining position against any specific employer or industry. The most systematic basis of organising seemed to be national identity. But as traditional unions have experienced, organising along national boundaries may not be effective in a delocalised labour market.

Finally, a more fundamental issue in organising dispersed workers is that such workers can come from very different socio-economic circumstances, and may thus have rather divergent interests. For example, we saw that American workers expressed more concerns about pay than Filipino workers, and Nepalese student workers who only worked to earn pocket money expressed few concerns at all. Many of the workers now used by CrowdFlower may not see themselves as 'workers' at all: many are online shoppers earning discount tokens by completing a few simple tasks, or online gamers collecting virtual currency, with little interest in labour struggles. Moreover, microwork platforms and other online labour markets have also produced what could be called a dispersion of employment: many of the employers buying informational labour through these markets are small start-up companies and individuals, such as researchers and graduate students. One moment they are hiring, the next moment they may be acting as workers themselves.

Given the dispersion of roles and identities in the microwork labour market, it is not clear to what extent it makes sense to continue to approach these markets using a binary model, where workers and capitalists struggle over the allocation of returns to their respective factors of production. In analyses of dispersed work, we might instead draw on Castells (1996), who suggests that in the informational sector, the binary conflict between capital and labour is replaced by a 'network economy': a 'variable geometry' of individualised actors, constantly included and excluded on the basis of their ability to contribute. Instead of a binary conflict, it features complex and variable patterns of differentiation, collaboration, and exploitation, which must each be analysed separately.

References

Allan, P., & Sienko, S. (1998). Job motivations of professional and technical contingent workers: Are they different from permanent workers? *Journal of Employment Counseling, 35*, 169–178.

Ashford, S. J., George, E., & Blatt, R. (2007). Old assumptions, new work: The opportunities and challenges of research on nonstandard employment. *The Academy of Management Annals, 1*, 65–117.

Barley, S. R., & Kunda, G. (2006). *Gurus, hired guns, and warm bodies: Itinerant experts in a knowledge economy*. Princeton: Princeton University Press.

Castells, M. (1996). *The rise of the network society*. Malden, MA: Blackwell.

Castells, M. (2000). Materials for an exploratory theory of the network society. *British Journal of Sociology, 51*(1), 5–24.

Cherry, M. (2010). The global dimensions of virtual work. *Saint Louis University Law Journal, 54*, 471–496.

Davis-Blake, A., & Broschak, J. P. (2009). Outsourcing and the changing nature of work. *Annual Review of Sociology, 35*, 321–340.

Durkheim, E. (1997). *The division of labor in society*. New York: Free Press.

Dutton, J. E., Dukerich, J. M., & Harquail, C. V. (1994). Organizational images and member identification. *Administrative Science Quarterly, 39*, 239–263.

Flecker, J., & Meil, P. (2010). Organisational restructuring and emerging service value chains: Implications for work and employment. *Work, Employment & Society, 24*(4), 680–698.

Graham, M. (2013). Geography/internet: Ethereal alternate dimensions of cyberspace or grounded augmented realities? *The Geographical Journal, 179*(2), 177–182.

Harris, M. (2014) Amazon's mechanical Turk workers protest: 'I am a human being not an algorithm. *The Guardian*. December 3. http://www.theguardian.com/technology/2014/dec/03/amazon-mechanical-turk-workers-protest-jeff-bezos

Ho, K. C., & Zaheer, B. (2002). 'Sites' of resistance: Alternative websites and state-society relations. *British Journal of Sociology, 53*(1), 127–148.

Huws, U., & Dahlmann, S. (2010). New forms of work: New occupational identities. In N. Pupo & M. Thomas (Eds.), *Interrogating the 'new economy': Restructuring work in the 21st century* (pp. 65–92). Toronto: University of Toronto Press.

Huws, U., Dahlmann, S., Flecker, J., Holtgrewe, U., Schönauer, A., Ramioul, M., et al. (2009). *Value chain restructuring in Europe in a global economy*. Leuven: HIVA.

Ipeirotis, P. (2010) Demographics of mechanical Turk. *NYU Center for Digital Economy Research Working Papers* CeDER-10-01. http://hdl.handle.net/2451/29585

Irani, L. (2013) The cultural work of microwork. *New Media and Society*. Published online before print, doi: 10.1177/1461444813511926.

Irani, L. and Silberman, M. S. (2013) *Turkopticon: Interrupting worker invisibility in Amazon Mechanical Turk*. Proceedings of the ACM conference on human factors in computing systems (CHI). New York: ACM.

Karpf, D. (2010). Online political mobilization from the advocacy group's perspective: Looking beyond clicktivism. *Policy & Internet, 2*(4), 7–41.

Kingsley, S. C., Gray, M. L. and Suri, S. (2014) Monopsony and the crowd: Labor for lemons? Paper Presented at Internet, Politics, & Policy 2014 Conference, Oxford, UK, September 18–19. http://ipp.oii.ox.ac.uk/sites/ipp/files/documents/Monopsony_and_theCrowd_SCK_MLG_SS.pdf

Kittur, A., Nickerson, J., Bernstein, M. S., Gerber, E., Shaw, A., Zimmerman, J., Lease, M., and Horton, J. J. (2013) The Future of Crowd Work. Proceedings of the ACM Conference on Computer Supported Cooperative Work (CSCW) 2013 (1301–1318). New York: ACM.

Kunda, G., Barley, S. R., & Evans, J. A. (2002). Why do contractors contract? The experience of highly skilled technical professionals in a contingent labor market. *Industrial and Labor Relations Review, 55*, 234–261.

Lehdonvirta, V., & Ernkvist, M. (2011). *Knowledge map of the virtual economy*. Washington, DC: World Bank.

Lehdonvirta, V., & Räsänen, P. (2011). How do young people identify with online and offline peer groups? A comparison between UK, Spain and Japan. *Journal of Youth Studies, 14*(1), 91–108.

Marx, K. (1906). *Capital*. New York: Modern Library.

McLean Parks, J., Kidder, D. L., & Callagher, D. G. (1998). Fitting square pegs into round holes: Mapping the domain of contingent work arrangements onto the psychological contract. *Journal of Organizational Behavior, 19*, 697–730.

O'Reilly, T. (2013). Open data and algorithmic regulation. In B. Goldstein & L. Dyson (Eds.), *Beyond transparency: Open data and the future of civic innovation* (pp. 289–300). San Francisco: Code for America Press.

Raja, S., Imaizumi, S., Kelly, T., Narimatsu, J., & Paradi-Guilford, C. (2013). *Connecting to work: How information and communication technologies could help expand employment opportunities*. Washington, DC: World Bank.

Riketta, M. (2005). Organizational identification: A meta-analysis. *Journal of Vocational Behavior, 66*, 358–384.

Riketta, M., & VAN Dick, R. (2005). Foci of attachment in organizations: A meta-analytic comparison of the strength and correlates of workgroup versus organizational identification and commitment. *Journal of Vocational Behavior, 67*, 490–510.

Rock, K. W., & Pratt, M. G. (2002). Where do we go from here? Predicting identification among dispersed employees. In B. Moingeon & G. Soenen (Eds.), *Corporate and organizational identities* (pp. 51–71). London: Routledge.

Ross, J., Zaldivar, A., Irani, L., and Tomlinson, B. (2009) Who are the turkers? Worker demographics in Amazon Mechanical Turk. Social code report 2009–01. http://www.international.ucla.edu/media/files/SocialCode-2009-01.pdf

Ross, J., Irani, L., Silberman, M. S., Zaldivar, A., and Tomlinson, B. (2010) Who are the Crowdworkers? Shifting Demographics in Mechanical Turk. In *Extended Abstracts of the ACM Conference on Human Issues in Computing Systems* (*CHI 2010*), (New York: ACM), 2863-2872.

Scholz, T. (Ed.) (2013). *Digital labor: The Internet as playground and factory*. New York: Routledge.

Sluss, D. M., & Ashforth, B. E. (2007). Relational identity and identification: Defining ourselves through work relationships. *Academy of Management Review, 32*(1), 9–32.

Steinkuehler, C. and Williams, D. (2006) Where everybody knows your (screen) name: Online games as 'third places'. *Journal of Computer-Mediated Communication*, 11(4), http://jcmc.indiana.edu/vol111/issue4/steinkuehler.html

Streeck, W. (2005). The sociology of labor markets and trade unions. In N. Smelser & R. Swedberg (Eds.), *The handbook of economic sociology* (pp. 254–283). Princeton: Princeton University Press.

Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social Psychology Quarterly, 63*(4), 284–297.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Chicago: Nelson-Hall.

Thatcher, S. M. B., & Zhu, X. (2006). Changing identities in a changing workplace: Identification, identity enactment, self-verification and telecommuting. *Academy of Management Review, 31*(4), 1076–1088.

VAN Knippenberg, D., & VAN Schie, E. C. M. (2000). Foci and correlates of organizational identification. *Journal of Occupational and Organizational Psychology, 73*, 137–147.

Wells, C. (2014). Civic identity and the question of organization in contemporary civic engagement. *Policy & Internet, 6*(2), 209–216.

Wiesenfeld, B. W., Raghuram, S., & Garud, R. (1999). Communication patterns as determinants of organizational identification in a virtual organization. *Organization Science, 10*, 777–790.

World Bank (2012). *Information and Communications for Development 2012: Maximizing Mobile*. Washington, DC: World Bank.

World Bank (2013). *Feasibility study: Microwork for the palestinian territories*. Washington, DC: World Bank.

Part II

The Changing International Division of Labour and Regional Development

5

‘Clouds’ in the Desert? Central and Eastern Europe and Ukraine in the New Division of Labour for Business Services and Software Development

Jane Hardy and Graham Hollinshead

Introduction

In the post-communist countries of Central and Eastern Europe (CEE) after 1990, foreign direct investment (FDI) was viewed as a key driver of the transition to a market-based economy and integration with the global and European economies. However, an extensive literature has critically addressed the assumption that foreign firms would bring much needed capital and have the propensity to transfer advanced technology and management techniques (Hardy 1998, 2006; Pavlinek and Smith 1998; Drahokoupil 2008; Fifekova, 2008a). Attention has now shifted to the increasing importance of offshoring in the service sector as a key driver of the globalisation process. Much has been written on the implications of relocating business services from the sender country perspective, in particular, focusing on job loss, welfare implications and efficiency gains. However, with the exception of India and Ireland, little consideration has been given to offshore destinations and even less to the impacts of this emerging trend in foreign investment in the new receiver countries of CEE from 2000 onwards.

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The contribution of this research needs to be understood in the context of two competing claims as to how the economies of post-communist New Member States (NMS) and countries such as Ukraine might fit into the emerging international division of labour. The first view is that these economies will benefit from the fragmentation of the value chains of large transnational corporations (TNCs), which will enable them to upgrade on the basis of high levels of human capital and technical capacity (Kaminski and Smarzynska 2001). A less sanguine view is that they are tentatively linked by a few outposts of foreign capital and integrated only marginally into Western production systems and minimally into innovation systems (Martin 1998). These debates are thrown into sharp relief by the changing nature of offshoring and outsourcing in the service sector.

Until recently the presence of TNC service providers in other countries was motivated by performing activities for the local market which demanded a degree of firm embeddedness (Dossani and Kenney 2007), including services such as banking, insurance, law, consulting and accountancy. By the late 1990s the situation had changed profoundly when changes in technology, how work is organised and new sources of skilled workers—meant that service work, previously considered to be immune from relocation, also became tradable (Feuerstein 2013, Aspray et al. 2006). The 'light' and electronically transmittable nature of financial products has permitted the reorganisation of productive activities into international 'financial factories' with scant regard for national borders (Martin 1999). These low-value-added jobs included call centres, data entry, claims processing and medical transcription (Bain and Taylor 2005). Furthermore, attention has turned to offshoring and outsourcing, not only routine business services, but also those that engender high skills and knowledge (Guzik and Micek 2008). However, interpretations of this trend are contested. Some suggest that there has been an acceleration in the offshoring of more skilled tasks such as R&D, sophisticated software development, design mathematics-based finance and actuarial functions that require post-graduate or higher level skills. A less sanguine view from the perspective of receiver countries of business service FDI suggests that knowledge-based functions will remain in the core economies, while simplified and routinised tasks in production and the provision of services will be outsourced and offshored to emerging markets (Hutton 2004).

The regional patterns of this relatively new phenomenon of offshoring are, however, ambiguous; for example, a few large investments in less-developed urban areas could lead to the substantial reconstruction of the hierarchy of cities. Further, the increase in offshoring may result in the reduction of regional income discrepancies, as less-developed places attract a growing bulk of routine activities (Richardson and Gillespie 2003; Robert-Nicoud 2008). Therefore offshoring associated with relocation is a spatial phenomenon and is shaped by, and shaping, complex geographical forms which have profound implications for regions and cities of CEE as emerging destinations for business service foreign investment (Aggarwal et al. 2008).

The footloose nature and placelessness of the delivery of business services and IT raises questions as to the benefits that can be brought to the countries, regions and localities within which they are (re) located. Conceptually this draws on the notion of territorial embeddedness (Hess 2004). This considers the extent to which there is a complex interplay between incoming economic activities with firms, institutions and economic actors in the location, with consequences for the extent that the production of a good or service is 'anchored' or sticky in one place. The relevance of this is that the higher the degree of embeddedness, the greater the propensity of the activity or firm to be fixed in one location with potential advantages in terms local multiplier effects, higher quality employment and technology transfer contributing to the upgrading and development of the locality. The main focus of this chapter is to investigate the territorial embeddedness of offshoring business services to CEE and IT programming to Ukraine through the lenses of the network, institutional and cognitive-cultural dimensions of embeddedness.

The chapter draws on two sets of data. The first project conducted 25 semi-structured interviews with the senior managers of business service related FDIs in three NMS of the EU: Hungary, Slovakia and the Czech Republic (see Hardy et al. 2011). The largest firms were included in the sample of all three countries. The interviews covered firms that accounted for 16 per cent of employment in business services in Hungary, 25 per cent in the Czech Republic and 50 per cent in Slovakia. The second project is based on 12 semi-structured interviews that were

conducted with CEOs or senior managers of companies based in Europe and the United States that offshored software development to the Ukraine (see Hardy and Hollinshead 2011).

The next section outlines the context and background of the investments in services in the Ukraine and CEE. This is followed by a section that proposes a conceptual framework that focuses on the network, cognitive-cultural and institutional dimensions of embeddedness in order to explore the territorial embeddedness. The remainder of the chapter discusses the data through these lenses.

Background and Context of the Research

Foreign investment in business services in CEE took place in two distinct stages. In the first stage, demand-led investments arrived from 1990 onwards at the beginning of the transformation period, when oligopolistic consultancy firms tried to gain first-mover advantage and establish market share by providing services that were hitherto unavailable. From 2000, the second stage of foreign direct investment in the business services sector was dominated by companies offshoring specific services such as back-office and corporate functions, customer care and IT support. It was not only that the number of projects grew significantly, but that the size of these investments included large projects which employed thousands of workers in newly opened sites (Fifekova, 2008b; Sass 2008; Trnik 2008). In some cases, these service functions were transferred from other, usually Western European, locations. In others these were newly established centres serving new markets.

Since 2004, there has been an acceleration in the offshoring of more skilled tasks such as R&D, sophisticated software development, design, mathematics-based finance and actuarial functions that require postgraduate or higher level skills. The empirical focus of this chapter is on the offshoring of software development to the Ukraine and business services to CEE. Ukraine has emerged as a new site for sophisticated IT functions, with its perceived attractiveness lying in its legacy and culture of research. This emanates from having the largest and oldest cybernetics centre in the former Soviet bloc, with the related production of

highly-qualified graduates in mathematics and theoretical physics relying heavily on IT technologies. Ukraine is economically and politically peripheral, on the edge of the European Union, and a contested territory. Further, with low levels of foreign direct investment, it is weakly integrated into global flows of capital and in this context offshoring offers the potential for regional growth and dynamism. This is particularly pertinent for major cities, which may benefit from the capture of high level functions in the value chains of software development.

The attractiveness of Hungary, the Czech Republic and Slovakia lies in an abundance of skilled and highly educated workers who can be employed on lower salaries than those that pertain in the core countries of the European Union. Moreover, membership of the European Union since 2004 ensures consistency regarding legal and business frameworks. Further, the appeal of these countries as a site for offshoring lies in their geographical and cultural proximity.

Conceptual Framework

The concept of embeddedness underpins a theoretical account whereby firms are spatially entangled in webs of social relationships, which take cognitive, cultural and social forms (Granovetter 1985; Zukin and DiMaggio 1990). This notion emphasises the relationship and interaction between different economic agents and institutions which are continually constructed and reconstructed, and it attempts to capture the wide variety and complexity of linkages, in all their social, political and economic dimensions (Grabher 1993). In particular, the notion of territorial embeddedness (Hess 2004) is central to this chapter in relation to exploring the extent to which linkages develop between incoming offshored activities within a particular locality or region.

In order to understand the territorial embeddedness of investment in business services and software development in receiver countries, and specifically the impacts of offshoring, three salient dimensions of embeddedness that influence territorial embeddedness are considered. First, the network dimension, which contextualises activity in the wider value chain and the distinctive features of the sector; second, the

Table 5.1 Dimensions of embeddedness influencing territorial embeddedness

Dimensions of embeddedness	Influences
Network dimensions of embeddedness	Low cost versus knowledge seeking Place in value chains/network Temporality of product
Cognitive-cultural dimensions of embeddedness	Demands for specific labour and skills Accessing tacit knowledge internally Know-how of crossing boundaries
Institutional dimensions of embeddedness	Role of national and local government institutions Path-dependent informal institutions Agglomeration and tacit knowledge

Source: Authors

interrelationship of the cognitive and cultural influences as firms try and leverage specific skills and knowledge; and thirdly, institutional embeddedness are considered. These are summarised in the taxonomy in Table 5.1 and the remainder of the section goes on to elaborate these three dimensions.

The *network dimension* of embeddedness is comprised of three strands. The first relates to the motive for offshoring in terms of whether it is low-cost or knowledge-seeking. Firms locating on the basis of low labour costs, locking firms into low-value-added operations have been assumed to bring fewer benefits than 'bridgehead' investments associated with market access or knowledge-seeking which may demand a wider range of quality functions (Grabher 1992). In the case of the latter, it is assumed that they are more likely to bring qualitatively superior employment opportunities that involve training and development and will enhance the human capital of the region.

The second strand of network embeddedness examines the role played by intra- and interfirm relationships. The extensive literature on value chains enables an examination of the extent and implications of the location of higher-value-added functions and decision-making operations as well as the power relationships within value chains (Christopherson and Clark 2007; Coe et al. 2004, 2008; Gereffi 1996; Gereffi et al. 2005). Accounts of network embeddedness have suggested that the place of

an operation in the value chain in terms of the functions it performs, and its degree of autonomy, has important implications for its impact on a locality (Humphrey and Schmitz 2002; Smith et al. 2002) as the locus of control and asymmetries of power within Global Production Networks (GPNs) affect its ability to upgrade assets and competences (Christopherson and Clark 2007). This affects the growth potential of new and existing indigenous firms (positive feedbacks) or the reinforcement of existing power relationships as TNCs 'crowd out' potential local competitors (negative feedbacks).

The third theme of network embeddedness refers to temporality, in terms of the level of sunk costs which influence the time frame and degree of mobility of an investment in a locality and the volatility of demand for a product. Where demand for a product is more stable, an activity in a place is likely to be more embedded over time.

The *cognitive-cultural dimension* focuses on the need for firms to access specific skills and particular categories of labour. Further, it refers to how firms restructure their internal organisations to elicit tacit knowledge embedded in employees at all levels of the firm's structure. It has been argued that traditional hierarchical structures represent a block on learning and innovation. Moves towards less hierarchical structures and networked relationships between different divisions have been interpreted as opening up the possibility for firms to be more deeply embedded in localities. Given that there is no one best way, this may lead to different modes of work organisation and firm strategies, which has implications for the quality of employment in terms of salaries, working conditions, stability and autonomy (Feuerstein 2013).

A further element of literature relates to entering new contexts, whereby incoming firms have to negotiate with, or around, established behaviours and understandings in order to become more responsive and react quickly to changes in the market. In other words, as firms cross national boundaries they need to introduce and establish new material and discursive practices in their firms through restructuring management practices and changing established business habits and practices (Hardy 2006). Therefore, there are important organisational considerations relating to entering new markets and acquiring assets, impinging on how

to manage operations over wider geographical areas embracing different institutional and cultural legacies.

There is an *institutional dimension* to embeddedness in that the intensification of competition has led to firms needing to be embedded in localities in order to access tacit knowledge that is central to the new competition. It follows that this demands an enhanced role for local and regional authorities in providing the appropriate physical infrastructure and institutional 'cement' in which to embed firms (Malmberg and Maskell 2006; Bathelt et al. 2004). The importance of institutions in the locality extends beyond the role of the local state, to what Amin and Thrift (1995) refer to as 'institutional thickness', which is defined as '…a plethora of institutions of various kinds (including local chambers of commerce; training agencies; trade associations) … which can provide a basis for the growth of particular local practices of local representation' (Amin and Thrift 1995: 14).

The existence of these institutions is a necessary, but not sufficient, condition to embed firms, and, according to this view, these bodies need to be cemented by cooperation, frequent interactions, trust and cohesion. Beyond non-state formal institutions, the extent and nature of linkages of foreign investors will be shaped and mediated by the predominant formal institutions of the host economy. While these might include the legal framework and regulatory structures concerning competition, ownership and labour, also of relevance are informal institutions and, in particular, the prevailing collective understandings about the nature of economic action.

The 'strategic coupling' (Coe et al. 2004) of firms and institutions can be broadly understood as 'institution enhancing' or 'institution harnessing', which are not dichotomous or mutually exclusive categories. Institutional enhancement emphasises the way in which the arrival and presence of FDI results in upgrading the institutions of local governance. This could include, for example, the introduction of new formal organisations of business (chambers of commerce) or qualitatively superior interactions between local or regional government as they increase their sensitivity to the needs of business. Institution harnessing refers to the way in which formal institutions are captured to secure the necessary infrastructure, regulatory frameworks and legal permissions conducive to minimising the cost and maximising the efficiency of the

operation of firms (Phelps, 2000). To these two categories we can add a third, namely the strategy which refers to institutional avoidance, whereby firms completely eschew relationships and see them only in negative terms.

Network Dimensions and Impacts

Drawing on the dimension of network embeddedness, this section analyses the impacts of offshoring through the specific themes of low costs versus knowledge-seeking; denoting place in the value chain or network and temporality.

Low Costs Versus Knowledge Seeking

Offshoring business services to CEE and software development to Ukraine were both motivated by seeking skills and skilled workers at lower wages. In the case of CEE, countries were also selected on the basis of possessing specific language skills necessary to service the region. For example Hungary has an advantage because members of Hungarian minorities from neighbouring countries take up work in these centres and speak at least two 'small and exotic' languages.

In CEE, simple dichotomies of low or high skill were not helpful and the data suggested that offshored business services encompassed diverse activities across the full spectrum of skills. At the low end of the skill spectrum, back-office functions were evident, which included data entry, and data processing, while work associated with corporate functions demanded a higher level of skill. For example, a call centre can provide basic information in one language, and more comprehensive information in multiple languages, for example one firm offered services in 20 languages. As a concomitant, between 80 and 90 per cent of employees engaged in this centre possessed a university degree and the majority of them spoke more than one foreign language.

In the case of Ukraine, the overriding attractiveness of this location was cited as the ability of firms to leverage high level knowledge at a

relatively low cost. The standard of technical education was deemed to be exceptionally high with an extensive pool of potential employees emerging from three higher education institutions and universities (estimated at 12,000 graduates a year). In particular, these Ukrainian graduates were perceived as having high level mathematical and computational skills, which was a legacy of the knowledge that had been central to the defence industry before 1990.

However, in the case of both CEE and Ukraine, cost advantages were not always sustained and there was negative feedback on labour markets as competition for employees with suitable skills increased. The shared service centres in CEE dramatically increased the demand for new university graduates from 2002 onwards and, in particular, those with good language skills. The first centres entering the market had no problem with the availability of suitable candidates, but following several large investments in service centres, the competition on the labour market increased. A shortage of specific skills emerged with respect to languages, IT and application specialists.

In the CEE case study countries, the increased competitiveness of the market for the required skills created pressure for companies to increase wages, invest more in the education and training of employees and offer more benefits. Between 2005 and 2008 wages increased by ten per cent annually in the three CEE countries. Over the same period, attrition rates were close to 20 per cent, but the turnover of employees fell as unemployment increased and opportunities on the job market contracted since the 2008 recession.

The relocation of software development has taken place in a series of waves. However, as companies started to offshore to a particular country there was a process of wage inflation, as had been observed in Ukraine. It was reported that the wage cost of a software developer had risen from $450 in 2004 to $1500 by 2008. As wage costs increased in one country, then lower cost destinations were sought and therefore comparative advantage was relatively short-lived. Some of the software companies were not considering other destinations, whereas others were continually searching for the next low cost destination with Vietnam, South America and Nigeria identified as countries that were potential sites for offshoring.

Place in Network/Value Chain

In both CEE and the Ukraine, the activity carried out lay at the bottom of value chains and the final 'service' product was exported. In the case of software development in Ukraine, software users in non-software companies occupied the top of the value chain. These included firms across all sectors from retail to finance who demanded customised development for complex and proprietary systems and the maintenance and updating of those systems. Software development functions were then outsourced to large service firms, or in the case of Ukraine, to software-intensive high technology start-ups in Europe and the United States, where they were all headquartered. The order came from the client who retained the intellectual property (IP) rights, and all primary business functions were located in the home country, including human resource management, finance, marketing, sales and contact with the client.

In CEE case study countries the data from the firms reported that between 95 and 100 per cent of services produced were exported and were primarily aimed at serving European or global networks. Therefore product markets were dominated by foreign firms with local firms existing only in niche markets or serving local Small and Medium Enterprises (SMEs). Activities undertaken by captive and independent firms, constituted a small part of the value chains of global and European networks. The governance of value chains therefore lay outside of the region. The country of origin of foreign investors was primarily the United States (14 firms) and the core economies of the European Union (eight firms). 19 of the firms were captive and part of intra-firm networks, and seven were independent, usually serving other large TNCs. The locus of control lay outside the host country, with implications for the permanence and time horizon of these activities in the region. This was dependent on their ability to deliver relatively low wage costs, a continuous supply of suitable skilled workers and their provision of niche skills, and, in particular, linguistic ability.

In CEE, there were limited opportunities for 'forward' and 'backward' linkages. Client-supplier cooperation between companies was usually agreed at the global level between the parent company and other large TNCs. Therefore when these investments entered the host market, the relationship between customers and supplier was largely pre-determined.

Foreign companies exported the majority of their services and the scope for backward linkages was limited.

Temporality

Both business services offshored to CEE and software development to the Ukraine, were highly mobile, because with no expenditure on equipment or property, 'sunk costs' were minimal. There was a stable demand for the services provided, and scope for further wage arbitrage between countries and within Europe was limited.

Software development showed a much greater propensity for relocation, and one respondent argued that 'every country in the world is a possible site for software development'. The fast changing nature of networks meant that they took on a kaleidoscopic quality in that the sector was characterised by turbulence in terms of the life-span of companies, and evident in the continual cycle of dissolving companies and the opening up of new ones, often by the same managers. Many of these high technology start-ups were funded by venture capital, some on the basis of one product. If the product was unsuccessful then the firm became defunct. The existence of projects where tasks had an 'end point', or 'institutionalised termination', served to further increase instability, and therefore the transient nature of projects blurred the neat formal (inter-) organisational arrangements.

At a general level, this turbulence reduced the embeddedness of firms; however, there were examples of where it presented an opportunity for local firms. For example, in one case, Ukrainian employees made redundant from one firm formed their own company and became subcontractors to the firm they had previously worked for.

Cognitive Dimensions and Impacts

In CEE, the direct upgrading of human capital and local learning were evident as all firms provided training and development for their employees. While some firms concentrated on knowledge and abilities directly connected to the demands of the task, others offered wider

development training, for example language and self-development courses. Human capital spillovers take place if employees trained in foreign companies move to local companies, or set up their own firms. In the sample, employees trained in foreign companies usually left to join other foreign companies, thereby limiting the scope of learning and knowledge spillovers to local firms. Therefore, learning and knowledge took place within a 'closed-circuit' with virtually no leakages. While the competitiveness of human capital was enhanced, the transfer and diffusion of skills was limited. The majority of local firms were unable to compete in terms of the scope and quality of such services, but could only offer cheaper and more specialised services adjusted to local conditions and local companies.

Managers of software development offshoring activities emphasised the need for flexibility in adapting to quickly changing environments, as different strategies to lever tacit knowledge through their organisational structures and management of human resources were exhibited. This is illustrated by the contrasting strategies of two firms.

The CEO of Heavensent argued that the process of producing software for a non-technical final user could not be reduced to simply sending a specification for code and then retrieving it. A close relationship between the offshoring firm and programmers and developers in Ukraine was demanded and reflected in constant communication within the firm, aimed at engendering commitment and value-setting. In the case of Heavensent there were daily meetings using video conferencing where each team or group gave a summary of project development, in order to chart progress and exchange information. It was suggested that good collaboration was made up of a 'string of small conversations' and a culture of daily interaction on small issues.

Further, it was necessary to engender commitment as a way of 'getting the best' out of the employees and reducing turnover. The importance of integrating the company across national boundaries and making employees feel 'part' of the firm was a central part of their management of human capital. Giving developers and programmers interesting work was regarded as central to reducing turnover and maintaining commitment. In addition, mining tacit knowledge required a strong corporate culture through value-setting, which included trying

to encourage ideas about creativity, transparency in decision making and work-life balance.

Extrembyte lay at the other end of the spectrum and explicitly described itself as a hierarchical organisation. Critical to the way in which it managed software engineers was the instigation of a task accounting system it had developed for itself.

> *people can walk in walk out see what needs to be done … get the code … download it, work on it and upload it again … it can be done anywhere … they could be on a beach in Tahiti if they wanted to be. The entire company is virtual there is no company in the US either. Our costs of doing business are as minimal as possible.*

This project management system meant that the company could track the work, the clients, and also insert new people and monitor how long the work was taking, thereby minimising face-to-face contact. The CEO had never met any of the team in the Ukraine over an eight year period and video conferencing was considered to be gratuitous and oral communications 'simply a waste time'.

> *These people are here to get a job done, they don't care what we look like and we don't care what they look like … We track them by the numbers, we estimate in advance how long each task should take, and if a programmer is consistently taking longer to do a task, then we let them go.*

These two business models had implications for the embeddedness of firms. In the first case, the need to respond to clients flexibly and quickly and develop high quality products necessitated developing skills, training and trust-building within an organisation. Firms using this model exhibited a higher degree of embeddedness and less inclination to move production, after having made an investment in human capital. In the second case, labour was treated as an undifferentiated unit of production, as production was seen as perfectly mobile between different global sites.

Institutional Dimensions and Impacts

Firms in CEE had engaged with national institutions in order to access subsidies and incentives. Hungary was the first to introduce a specific support scheme for service centres in 2003, followed by similar schemes. Until 2008, the institutional environment was broadly similar in the three case study countries. This included the offer of incentives for investment in business services, and Shared Service Centre (SSC) projects, which were considered a priority in all the three countries. Incentives included one-off support for job creation and on-the-job training, both of which were subject to minimum investment and job creation requirements, and tax reductions.

It is important to note that although some FDI service sector firms took advantage of the financial incentives provided by inward investment agencies, this was not cited in the interviews with the sample firms as a primary reason for their (re)location in the region. Broader institutional factors such as the political and economic environment and cultural proximity were cited as significant factors and government incentives were regarded as a bonus.

In CEE, institutional engagement was simultaneously institution harnessing, institution enhancing and institution bending. In the Czech Republic, Slovakia and Hungary companies participated in the development of institutions of local business through their membership of chambers of commerce, business clubs and nationally through IT and outsourcing alliances. For the firms, these associations provided an informal forum for exchanging ideas and transferring tacit and codified knowledge. Moreover, through these associations, managers of FDIs exerted institution-bending behaviour through attempts to exert pressure for changing what they regarded as certain detrimental elements of the local environment. In Hungary, for example, one company had actively lobbied through AMCHAM (American Chamber of Commerce) for the free movement of workers from Bulgaria and Romania employable in business services. One major concern of foreign investors was to establish a stable legal and regulatory environment. AMCHAM regularly

publishes position briefs on various issues such as taxation and the role of the electronics industry.

More specifically, investments were institution harnessing in both CEE and Ukraine with regard to educational institutions. Competition for suitable employees was one of the main factors that stimulated forging links with universities and other educational institutions. This was motivated by a need to fill temporary jobs, but also to recruit full-time employees from graduates. There was some evidence of more substantial relationships developing, in terms of research and development cooperation between the companies and universities, with examples of companies financing university activities. In the case of CEE, the presence and problems of these companies drew attention to deficient educational provision, as a result of which, secondary level training for future call centre employees was introduced in Hungary. Further, the Hungarian Outsourcing Association, with the help of its members, had organised a university level training course in 'service sciences', which was to be taught in five universities in Hungary. Arguably, institution harnessing and bending contributed to the enhancement of institutions to comply with the expected standards of global value chains.

With regard to Ukraine, rather than drawing on the generalised tacit knowledge from the city of Kiev, firms were specifically trying to access embodied knowledge from individual Ukrainian programmers and developers. There was no evidence of firms engaging with local institutions, and most reported a desire for institutional avoidance and distance from government. Ukrainian firms and individuals were employed as intermediaries to deal with the pervasive bureaucracy. Further, there was little contact between sub-contracting/offshoring firms. In some cases, this was a deliberate strategy as such firms regarded themselves in competition for highly skilled workers.

Moreover in Ukraine, local labour market institutions were avoided in order to maximise the mobility of the activity. It was relatively easy to downsize and/or relocate as the software developers were generally on flexible contracts or self-employed. Most professionals in Ukraine were paid in dollars after receiving a minimum wage salary in *Ribna*, with everything else being paid into an offshore bank account. Accordingly, if offshoring firms wanted to downsize, close down or relocate, they were

only obliged to pay severance on that part of salaries that was paid in *Ribna*, which rendered considerable flexibility regarding costs.

Discussion and Conclusions

The offshoring and/or outsourcing of software development to Ukraine has produced, for Kiev in particular, employment for highly skilled graduates in knowledge-intensive work. However, with virtually no sunk costs, the structural characteristics of the software industry make it highly mobile. Competitive conditions constantly drive a search for skilled labour at lower costs.

In the case of Ukraine, cognitive and cultural influences constituted an important factor impinging on the time horizon for firms operating in the country. The need for firms to engender commitment and reduce employee turnover was addressed using different strategies that had implications for the quality of work on offer and degree of embeddedness in the locality. Two contrasting approaches have been discussed, the first of which could be loosely termed as 'body shopping' where firms paid high salaries to employ programmers and developers on a short-term basis. Other firms invested more widely in training, development and range of benefits, which included permanent contracts and the possibility of travelling to the offshoring country. In this case there was evidence of the transfer of managerial skills and expertise, particularly in relation to project management in a 'customer facing' environment. Further, Ukrainian firms benefitted from spillovers in terms of quality requirements, as a result of being locked into global networks, which also provided the possibility of further customer diversification.

Territorial embeddedness was very weak in the cases examined in Ukraine. There was minimal interaction with other firms in the city and institutions beyond those that they were compelled to deal with. Rather than an industrial atmosphere in which knowledge flowed between firms, there was competition in relation to employing the best graduates. None of the firms carrying out software development had intellectual property rights and they occupied the bottom point of the value chain. Firms in the Ukraine were nodes of knowledge that formed a small part of the value

chains of TNCs. Their lack of power within the value chain meant that they absorbed the risk if the customer firm on the top rung of the chain cut back on a project or on IT development. Temporal embeddedness was short term, because the work could quickly be switched to another location, and the firms that were most cost driven continually searched for new sites. For these firms, Ukraine had provided a brief 'window of opportunity' to arbitrage wages and knowledge.

In CEE the impacts of investments were more complex, involving a broader spectrum of skills and, while some activities could be categorised as 'call centres with languages', others offered higher level non-routine work. However, graduates were desired, not because of the knowledge and skills developed from study in higher education, but specifically because of the language skills they possessed.

There are implications of such an analysis for the stability and embeddedness of employment. Investments, however, are mainly cost driven, have few sunk costs and are more predisposed to change locations quickly as factor prices alter. Further, the hierarchical, or quasi-hierarchical, governance structures of vertical investments further undermined their permanence in the region as decisions regarding the (re)location of these operations were taken elsewhere. However, these factors may be offset by the specific attributes of the region, particularly in relation to the language abilities necessary to service the European market.

The form of investment influences the scope of linkages and the potential for dynamic impacts. In terms of backward and forward linkages, offshored investments were not usually serving the local market, therefore firms were neither in a position of supplier to, or customer of, domestic companies, nor in a position of competitor, except on the labour market.

The data for both CEE and Ukraine underlines the way in which offshoring activities were largely confined to the networks of large TNCs. Circuits of knowledge and learning were closed within intrafirm networks, or within the interfirm networks of large companies which had minimal leakages.

The overall conclusion is that the offshoring of IT development to Ukraine and business services to CEE are both characterised by very limited territorial embeddedness. Both lie at the bottom of the global value chains of TNCs and occupy a peripheral place in global divisions of

labour for digital work for which they are in constant competition with other 'places'. In the case of Ukraine only firms which invested training, development and commitment in their employees had a commitment to place. In the case of the CEE case study countries stickiness in place was contingent on continued access to specialist skills at relatively low wages, rather than linkages with local institutions, indigenous firms and economic actors. Taken together the data calls into question the developmental potential of digital work for localities and regions.

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References

Amin, A., & Thrift, N. (1995). Institutional issues from the European regions: From markets and plans to socioeconomics and powers of association. *Economy and Society, 24*(1), 41–66.

Aggarwal, A., Berry, O., Kenney, M., Lenway, S. A., & Taylor, V. (2008). Corporate strategies for software globalisation. In L. Labrianidis (Ed.), *The moving frontier: The changing geography of production in labour-intensive industries* (pp. 255–280). Aldershot: Ashgate.

Aspray, W., Mayadas, F., & Vardi, Y. M. (2006). *Globalization and offshoring of software: A report of the ACM job migration task force*. Association for Computing Machinery: New York.

Bain, P., & Taylor, P. (2005). India calling to far away towns. *Work, Employment and Society, 19*(36), 123–145.

Bathelt, A., Malmberg, A., & Maskell, P. (2004). Clusters and knowledge; Local buzz, global pipelines, and the process of knowledge creation. *Progress in Human Geography, 28*(1), 31–56.

Christopherson, S., & Clark, J. (2007). Power in firm networks: What it means for regional innovation systems. *Regional Studies, 41*(9), 1223–1236.

Coe, N., Dicken, P., & Hess, M. (2008). Global production networks—Debates and challenges. *Journal of Economic Geography, 8*(3), 267–269.

Coe, N., Hess, M., Yeung, W.-C., Dicken, P., & Henderson, J. (2004). Globalizing regional development: A global production networks perspective. *Transactions of the Institute of British Geographers, 29*(4), 468–484.

Dossani, R., & Kenney, M. (2007). The next wave of globalization: Relocating service provision to India. *World Development, 35*(5), 772–791.

Drahokoupil, J. (2008). *Globalization and the state in Central and Eastern Europe: The politics of foreign investment*. London: Routledge.

Feuerstein, P. (2013). Patterns of work reorganization in the course of the IT industry's internationalization. *Competition and Change, 17*(1), 24–40.

Fifekova, M. (2008a). The case of Slovakia. Presentation at the project meeting "Foreign Direct Investment in Central and Eastern Europe: What Kind of Competitiveness for the Visegrad Four?" Hatfield, February 8–10.

Fifekova, M. (2008b) Foreign investment and spillover effects. http://alternative.sk/uploads/tx_clanok/Fifekova_RP.pdf

Gereffi, G. (1996). 'Global commodity chains: New forms of coordination and control among nations and firms in international industries'. *Competition and Change, 1*(4), 427–439.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of International Political Economy, 12*(1), 78–104.

Grabher, G. (1992). Eastern conquista. In H. Ernste & V. Meier (Eds.), *Regional development and the contemporary industrial restructuring*. London: Belhaven Press.

Grabher, G. (Ed.) (1993). *The embedded firm: On the socioeconomics of industrial networks*. London: Routledge.

Granovetter, M. (1985). Economic action and social structures: The problem of embeddedness. *American Journal of Sociology, 91*(3), 481–510.

Guzik, R., & Micek, G. (2008). The impact of delocalisation on the European software industry. In L. Labrianidis (Ed.), *The moving frontier: The changing geography of production in labour-intensive industries* (pp. 229–254). Aldershot: Ashgate.

Hardy, J., Fifekova, M., & Sass, M. (2011). Impacts of horizontal and vertical foreign investment in business services: The experience of Hungary, Slovakia and the Czech Republic. *European Urban and Regional Studies, **18***(4), 427–443.

Hardy, J., & Hollinshead, G. (2011). The embeddedness of software development in the Ukraine: An offshoring country perspective. *European Planning Studies, **19***(9), 1633–1650.

Hardy, J. (2006). Bending workplace institutions in transforming economies: Foreign investment in Poland. *Review of International Political Economy, 13*(1), 129–151.

Hardy, J. (1998). Cathedrals in the desert: Transnationals, corporate strategy and locality in Wroclaw. *Regional Studies, 32*(7), 639–652.

Hess, M. (2004). Spatial' relationships? Towards a reconceptualization of embeddedness. *Progress in Human Geography, 28*(2), 165–186.

Humphrey, J., & Schmitz, H. (2002). How does the insertion in global value chain affect upgrading in industrial clusters. *Regional Studies, 36*(9), 1017–1027.

Hutton, W. (2004, December 19) Don't weep for our lost factories. *The Observer.*

Kaminski, B., & Smarzynska, B. (2001). Integration into global production and distribution networks through FDI: The case of Poland. *Post-Communist Economies, 13*(3), 265–288.

Malmberg, A., & Maskell, P. (2006). Local learning revisited. *Growth and Change, 37*(1), 1–18.

Martin, R. (1998). Central and Eastern Europe and the international economy: The limits of globalisation. *Europe-Asia Studies, 50*(1), 7–26.

Martin, R. (1999). The new economic geography of money. In R. Martin (Ed.), *Money and the space economy*. Chichester: Wiley.

Pavlinek, P., & Smith, A. (1998). Internalization and embeddedness in east-central Europe transition: The contrasting geographies of inward investment in the Czech and Slovak Republics. *Regional Studies, 32*(7), 619–638.

Phelps, N. (2000). The locally embedded multinational and institutional capture. *Area, 32*(2), 169–178.

Richardson, R., & Gillespie, A. (2003). The call of the wild: Call centres of economic development in rural areas. *Growth and Change, 34*(1), 87–108.

Robert-Nicoud, F. (2008). Offshoring of routine tasks and (de) industrialisation: Threat or opportunity—And for whom? *Journal of Urban Economics, 63*, 517–535.

Sass M. (2008) Case studies—Hungary. Presentation at the project meeting 'Foreign Direct Investment in Central and Eastern Europe: What Kind of Competitiveness for the Visegrad Four?' Hatfield, February 8-10.

Smith, A., Rainnie, A., Dunford, M., Hardy, J., Hudson, R., & Sadler, D. (2002). Networks of value, commodities and regions: Reworking divisions of labour in macro regional economies. *Progress in Human Geography, 26*(1), 41–63.

Trnik, M. (2008) Attracting service sector FDI: The case of the Czech Republic. http://www.thinktank.cz/fdi/files/papers/Trnik-february-2008.pdf

Zukin, S., & DiMaggio, P. (Eds.) (1990). *Structures of capital: The social organization of the economy*. New York: Cambridge University Press.

6

Missing Links in Service Value Chain Analysis—Space, Identity and Inequality in Brazilian Call Centres

Martina Sproll

Introduction

The emergence of the global call centre industry reflects the dynamics of the restructuring of global value chains in the context of financialised and flexible modes of capitalist accumulation. Customised services have acquired central importance for the maximisation of profits and, at the same time, they are subject to major strategies of rationalisation. This includes the modularisation and outsourcing of services—materialised in call centres as a new organisational form and enabled by information and communication technology.

Brazil represents one of the largest locations of the call centre industry worldwide. Nonetheless, little attention has been paid so far to the Brazilian case—conceivably because offshoring locations, principally in English-speaking countries such as India or the Philippines, have more frequently been the focus in academic and public debates. By contrast, 98 per cent of Brazilian call centre services address the national (and Portuguese-speaking) market (Holman et al. 2007), showing that globalisation does not necessarily entail a transnational shift of territorial locations but rather complex spatial reconfigurations. The background for

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the emergence of Brazilian call centres, as for typical offshore locations, can be seen in the same logic as transnational restructuring and entanglements of global value chains. It is therefore interesting to analyse commonalities and differences in different territorial contexts, which can be explained not only by transnational but also by local/national configurations and embeddedness: the temporal and spatial scope of globalised production can be perceived not only as absolute categories but as a global-relational concept.

The tense and complex relationships among different scales of value chains has been of major importance for the development and discussion of concepts such as the Global Commodity or Value Chains approach and Global Production Networks. In the context of a new wave of globalisation since the 1990s, encompassing transnational fragmentation and commodification of value chains—as well as outsourcing and comprehensive temporal-spatial shifts of production infrastructures to low-cost countries—Gereffi and Korzeniewicz (1994) initiated this debate by presenting the world-system-inspired concept of Global Commodity Chains (GCC). They defined such chains as 'sets of inter-firm networks which connect manufacturers, suppliers and subcontractors in global industries to each other, and ultimately to international markets' (Bair 2005: 156). Both the GCC and the Global Value Chain approach (GVC), which places greater emphasis on the dimension of governance within the chains/networks, have been criticised for their strong bias towards industry/manufacturing of commodities and firm-based organisational analysis. Taking this critique as its starting point, the Global Production Network (GPN) approach emphasises the complex power relations within the networks and calls for social, political and spatial embeddedness to be taken into account (Henderson et al. 2002). More recently, critical analyses have included the following three aspects, which I will take up in this paper.

Firstly, accelerated processes of outsourcing and offshoring have increasingly affected the services sector. This reflects changing service relations based on financialisation and informatisation as technological and social preconditions for new forms of work organisation and control in a new time-space setting (Taylor 2010; Boes and Kämpf 2011; Flecker et al. 2013). Call centres are among the most visible expressions of this

dynamic and of the formation of global service chains in a mass market, exemplifying changes not only in production but also in consumption practices, which are embedded within a broader context of development processes in society. Global service chains thus cannot be understood without integrating the local, regional, and national context.

Secondly, a further major critique notes the failure to integrate labour into the GCC approach. As a consequence, considerable attention has been shifted to the situation of workers, who not only suffer from difficult working conditions and low wages but also play an active role in negotiating the shape of global production networks (i.e. Selwyn 2012). Nonetheless, the specific form of the labour process remains widely neglected. Few studies have attempted to bring in labour process theory (Newsome et al. 2015; Taylor et al. 2013; Lüthje et al. 2013). I argue that the analysis of the labour process—which I define as 'neo-Taylorist' in the case of Brazilian call centres—is fundamental for understanding how modularisation and outsourcing translate into precarisation and social inequalities.

Thirdly, critiques have increasingly referred to gender as a hidden category in global commodity chain analysis. The form of global value chains strongly depends on the exploitation of gender hierarchies. Pressures on wages and working conditions (which have been addressed with the term feminisation) and a gender hierarchical division of labour within the labour process and among companies, as well as the gendered social organisation of reproduction of the labour force, are highly relevant (Bair 2010; Dunaway 2014). However, very little has been said so far about the intersection of 'gender' with other categories such as class, race/ethnicity, age, and sexual orientation. The Brazilian case reveals valuable insights into an intersectional perspective.

This article discusses the complex and entangled correlations among global value chain restructuring, global-local reconfigurations related to space and scale, changes in the organisation of work and production, and related issues of inequality with regard to gender, race and class. Drawing on empirical research on the formation of call centres within banks and the outsourcing of banking services to external call centres in Brazil, this chapter explores these interrelations. In doing so, the social effects of global restructuring in the financial sector can be shown. Results are

based on an empirical study carried out in São Paulo in 2011 and 2012[1] under the auspices of the research network desiguALdades.net.[2]

Globalisation, Financialisation and the Emergence of the Brazilian Call Centre Industry

How global is the global call centre industry? The Global Call Centre Project reveals that only a minority of 14 per cent of call centres can be considered to be offshore locations: 'Call centers typically serve national rather than international markets. 86 per cent serve their local, regional, or national market' (Holman et al. 2007: 9). This is an interesting finding, as it contrasts with the public's perception of call centres being almost exclusively offshore. Despite this fact, however, it cannot be concluded that the call centre industry is primarily constituted on a national level; rather, it is an expression of the complexity and multi-scalarity of global servicing chains. The chain metaphor has been criticised for implying a linear and vertical conception, suggesting a 'sequential transformation in various stages of inputs into outputs' and thus underestimating the integration of different horizontal and vertical layers of firm interrelationships (Flecker et al. 2013: 8, see also Henderson et al. 2002). Moreover, the analyses of global commodity and value chains have been limited predominantly to the manufacturing sector (ibid.). However, more recent waves of globalisation have targeted the services sector in particular, pointing to a new dimension of modularisation, standardisation and outsourcing of work based on the development of information and communications technologies (ICT) (e.g. Huws and Dahlmann 2009). Boes and Kämpf (2011) argue that the globalisation of IT-based services shows specific characteristics and must therefore be distinguished from that of hardware. In relation to call centres it has been emphasised that the mass customisation of services is driven equally by cost-efficiency and

[1] In this qualitative study I conducted 65 expert and in-depth interviews with managers of banks and telemarketing call centres, workers in bank internal and telemarketing call centres, representatives of trade unions, NGOs and employers' associations of the banking and telemarketing sector in São Paulo in November 2011 and March–May 2012 (see also Sproll 2013).

[2] Research network on interdependent inequalities in Latin America.

customer orientation (Taylor 2010: 244f.). Given the intangible nature of services ('the globalisation of nothing', Ritzer and Lair 2009) it seems clear that servicing chains/networks tend to be more complex, intertwined and intersected. This also implies a distinct regional diversification and centring, as the Brazilian case shows.

The Emergence of Call Centres in Brazil

In reconstructing the emergence of the Brazilian call centre industry (the so-called telemarketing sector) two preconditions should be highlighted. Firstly, this new sector emerged at the end of the 1990s and grew rapidly in the course of the liberalisation and privatisation of telecommunication, when the old state-owned telecommunication enterprises—in a process analogous to that of the old industrial centres—were sold off. Secondly, and in a related process, technological changes—in particular the development of ICT—led to a comprehensive technological diffusion of internet and telephony. Both political deregulation and technological changes thus led to an enormous proliferation of telephone lines and mobile phones—that is to say, the technological preconditions for call centres.

According to the Brazilian Association of Company–Customer Relations (ABRAREC[3]) in the span of the last decade the telemarketing sector has grown at a rate of 200 per cent; in 2011 sales accounted for R$ 26 billion. Approximately 1.4 million workers attend to the impressive number of 1.5 billion calls per month, making Brazil one of the largest markets for call centres worldwide (ABRAREC 2012). Most of the telemarketing companies originated from start-ups; the new sector, however, not only grew explosively but also became concentrated at an early stage of its existence. As a result, the field of telemarketing is dominated by a few big players: Contax is the biggest company, a Brazil-based, stock-market listed multinational with about 115,000 workers (in 2012), making it the second largest private company in the country. In second place in the telemarketing sector is Atento, founded as a Spanish multinational and employing more than 85,000 workers in Brazil (own interviews, 2012). If we examine capital

[3] Associação Brasileira Das Relações Empresa Cliente.

flows and the financial markets in relation to the formation of the Brazilian call centre sector, several points deserve special emphasis in revealing its transnational dimension. The liberalisation and deregulation of the telecommunication sector implied the opening of markets to the entrance of foreign capital. For example, special segments for preferred shares were created in 2000 on the new Brazilian stock market (BM&F Bovespa), targeted at strengthening companies like the new telecommunication and call centre enterprises through investments and the valorisation of companies (BM&F Bovespa 2009). This facilitated investments and acquisitions of Brazilian companies by such firms as Portugal Telecom (Contax) and the Spanish Telefónica spin-off Atento—not coincidentally, companies headquartered in the two most important European colonial powers in Latin America. This fact suggests the still-prevalent colonial legacies at stake, influencing the formation of transnational production and servicing networks.

Both companies have become global players themselves. Contax, for example, has acquired several big players in the Latin American call centre market, such as the Argentina-based company Allus, thus placing dozens of locations at its command in countries including Argentina, Colombia and Peru, as well as offshoring locations in the United States, Chile and Spain. In the last few years major reorganisations of the original capital holders can be observed: in 2013 Portugal Telecom withdrew capital from the call centre operation of Contax, concentrating its business in telecommunication (the Brazilian telecom provider Oi). Telefónica, due to its critical economic situation, sold the profitable business process outsourcing (BPO) division Atento to Bain Capital, a US investor. This is not only an impressive example of time-space compression (Harvey 1990) but also indicates the need to question perspectives on the formation of global production/servicing networks limited to the global North. On the one hand, Brazil—as one of the important economic powers of the BRICS[4]-countries—is a target of transnationalisation strategies of big players from the global North, but at the same time the country forms a new centre of servicing networks itself, taking advantage of the abundant supply of low-wage call centre agents in its own labour market and shifting operations towards near- and offshore locations. At the same

[4] BRICS is an acronym referring to the association of five major emerging economies: Brazil, Russia, India, China and South Africa.

time, given the saturation of the Indian or Philippine call centre markets, Latin America and Eastern Europe are now offering alternatives for offshoring from European countries.

Sectoral Logics and Changing Service Relations

A second argument, which illuminates the transnational dimension of the nationally oriented Brazilian call centre market, refers to the intermediate position of call centres in the value-adding process. As Taylor has argued, call centres should not be seen as self-standing worksites but are driven by complex processes of restructuring of economic environments through deregulation and financialisation in different sectors, above all in financial services (Taylor 2010). Referring to the UK, he highlights intensified competition and unprecedented merger and acquisition activities and perceives call centres as a consequence of this process, aimed at ensuring competitive advantage: 'Having become a strategic imperative in financial services, telecom, and utilities, the template was adopted throughout the private sector and increasingly the public sector into the 2000s' (ibid.: 252). Whereas, on the one hand, call centres have become institutionalised as independent sectors within national legal frameworks and as a reference for the collective agency of employers and of trade unions, on the other hand they have to be understood as intertwined with different sector logics. If we look at the Brazilian case we find a similar situation. Brazilian telemarketing companies provide services to contractors from the most diverse economic sectors, reflecting a very high level of outsourcing as a general trend in Brazil—ABRAREC (2012) indicates an impressive level of 37 per cent, corresponding to expenses of an estimated R$ 10.96 billion (ibid.). The financial sector is one of the most important contractors of call centre services in Brazil—according to ABRAREC 60 per cent of the above-mentioned 1.5 billion calls a month are associated with the financial sector (banks and insurance).[5] In fact, restructuring in the Brazilian banking sector follows the above described pattern of an exclusively market-driven orientation. Liberalisation of

[5] According to the Global Call Centre Project, financial services make up a large part of call centre services worldwide (Holman et al. 2007).

the Brazilian financial system during the 1990s entailed an extensive adoption of international benchmarks such as mergers and acquisitions through privatisation and the entrance of foreign banks, leading to a pronounced market concentration. Corresponding adjustments of organisational structures and the orientation towards 'shareholder value' accompanied a significant redefinition of the profile of the operative business of banks. This profile includes a new focus on capital markets as well as an unprecedented level of purely speculative activities, a multiplied diversification of financial services and the development of a series of new financial products (Jinkings 2004: 211–212, Sproll 2013). The diversification of financial services involves a virtually unlimited process of outsourcing and subcontracting which goes far beyond simple decisions to externalise less-qualified and less-strategic activities. Moreover, outsourcing leads to a decoupling of material and immaterial production processes as a consequence of a new regime of finance-led accumulation and subsequent changes in customer relations. Call centres are the new organisational expression of this changed service relation, enabled by the digitalisation of work. According to Frenkel et al., 'product and (service) customisation, attendant on rising customer incomes, market heterogeneity […], and company policy have further encouraged managers to place greater importance on customer relations and the contribution of front-line workers to customer satisfaction' (Frenkel et al. 1999: 4). Of course, changing service relations are not only confined to call centres but include other forms as well. Automation also plays a crucial role, as evident, for example, in the significant increase in Brazilian electronic bank branches equipped with automatic teller machines. Moreover, banks have intensified the use of internet banking and mobile banking as the latest means of rationalising and computerising bank business.

These technological and organisational changes imply deep cultural changes in society as they impose and presuppose a comprehensive knowledge and ability on the part of private customers in handling computers, information technology and the administration of bank accounts. This points to an important fact and still-neglected link in servicing chain analysis: the formation of global servicing chains as a consequence of a new finance-led regime of accumulation can only be understood through an integration of the consumption side as well. The Brazilian case is particularly interesting in this respect because of profound societal changes

which imply growing inclusion of the poorer segments of its population into the 'world of consumption'. This results not only from bank policies but also from social policies introduced by the Lula government. Rising minimum wages and conditional cash transfer programs such as Bolsa Familia have turned a new and poor segment of the population into bank customers (for a short summary see Costa et al. 2015). This shows the complex process by which a transnationally bounded context of restructuring becomes embedded into national and regional social processes.

Territorial Proximity and Regional Shifts

The dynamic and continuous spatial reconfiguration—not only on a transnational but also on a national and regional level—can be considered a central characteristic of global production networks (and particularly of the global call centre industry), with labour costs being one of the main drivers for the relocation of production sites. Accordingly, also in the Brazilian case, such relocation is increasingly evident. This spatial reconfiguration does not evolve independently from central customers like banks. My research (interviews in 2012) reveals that 74 per cent of Brazilian call centres are located in south-eastern Brazil, mainly in São Paulo and Rio de Janeiro, the most important and largest economic centres in the country. This also holds for the financial sector, which is concentrated in this region, mainly in São Paulo, and the reason why most call centres were initially located here, with a second but much smaller agglomeration in the south. This demonstrates the continuing relevance of local proximity, although in the last few years a conspicuous regional shift which includes two different directions can be noted. Firstly, a shift from the centre to the periphery of São Paulo—a shift to where the workers themselves live, allows the construction of large-scale call centres at lower costs than in the city centre of São Paulo, but without losing the advantage of an already trained (although highly flexible) workforce and without losing physical proximity to the main customers. Secondly, another dynamics of relocation towards north-eastern Brazil has become apparent. In 2009 the north-eastern region overtook the south as the second most important location for the call centre industry (Braga 2012: 188f.). Large new call centres have been built in Salvador da Bahia and

in Recife in the state Pernambuco and more recently in Aracajú/Sergipe, with Contax and Atento as leading players. This shift follows the economic divide between the poorer north-east and the richer south-east and thus exhibits all the well-known legitimation patterns for such a shift: wages in the north-east are even lower than in the south-east, there is an abundant labour supply, there is sufficient infrastructure and space in the urban agglomerations of Salvador and Recife, and there is less trade union organisation. Furthermore, the State plays an important role through the provision of fiscal incentives for investment in the north-east in order to improve the provision of formal employment to young people in poor neighbourhoods.

These findings confirm what Phil Taylor has pointed out succinctly: 'that call centre location represents not a single "spatial fix (Harvey, 2006)", but a series of unfolding "spatial fixes"' (Taylor 2015: 276). Likewise, he emphasises the prominent role of labour costs in location decisions, together with other factors such as the availability of skills and competencies, as well as the availability of infrastructure, government regional policy, reputation and customer feedback (ibid.: 275). However, considering the significance of labour and labour costs, another central point should be integrated: the mentioned availability of skills and competencies of labour supply (as a precondition for relocation, such as towards north-eastern Brazil) is based on the commodification and modularisation of services which allow for deskilling. This, in turn, impacts on the specific form of the labour process which shapes social power relations and precarisation, as changes in the social profile and processes of qualification/deskilling are directly linked to it.

The (Neo-Taylorist) Labour Process and Social Segmentation

Service work can be distinguished from material production processes through the specific nature of its product. The commodity 'financial service' can be described as immaterial, insecure, ephemeral and risky—rendering it quite different from a material product, which can be planned and controlled by other means. As already noted, the diversification of

banking services is a central feature of the restructuring in the financial sector and an important strategy for maintaining and increasing profits in the context of heightened competition. Diversified and complex packages of financial services are not only at the centre of strategies for increasing productivity and customer retention, but also change work organisation, forms of rationalisation and modes of control. The intangible nature of service work implies serious contradictions concerning the managerial problem of control, because the subjectivity of workers plays a significant role in the provision of services. Thus, there is a strong link between the dependency on the subjectivity of workers for the provision of immaterial and relational services and the emergence of neo-Taylorist modes of organisation of service work (Tertre 2011: 65–67), including authoritarian modes of control. In call centres, these strategies become most visible, as this is the space where new forms of service relations are most institutionalised and subject to an informatics-based strategy of rationalisation, in order to achieve a maximum cost reduction. Still, there is some difference between internal bank call centres—which still exist on a small scale—and outsourced call centres.

Neo-Taylorist Work Organisation and Control of Immaterial Service Work

Brazilian call centres conform to a physical layout which is very similar for call centres all over the world (Holman et al. 2007). Centred on IT systems (Computer-Telephony-Integration), the individual work station for each telephone operator is equipped with a headset and a telephone switch for handling inbound and outbound calls and a computer which allows customer data to be accessed and changed. The frequency of calls processed is determined by the IT system and cannot be influenced by the workers. During the call, operators generally have to follow a preset script, which limits their individual autonomy in the conversation and reflects the high level of standardisation, also with regard to time: there are fixed target lengths which, depending on the task and product, can vary from 30–60 seconds to several minutes. Such standardised requirements for behaviour and performance are characteristic features of a Taylorist

work organisation (cf. Taylor and Bain 1999). Taylorist features are also evident in the fact that most operators are trained only for a specific product (i.e. credit cards or loans/credits); the work is divided into small steps and operators have no knowledge of the integral sequence of operation. Accordingly, there is little training, particularly in outsourced call centres. As a consequence, and despite the fact that such services are so vital for increasing bank profits, call centres as a new organisational form enable the replacement of highly educated and qualified personnel with a young, low-skilled work force.

Thus far, this work organisation shows typical characteristics of what has been determined Taylorism—although call centre work is immaterial work, it exhibits similar features to assembly line production in a factory. This has also been discussed as the industrialisation of the service industries. However, there are two different features which go beyond a Taylorist labour process. The first is the setting of performance targets: call centre agents are all obliged to sell products, a phenomenon known as cross-selling. The target could be, for example, to sell 60 life insurance policies per month, with variable remuneration dependent on whether or not these targets are met (own interviews April 2012). And this requires a second feature: the exploration of subjectivity. A person's voice—a very personal self-expression—itself becomes a means of production. There is high demand for patience, a good relationship with customers (even when these are annoyed, impolite, complaining and ranting), empathy, politeness, persuasiveness and—integral to these competencies—good salesmanship. It is this combination of Taylorist elements with a performance regime based on subjectivity that I call a neo-Taylorist service regime.

Tertre (2011) uses the term neo-Taylorism in a similar way and identifies neo-Taylorist rationalisation strategies as one possible response to the insecurity related to the measurement of productivity of immaterial services. He understands neo-Taylorism as a rejection and negation of the specificity of the service relationship, which includes the human, subjective factor. Neo-Taylorist strategies tend to reduce indications of efficiency to measurable parameters, such as the number of customers assisted, products sold or documents processed. He speaks of the perverse effects of neo-Taylorist reorganisation in relation to the quality of service as well as the recognition of employees and their position in the labour process (ibid.). And indeed,

the way in which service relations are organised in outsourced call centres cannot but compromise the quality of services—a phenomenon quite familiar to anyone who has dealt with a call centre. Banks apparently walk a fine line between maximising their cost reduction strategies on the one hand and jeopardising their market share and customer loyalty (due to poor service) on the other. How do they manage this risk? One answer lies within the specific division of labour between the bank's remaining internal call centres and the outsourced call centres (of the telemarketing sector), a division which reflects a corresponding segmentation of customers. In principle, the outsourced workers offer every category of bank services, but not for every category of customer. Although labour division between internal and external call centres seems to be flexible and dependent on different recruitment strategies, most banks concentrate services for private and corporate customers with a certain level of economic power in special internal departments. Agents in internal call centres enjoy a more comprehensive initial training programme compared to those in outsourced call centres. This indicates the higher level of qualification, and quality, not only of agents but also of the services provided—one of the main distinctions between bank internal and outsourced call centres.

Whereas the impact of changing service relations on the segmentation of customers clearly demonstrates that the consumption side should be considered in service chain analysis, at the same time these changes are most strongly reflected in the sharp segmentation and recomposition of the work force in call centres, as evident in the comparison of bank internal call centre workers and outsourced telemarketing workers.

Social Relations in Call Centres—Worker Profiles and Intersecting Inequalities

Call centres form a new 'low wage segment' within banks, located at the bottom of the hierarchy in terms of reputation and pay. This reflects a trend towards social downgrading in the banking sector, as banks were long seen as 'a sectoral island of modernity in Brazilian society' (Segnini 1998: 20), not only because of their economic weight, but also for their highly developed technological diffusion and the extraordinarily high level of education of their workers (ibid.). Of these, 85 per cent possess

an academic background (Departamento Intersindical de Estatística e Estudos Socioeconômicos (DIEESE) 2012); with few exceptions, this has become a precondition for recruitment. Furthermore the workforce is characterised by a long-standing tradition of trade union organisation. Relatively high salaries and benefits and a series of rights and standards reveal the bargaining power of the trade unions and the comparatively privileged situation of bank workers, which also marks their social position: bank workers belong to the social middle class and two thirds are between 25 and 44 years old (Federação Brasileira de Bancos (FEBRABAN) 2008). Almost half of the workers are women and 81 per cent are white, but only 11 per cent are black men, with black women accounting for a meagre seven per cent[6] (FEBRABAN 2010: 31).

Workers in the internal call centres of banks differ from this general profile of bank employees, with a higher proportion of women at 71.6 per cent[7] (DIEESE 2012). This shows the persistence of a traditional sexual division of labour, as women have traditionally worked as telephone operators. Whereas, on the one hand, women have succeeded in increasingly occupying leading positions as supervisors, operations managers and department directors (Jinkings 2002: 194, 195), call centres on the other hand mark a rupture in the supposed linear upward movement of women in the bank hierarchy and, instead, reveal an increasing polarisation between different groups of women and thus a complex process of gendered segmentation of the workforce.

The Profile of Outsourced Call Centre Agents

The profile of telemarketing workers differs fundamentally from that of bank workers in general. Outsourced call centre agents are much younger, between 18 and 25 years old, and 84 per cent are female (ABRAREC 2012). Most of them live in poor neighbourhoods on the outskirts of São Paulo, indicating that they belong to a lower social class

[6] With the term black I refer to the classification of race (negro) used by IBGE (Instituto Brasileiro de Geografia e Estatística). It distinguishes four categories: white, Negro, indigenous and yellow. 'negro' summarises all people who in the official census declared themselves as black or dark-skinned (pardo).

[7] In relation to the percentage of black workers in internal call centres, unfortunately there is no disaggregated data on race available, at least none that has been published.

and—linked to this fact—are more likely to be dark-skinned[8]. Race has always been a decisive factor in the structuring of social and economic inequalities in Brazil; correspondingly, more telemarketing workers are dark-skinned than bank workers.[9] This is directly related to the still prevailing invisibilisation, stigmatisation and social exclusion of dark-skinned and black people in Brazil.[10]

Whereas an academic qualification is a prerequisite for employment in banks, only the completion of secondary school is required for telemarketing workers. Nonetheless, most of them are university students and for many of them it is their first job—at least within the formal labour market—which is important, as this guarantees certain rights according to the labour law. Thus, due to the extremely high demand for telemarketing operators in recent years, a particular social group has been integrated into the formal labour market whose employment opportunities had previously been limited chiefly to the informal sector. Notwithstanding that, employment in call centres is precarious work. Even though call centres within banks also form a new segment of low-qualified employees, their workforce can count on much more symbolic, economic, social and cultural capital than outsourced workers. Their inclusion in a highly regulated sector not only provides more prestige but also a different material base. Outsourced call centre operators receive a minimum wage (R$ 622 in 2012, plus possible commissions for sales), whereas internal call centre operators receive the basic wage of the banking sector (approx. R$ 1400) as well as additional benefits fixed through collective agreements (cf. Sanches 2006: 80–81). On the whole, poor working conditions, low wages, the perception of the work as occasional, the bad reputation and the lack of career opportunities explain extremely high turnover rates—a striking characteristic of telemarketing. Nevertheless, many keep working in call centres because there are no better employment opportunities. This is particularly true for the new masses of call centre workers in the

[8] Similar social profiles of call centre workers can be identified in other locations in Brazil.

[9] Again, there is no systematic survey of race/skin colour available in relation to the racial segmentation of the labour market for the telemarketing sector.

[10] I refer to skin colour, as this is the base for the official census and the linking factor for the generation of stereotype classifications based on phenotypes (cf. Bento 2008).

economically underdeveloped north-eastern regions where the minimum wage is even lower.

Images, Identities and Persisting Inequalities

To understand the production and reproduction of inequalities related to gender, class and race in the banking/telemarketing sector we have to go beyond the analysis outlined thus far. We also have to take into account the (self-) classifications of telemarketing operators, which correspond to the noticeable depreciation also present in public discourses and comments (see also Braga 2007; Venco 2009; Souza 2012). Telemarketing operators have a very different image from bank workers not only because of factors such as education, social class, skin-colour, and age but also because of their physical appearance and presentation. This is an outcome of the fact that a call centre agent is not visible for the customer, a factor that impacts on recruitment strategies. Banks, for example, apply other criteria with regard to aesthetic stereotypes for contracting workers for a bank branch. It is an advantage to be white, pretty/handsome, well-dressed, and so on, which is to say that the applied criteria for recruitment tend toward hegemonic gender images and stereotypes (both for men and women). The image of telemarketing operators differs completely, a fact also expressed by the workers themselves in my interviews: They described and declared themselves as negroes, ugly, obese, homosexual, transvestites, people with tattoos, piercing, belonging to sub-cultures, disabled and so on. 'Everybody gets in here, without discrimination' was a generalised statement expressed in a conspicuously uniform way by different interviewees, whether workers themselves, managers, representatives from the employers' organisation or trade union activists. In this discourse, call centres appear as a space of unexpected equality and equal opportunity regardless of any membership in a (stigmatised) social group. Apparently, in such a publicly invisible environment, gender, class, age, race, sexual orientation and other factors do not matter, but rather individual behaviour. At the same time there is a kind of unifying factor applied to all agents: attributed inferiority. The majority of women is joined by a minority of men, who predominantly present characteristics

such as homosexual, transsexual, transvestite or black—attributes which are negatively classified in a society based on racism, sexism and heterosexual norms, and which generate difficulties for these groups of people to access other segments of the formal labour market (Venco 2009: 60). In a contradictory process between self-attribution and discrimination on the one hand and a limited inclusion as (second-class) citizens on the other hand, telemarketing operators construct a new type of working-class identity which is marked by the permanent promise of social ascendance.

Conclusion

My findings challenge simplified understandings of global production networks and highlight the complex reconfiguration processes of the landscape of the call centre industry. Brazilian call centres are not directly integrated into Global Production Networks through the outsourcing of customer services to Brazil. Rather, transnational capital applies global standards to the Brazilian financial sector to boost value creation on a global scale which in turn leads to modularisation, outsourcing and the emergence of call centres. Thus, the Brazilian case on the one hand reveals transnational entanglements and the isomorphic effects of global benchmarks in the wake of a financialised mode of capitalist accumulation. On the other hand, Brazil has become a regional centre itself, questioning Eurocentric perceptions of Global Value/Servicing Chains. Moreover, my findings show the complex interrelation between such processes and social segmentation. This becomes evident through an analysis of the labour process which clearly shows the role of technology (digital work) as an important driver of time-space compression in relation to the following different aspects. Firstly, digitalisation allows for spatial shifts on sub-national, regional and transnational levels. Secondly, it impacts on the specific form of the labour process and the related complex modes of subjectification. Call centre work represents new modes of control and domination. This is closely linked to processes of social segmentation of the workforce, which require a closer and intersectional analysis of the workers' profiles and identities and corresponding (old and new) lines

of inequalities (see also Sproll 2014). These evolve within specific social, political, economic and territorial spaces and thus integrate different layers of trans-/nationality, pointing to multiple spatial and also *social* fixes of global production.

Agency—although not explicitly discussed in this paper—points to such spatial and social fixes underlining the significance of local embeddedness. Neil Coe takes up this important point, which he terms the horizontal dimension of GPNs, referring to 'particular institutional and regulatory spaces, with particular histories and trajectories' (Coe 2015: 181). Negotiation processes in the Brazilian call centre industry provide an example of downgrading dynamics, for example in relation to the deregulation of legal rights (i.e. the current implementation of a further liberalisation of outsourcing), struggles for (re-)regulation of the new telemarketing sector, and the related controversies in connection with the further deskilling of call centre work versus the strengthening of the sector through qualification. Future prospects for trade unions and for organisation of the workforce in this highly precarised segment certainly deserves further research, especially with regard to the new profiles and identities of call centre workers, which reflect social changes and struggles as a whole.

References

ABRAREC (2012). *O Setor de Contact Center. Panorama Setorial, Perspectivas de Mercado e Principais Gargalos a serem Solucionados*. São Paulo: Apresentação Abrarec.

Bair, J. (2005). Global capitalism and commodity chains: Looking back, going forward. *Competition & Change, 9*(2), 153–180.

Bair, J. (2010). On difference and capital: Gender and the Globalization of production. *Signs, Journal of Women in Culture and Society, 36*(1), 203–226.

Bento, M. R. da Silva (2008) *Classificação racial*: *entre a ideologia e a técnica,* Dissertação de Mestrado (unpublished). São Paulo: PUC.

BM & F Bovespa (2009) Nível 2. Governança Corporativa. Retrieved May 22, 2015, from http://www.bmfbovespa.com.br/pt-br/a-bmfbovespa/download/Folder_Nivel2.pdf.

Boes, A., & Kämpf, T. (2011). *Global verteilte Kopfarbeit. Offshoring und der Wandel der Arbeitsbeziehungen*. Berlin: Edition Sigma.

Braga, R. (2007). Information work and the proletarian condition today: The perception of Brazilian call center operators. *Societies Without Borders, 2*, 27–48.

Braga, R. (2012). *A política do precariado. Do populismo à hegemonia lulista*. São Paulo: Boitempo.

Coe, N. (2015). Labour and global production networks: Mapping variegated landscapes of agency. In K. Newsome, P. Taylor, J. Bair, & A. Rainnie (Eds.), *Putting labour in its place. Labour process analysis and global value chains* (pp. 171–192). Basingstoke: Palgrave Macmillan.

Costa, S., Fritz, B. and Sproll, M. (2015, July 3) Dilma 2.0: From economic growth with distribution to stagnation and increasing inequalities? *LASA Forum*, Vol. XLVI.

DIEESE (2012). RAIS Mulheres. Apresentação 08 de março de 2012.

Dunaway, W. (2014). *Gendered commodity chains. Seeing women`s work and households in global production*. Stanford: University Press.

FEBRABAN (2008). Programa FEBRABAN de Valorização da Diversidade. Retrieved September 27, 2011, from http://www.ceert.org.br/images/Febraban_ok.pdf.

FEBRABAN (2010). Bancos diversos para um Brasil diverso. O pioneirismo do setor bancário brasileiro na valorização da diversidade no ambiente de trabalho, São Paulo.

Flecker, J., Haidinger, B., & Schönauer, A. (2013). Divide and serve: The labour process in service value chains and networks. *Competition and Change, 17*(1), 6–23.

Frenkel, S. J., Korczynski, M., Shire, K. A., & Tam, M. (1999). *On the front line. Organization of work in the information economy*. Ithaca, NY: Cornell University Press.

Gereffi, G., & Korzeniewicz, M. (Eds.) (1994). *Commodity chains and global capitalism*. London: Praeger.

Harvey, D. (1990). *The condition of postmodernity*. Oxford: Blackwell.

Henderson, J., Dicken, P., Hess, M., Coe, N., & Yeung, H. W.-C. (2002). Global Production Networks and the analysis of economic development. *Review of International Political Economy, 9*(*3*), 436–464.

Holman, D., Batt, R., & Holtgrewe, U. (2007). *The global call centre report: International perspectives on management and employment, report of the global call centre network*. Ithaca, NY: Cornell University Press.

Huws, U., & Dahlmann, S. (2009). Global restructuring of value chains and class issues. *Revue Interventions économiques, 39*(2009).

Jinkings, N. (2002). *Trabalho e resistência na 'fonte misteriosa'. Os bancários no mundo da eletrônica e do dinheiro*. Campinas: Editora da Unicamp.

Jinkings, N. (2004). As formas contemporâneas da exploração do trabalho nos bancos. In R. Antunes & M. A. Moraes Silva (Eds.), *O avesso ao trabalho (1)* (pp. 207–241). São Paulo: Expressão Popular.

Lüthje, B., Hürtgen, S., Pawlicki, P., & Sproll, M. (2013). *From Silicon Valley to Shenzhen. Global production and work in the IT industry*. Lanham: Rowman & Littlefield.

Newsome, K., Taylor, P., Bair, J., & Rainnie, A. (Eds.) (2015). *Putting labour in its place. Labour process analysis and global value chain*. Basingstoke: Palgrave Macmillan.

Ritzer, G., & Lair, C. D. (2009). The globalization of nothing and the outsourcing of service work. In M. Korczynski & C. L. Macdonald (Eds.), *Service work. Critical perspectives*. New York: Routledge.

Sanches, A. T. (2006). *Terceirização e Terceirizados no Setor Bancário: Relações de Emprego, Condições de Trabalho e Ação Sindical*. São Paulo: PUC. Dissertação de Mestrado (unpublished).

Segnini, L. (1998). *Mulheres no trabalho bancário: Difusão tecnológica, qualificação e relações de gênero*. São Paulo: Edusp.

Selwyn, B. (2012). Beyond firm-centrism: Re-integrating labour and capitalism into global commodity chain analysis. *Journal of Economic Geography, 2012*(12), 205–226.

Souza, J. (2012). *Os batalhadores brasileiros. Nova classe média ou nova classe trabalhadora?* Belo Horizonte: Editora UFMG.

Sproll, M. (2013): *Precarization, genderization and neotaylorist work. How global value chain restructuring affects banking sector workers in Brazil.* Working Paper Series, No. 44. desigualdades.net.

Sproll, M. (2014). Precarisation and new class formations. The case of call centres in the Brazilian banking sector: in M. Sproll, and I. Wehr (eds.), *Capitalist peripheries. Perspectives on precarisation from the global South and North. Austrian Journal for Development Studies, XXX*(4), Vienna: Mattersburgian Association for Development Issues at Austrian Universities. 111–132.

Taylor, P. (2010). The globalization of service work: Analysing the transnational call centre value chain. In P. Thompson & C. Smith (Eds.), *Working life: Renewing labour process analysis* (pp. 244–268). Basingstoke: Palgrave Macmillan.

Taylor, P., & Bain, P. (1999). An assembly line in the head: Work and employee relations in the call centre. *Industrial Relations Journal, 30*(2), 101–117.

Taylor, P., Newsome, K., & Rainnie, A. (2013). Editorial: 'Putting Labour in its Place': Global Value Chains and Labour Process Analysis. *Competition and Change, 17*(1), 1–5.

Taylor, P. (2015). Labour and the Changing Landscapes of the Call Centre. In K. Newsome, P. Taylor, J. Bair, & A. Rainnie (Eds.), *Putting Labour in its Place. Labour Process Analysis and Global Value Chains* (pp. 266–286). Basingstoke: Palgrave Macmillan.

Tertre, C. D. (2011). Bancos e produtividade: entre dinâmica industrial e dinâmica serviçal? In L. I. Sznelwar (Ed.), *Saúde dos bancários* (pp. 63–82). São Paulo: Publisher Brasil.

Venco, S. (2009). *As Engrenagens do Telemarketing. Vida e Trabalho na Contemporaneidade*. Campinas: Editora Arte Escrita.

7

Local Development Policies, the Labour Market and the Dynamics of Virtual Value Chains: the Case of the IT Sector in the Municipality of Londrina, Brazil

Simone Wolff

Introduction

The main aim of this chapter is to consider two aspects of public policy, local economic development and entrepreneurship, which have become issues in the labour market as a result of the implementation of neoliberal policies. The argument put forward here is that these policies have exacerbated, rather than reduced, the provision of flexible low wage employment within the value chains of transnational oligopolies in Brazil.

Notions of local development and entrepreneurship gained their relevance in literature in the 2000s when the deleterious effects of policies related to the liberalisation of foreign trade and investment on the labour market became more evident. These policies were implemented during the 1990s when Brazil opened up to flows of foreign capital, reduced trade protection and increased privatisation. These measures resulted in the restructuring of production, which led to an unprecedented increase in the rate of unemployment, in the industrial sector in particular (Neri et al. 2000).

Since then, two trends have been evident in the Brazilian labour market. Firstly, there has been a small reallocation of the workforce from production to the service sector, where there is less compliance with

J. Flecker (ed.), *Space, Place and Global Digital Work*, Dynamics of Virtual Work, DOI 10.1057/978-1-137-48087-3_7

labour laws and a higher rate of turnover (Cireno 2003). Secondly, there has been an increase in informal work, particularly from an increase in temporary employment and self-employment. There is a consensus that, taken together, these account for an increase in the precariousness of employment and working conditions associated with more flexible labour contracts and an absence of social security (Druck 2011; Mattoso 2000).

These trends can be explained, in part, by the increased mobility of large firms in the global economy. The strategy of transferring routine processes from large corporations to peripheral countries, whose workforce is cheaper and more pliable, was facilitated by the advent of information technologies (IT) that resulted in global sourcing (Dall'Acqua 2003: 83). This resulted in a new type of internationalisation of production that is characterised by the formation of virtual value chains in search of more competitive advantage in the global market. Despite the fact that this signals a new pattern of competitiveness, the underlying driver is still the conventional search for cheaper labour in countries with low rates of technological innovation.

The analysis of policies followed in relation to local economic development and entrepreneurship will be in the context of strategies that identify the way that localities can be supported in, and oriented towards, making and maintaining links with virtual chains of value in order to safeguard and secure their place in the global economy.

According to Pochmann (2012: 30), in terms of the intensification of formal work in Brazil, particularly after 2004, 95 per cent of employment pays a salary of up to 1.5 times the minimum wage;[1] however this is the case in only 48 per cent of the service sector. In order to address this issue, particularly in relation to informal work, policies for generating employment and revenues use an entrepreneurial approach implemented through projects at local rather than national level.

The empirical focus used to explore these issues is the Local Productive Arrangement of Information Technology in the city of Londrina in Paraná, Brazil. The aim was to define the profile companies and the labour market in the IT sector of this region in order to examine the extent to which this policy has been successful in generating new patterns

[1] Minimum wage in Brazil in 2014 is R$810,00, equivalent to £ 212.95.

of development. The data were collected from the site of the Ministry of Labour and Employment (RAIS/CAGED)[2] from March through June 2012. The criteria used for analysis were the number, size and type of activity of the companies, the formal employment relations, and the salaries for each type of activity, the level of education required and the age and turnover of employees.

The first part of the chapter examines the literature on global value chains and the institutional responses of the countries which rely on capturing a part of their activities. The second part of the chapter explores the implication of this for local development and entrepreneurship in the context of programmes for the generation of employment and revenues in Brazil. The third part of the chapter explores the impact of entrepreneurial and local economic development policies. Finally, the chapter draws some conclusions regarding the impact of these policies on the dynamics of work in the context of the current phase of capital internationalisation.

Global Value Chains and the Entrepreneurial Approach to Local Economic Development

Crises that result from a lack of opportunities for profitable investments require the constant creation of demand for capital goods and new productive resources that, in turn, demand the continuous opening up of new markets for the surplus capital of core economies (Harvey 2005a, b). This leads to the search for cheaper workforces, new markets for goods and the constant innovation of processes and products. These new movements of capitalist expansion find an echo in the development models of those countries that are brought into the circuit of capital.

Beyond cyclical commercial expansion aimed at extracting value from peripheral economies through the unequal exchange of raw materials with manufactured goods, the new phase of internationalisation is taking place by means of a 'decentralized centralization of the capital' (Sposito and Santos 2012: 36). Further, semi-peripheral countries take part in

[2] Labour Ministry (MTE): Annual Social Reports (RAIS); General, Record of employees active and dismissed (CAGED).

these dynamics through investment in their less central and less developed regions. This multipolar expansion is intensified and generalised on a global scale.

This is the result of two aspects of neoliberal macroeconomic policies. Firstly, financial globalisation, along with the expansion of foreign direct investment, started to influence national development policies. Secondly, transnational companies, increasingly using IT, have restructured their production by decentralising their operations and, in so doing, reduced their social obligations (Pochmann 2004).

The exchange and new division of labour between core and semi-peripheral countries and their less developed regions is between the production of advanced technology and high-value-added goods in the core versus the manufacturing and the production of low-value-added services in the semi-periphery. In the case of the latter, this represents supplying low-value-added services such as technical maintenance, operations and support for trade and after-sales support for high-value-added goods (Pochmann 2005, 2004). In contrast to the behaviour of multinational companies in the past, transnational companies can be better described as global networks that are geographically diffuse (Dall'Acqua 2003).

The virtualisation of value chains has been enabled by the computer-aided flow of information, which in turn enables and coordinates the connection between three subsets of the global process of valorisation: production chains, chains of suppliers, and logistics chains. The first two chains relate to so-called primary activities. Productive chains refer to those processes directly involved with the manufacturing and sales and after-sales of the end-product. The chain of supplies include the suppliers and distributors who, in an environment of production circulation, include the hierarchies of suppliers, direct clients, clients of the clients, and even competitors. The third chain represents the activities of support that are the logistics chain, which encompasses strategic planning and the acquisition of technology, as well as the management of personnel and processes. The logistics chain is the link between firms from the productive chain and the chain of supplies to complete the whole value chain (Dall'Acqua 2003). The companies that hold the intellectual property rights of the product and lie at the top of the value chain and coordinate the activities of other firms, in order to create value, are referred to as the dominant companies (Santos et al. 2010).

In an environment of transfrontier outsourcing there is an intersection of several chains of value as a result of the trend in dominant companies reducing their R&D activities in the home country or core economies and transferring them to the semi-periphery. The aggregation of value of the dominant company is therefore displaced and dispersed and links in value chains are expanded to other countries. The network created by the dominant company establishes a dynamic and complex 'system of values' that involves a downstream network of suppliers and an upstream network of distributors and clients (idem.). The virtual chains of value are, therefore, chains of value that go beyond the boundaries and territory of the dominant company as productive processes are fragmented and externalised. This creates a new structural hierarchy as the costs of low-value-added marginal activities (reproduction, standardisation, customisation, maintenance and trade) are reduced and higher aggregated value processes of research and development are at the top of the chain and more at a distance.

Besides the convenience of doing without capital for infrastructure and social obligations, this strategy is in alliance with the profit-making logic of the current phase of accumulation as it allows for additional gains by means of the 'revenue from know-how' whose profit is taken from the payment for the access and functionalities of the goods and not (only) from the sale (Cavalcante 2014). The software sector is an exemplar for the usury of value for, once it is created, the time required for its reproduction is minimal and the profit is assured by copyrights and royalties (idem.).

Therefore these new patterns of internationalisation require the creation of localities with adequate infrastructure to receive the surplus capital from the core. These localities, in turn, demand a variety of public utility services to develop themselves: industrial parks, sanitation, lighting, telecommunication, transport, warehousing, and schools (education and qualifications). With the liberalisation of capital flows, state intervention and support is increasingly required for funding such investments and, consequently, direct negotiations between local private and public power holders and transnational financial capital takes place (Harvey 2006).

In this context 'fiscal war' has become a major factor in local advantage as regions compete with one another (Caiado et al. 2004: 70). Regulations related to labour become a source of local competition. A labour force without trade union collective agreements, which blurs the frontiers between formal and informal work, is more attractive. This appears in the discourse on urban

and individual entrepreneurship Ministério do Desenvolvimento, Indústria e Comércio (MDIC). In English it would be Ministry of Development, Industry and Trade. 2012). Competition to provide the most financially advantageous package to attract external investments makes the labour market vulnerable to the global casino.

As a consequence, there is a tendency towards receiving activities that are low –value-added, and mainly in the service sector, and that represent the end link of transnational value chains (Baltar and Wolff 2009). By the late 1990s, Foreign Direct Investment (FDI) for manufacturing in Brazil accounted for 13.3 per cent, whereas the sector of services presented an index of The correct is Foreign Direct Investment (FDI) 83.7 per cent (Caiado et al. 2004).

It is within this framework that decisions on policies for local development took place as an alternative to the decrease of formal employment (Tapia 2005). The emphasis was on facilitating a structure of governance responsible for the coordination of a network of companies that would appeal to larger investments (Dall'Acqua 2003: 94). This stems from a belief that the flows of such networks can generate innovation and bring development to their regions (Costa Odorico de MoraesEloy da 2011).

Currently, the so-called local productive arrangements are seen as the main strategy for local development in as much as they stimulate micro, small and medium size companies to work as clusters and as such to provide for production in a given region. According to the prevailing perspective, these arrangements promote sustainable development because their location can be the articulation agency between the social and the economic (Antero 2006).

Through examining a case study the next section explores how far this strategy has been successful.

Chains of Precarisation: the Case of Local Productive Arrangements (LPAs) for IT in Londrina

The conception of local development aims at promoting entrepreneurial activity by attempting to shift from development based on comparative advantages due to an abundance of natural and human resources,

towards a stage of competitive advantage that is based on innovation (Sarfati 2013). However, more protection and intervention is required on the part of the national or local state to support competitive advantage (Dall'Acqua 2003). In particular, competitive advantage depends on initiatives from the local state in attracting new investment through public incentives and public and private partnerships (idem.). LPAs could promote this innovative environment by clustering companies in the same sector, mainly those of small size, and tapping into the economic, political, social and cultural aspects of a particular region (Tapia 2005).

Nevertheless, local characteristics have become more and more subsumed to the foreign direct investment (FDI) and to the technological pattern posed by the value chains of transnational corporations. This affects those municipalities that have no industrial tradition, and particularly those whose economic history is based on the agricultural activities that suffered with the commercial opening to agribusiness (Pochmann 2004). With little industry and the decline of the agrarian economy, urban entrepreneurship is seductive as a way of reconnecting local economies to the global economy. In this context the idea of a 'city of the future' emerges, which is devoted to the 'activities of control and command, an informational city, post-industrial, in which the export of services (financial, informational, knowledge) is the economic basis for urban survival' (Pochmann 2004: 177). The term 'technopolis' has been used to illustrate cities that opted for this type of strategy (Araki 2000).

This is the case for the municipality of Londrina, the third largest city in southern Brazil with 543,000 inhabitants, that was founded 80 years ago.

The economic golden age of coffee in Londrina spanned the decades of 1940 to 1960 (Londrina Prefeitura Municipal 2012). In the 1970s, coffee production underwent a crisis and therefore so did the economy of the city. Since then, the governments and the municipal business elites have been trying to forge a new economic 'place' for the city as a way of appealing to potential external investors in order to develop the economy.

With the convenience of not requiring investments for large industrial plants and Lodrina's proximity to the south-east, the most industrialised region of Brazil, the IT sector was considered strategic for the economic development of the city. In 1999, the project Londrina Tecnópolis (Associação do DesenvolvimentoTecnológico de Londrina e Região

(ADETEC) 2012) was launched. The preponderance of small businesses in the sector led to the creation of the Local Productive Arrangement Local Productive Arrangement (LPA) for Information Technology in 2006 (Arranjo Produtivo Local 2011). The words of Mayor Alexandre Kireeff reaffirm the project:

> Due to the kind of logistics required, we do not have competitive advantages for large automakers, large companies from outside. We are away from the sea coast. We have so many tolls to pay that we feel like being on an island surrounded by high customs barriers; so we must favour small and medium size companies. Also, we have to favour the companies that do not make use of the traditional ways for production and exportation, those that do not use land or railroads but the information highways. This is the reason Londrina is attractive to IT companies today. (AssociaçãoComercial e Industrial de Londrina (Paraná State, Brazil) (ACIL) 2013)

In this way what had been considered a hindrance to the development of the city, that is, its proximity to the most industrialised regions of the country, was hailed as a 'competitive advantage'. The information highways allowed the employment of a workforce that is cheaper in comparison with that of large industrial centres where the success of organised labour had led to comparatively higher salaries.

Currently, the LPA for IT in Londrina and its surroundings comprises 110 companies of micro, small, and medium sizes. Their activities include: consulting in hardware, software development, data processing, databank activities and online distribution of electronic contents, and maintenance and repair of computer equipment. These segments are subdivided into over other 65 sub-sectors (Arranjo Produtivo Local 2012) whose activities represent the end links of IT value chains organised and controlled by the dominant companies. These companies hold the intellectual property and consequently the monopoly of access to innovations, and the power to alter the patterns of capital goods and consumption markets (Hirata and Zarifian 1991). Through the relationship with suppliers, incremental innovations take place as a result of daily efforts for the improvement of existing products and processes in search of better quality and productivity (Fleury 1993: 35). In the case of software, incremental innovations relate to those activities that involve adaptation to the specific local market.

A value chain approach, distinguished by the division of work between these companies, forms a clear hierarchy in terms of the dependence of local companies on the dominant companies that hold the intellectual property rights. Thus, the process of valorisation starts in the dominant company and ends with the local ones (Castillo 2008); the more distant the head company the lower the value and the cheaper the work.

The virtual value chain of a dominant IT company takes place through the flow of information parallel to the physical chains (productive, of supplies and logistics), represented by the 'hand companies' that aggregate value and provide for competitive advantage through differentiation and reduced costs. Thus, value is derived from each stage of these chains with distinct advantages and capacities. As a result of internationalisation, suppliers, suppliers of suppliers, distributors, partners, sub-contractors, and social and political institutions from each country become links of valorisation at the same time as the legislation, training, fiscal and logistic incentives run parallel in the generation of competitive advantage (Fig. 7.1).

These innovations are mediated by local research institutions that provide the qualified personnel for the companies in the chains of supplies and by the hardware companies that provide the equipment for the software (Fig. 7.2).

In another stage, the medium and large size companies acquire permits for the use of software from the dominant company, but still keep their own IT departments for customisation. The dominant company

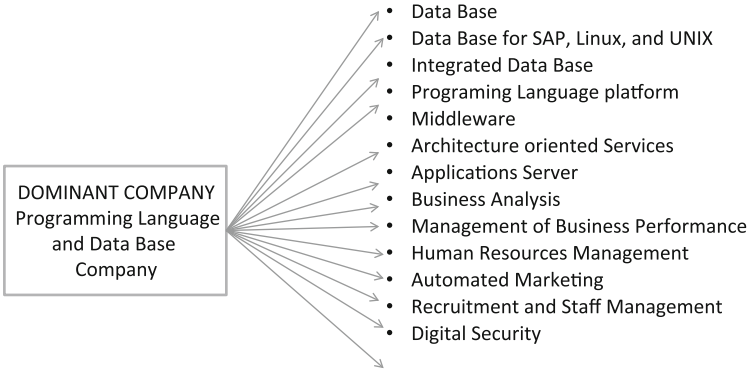

Fig. 7.1 Dominant company of software development

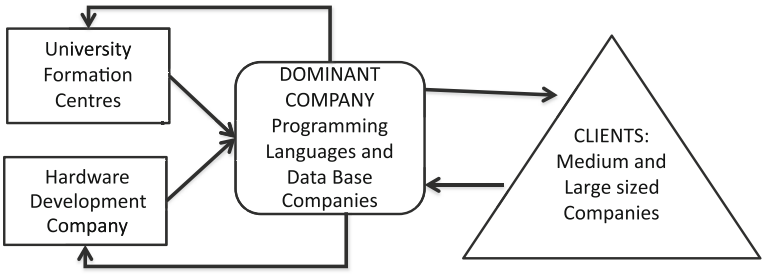

Fig. 7.2 TI value chain

retains its nexus of valorisation with the others by the provision of technical support and partnerships for the development of new products and expansion of clients. The client companies, on the other hand, become suppliers when they outsource part of the production process of software to other local companies in order to meet the demand of end clients. At all stages, there is an exchange of information as a type of commodity that adds value to the product.

In this perspective, therefore, the reason for the existence of productive chains, chains of supplies and logistics in the IT sector is the dominant company. That is, the intermediary links (suppliers, developers, distributors and assistance and maintenance services), 'in terms of property, are small local companies but, due to their capacity of technological integration and administrative centralization, they are large transnational companies' (Bernardo 2004: 118). This is how the virtualisation of the value chains produces a complex diversity of new forms of labour that equate the means of extraction of relative and absolute added-value to that of the putting-out-system found in the beginning of capitalism (Bernardo 2004).

There is much academic literature that points to the way in which these processes demand reduced labour costs and more precarious contracts (Druck 2011, Marcelino 2008, Krein 2007). This contributes to explaining the current tendency to deregulate the labour market by flexibility of contracts, which in turn leads to informality and unemployment. The introduction of new models of management that promote outsourcing (Krein 2007) have led to a drastic increase in small and micro companies (Krein 2012).

Results and Outcomes of Entrepreneurial Initiatives in Londrina

This section examines the results and outcomes of the initiatives in Londrina according to three themes: linkages, employment and wages, and the education, age and turnover of employees.

Linkages

Since the implementation of the LPA for IT in Londrina, there have been a considerably increased number of micro-companies in this sector with no employment regulation (Fig. 7.3).

Most of these companies, 63.4 per cent (Fig. 7.4), undertake activities that fit in the fringes of the IT value chains, that is: data processing and organisation, consulting in software, online distribution of electronic items, and other computer activities. Therefore, they are companies whose workforce, 93.78 per cent, is the cheapest within the IT value chain, with an average monthly wage ranging from 0.51 to one times the minimum wage.

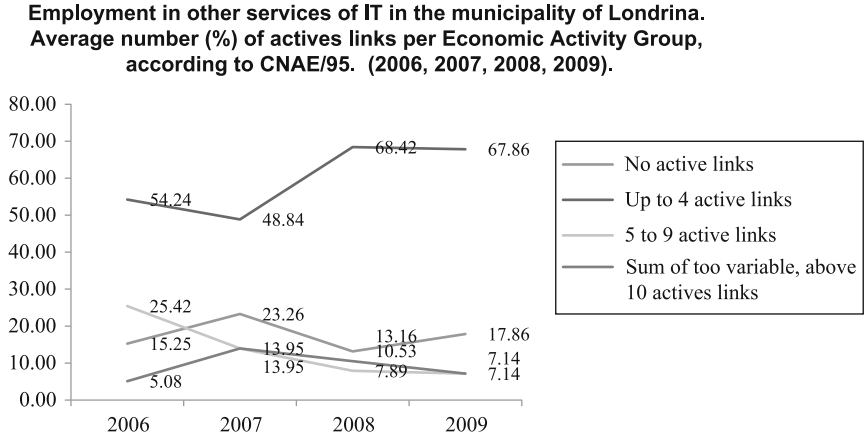

Fig. 7.3 Employment in IT services companies in the municipality of Londrina (April 2012)

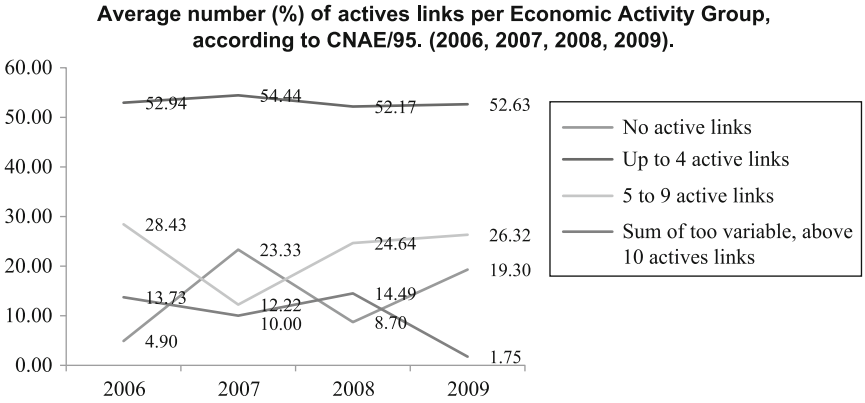

Fig. 7.4 Employment in companies for data services, internet hosting and activities alike in the municipality of Londrina (April 2012)

Employment and Wages

The category with highest wage is that of consulting, with an average of two to three times the minimum salary. Nonetheless, as shown in Figs. 7.5, 7.6 and 7.7, this is one of the activities with fewest employees and only 6.98 per cent of formal work.

In Fig. 7.8, the set of the workforce with a salary that ranges from two to three times the minimum wage, in the sector of consulting in software and hardware has a higher educational level. Most remaining individuals in the workforce have only completed secondary education.

Education, Age and Turnover of Employees

These data along with those related to the predominant age range of 18 through 24 in all the segments (Table 7.1) evidence little demand for labour experience and the low level of technical qualification and consequent low wages (Fig. 7.9).

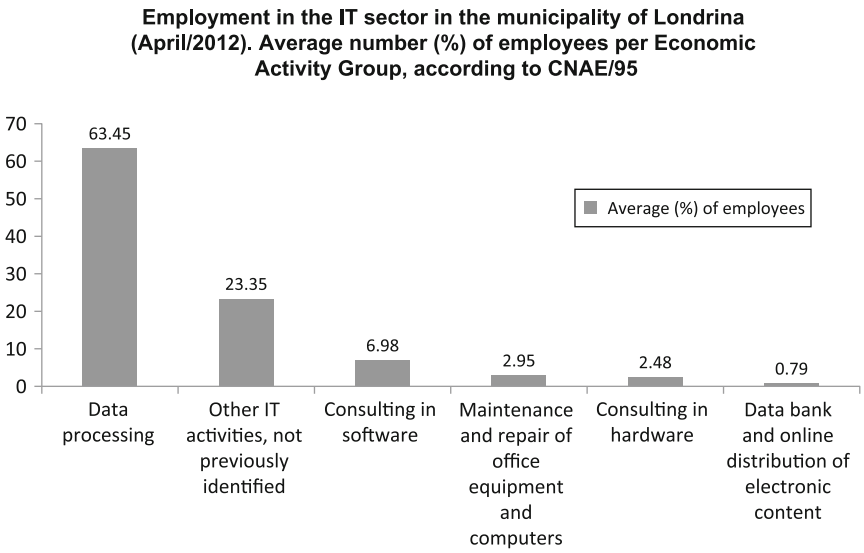

Fig. 7.5 Employment in the IT sector in the municipality of Londrina (April 2012)

Another variable that shows in a more qualitative way the precarisation of the work in the IT sector in Londrina is the high turnover of the workforce. Studies have shown that this is directly related to the seasonal nature of some sectors, such as the sector of clothing (Silva 2009, Jinkings and Amorim 2006), as well as to working conditions of routine and little creative work that do not require high qualifications (Antunes and Braga 2009). According to CAGED—the General Register of Employed and Unemployed Individuals (Table 7.2), there is a high level of turnover in the IT sector of Londrina.

The turnover that takes place in technologically advanced sectors is due mostly to the logic of the copyrights system that, in order to keep the clientele, promotes recurrent updating for a more 'friendly' use. Consequently, there is a simplification in the intermediary processes and a dependence on and vulnerability to qualifications supplied by the owners of the patents. As the simplification of the systems also leads to the simplification of the required skills, the time for qualification is reduced and hiring or dismissal of employees takes place only upon contingent demands.

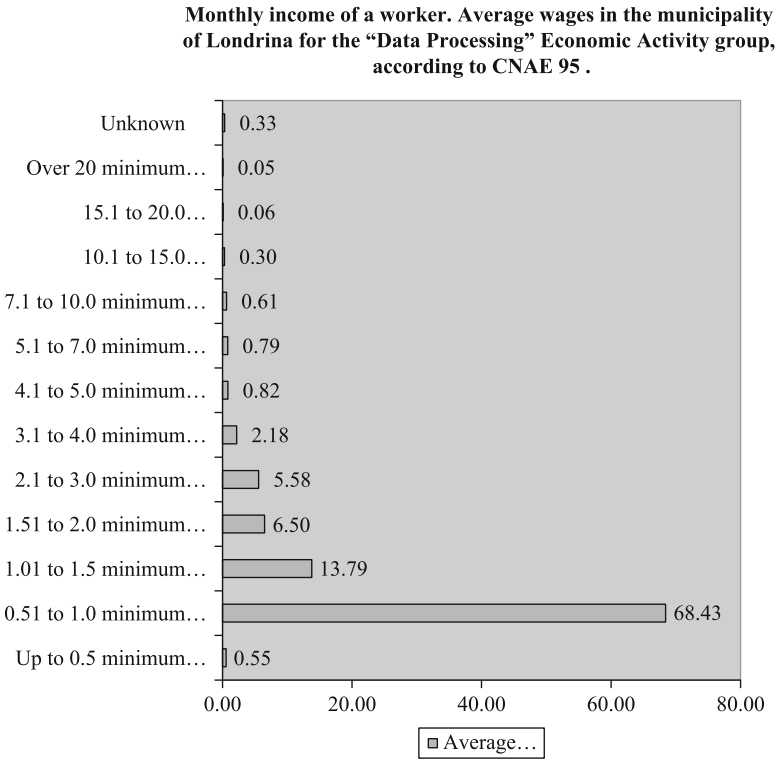

Fig. 7.6 Monthly income of a worker. Average wages in the municipality of Londrina for the 'Data Processing' economic activity group, according to CNAE 95 (June 2014)

In the context of more demanding work, this issue relates to temporary employment specific to projects commissioned by companies which, in turn, serve large corporations. Due to dependence of the companies from the end of the value chains, in regard to demands by clients of the intermediary links, the contracts under no limited time do not appeal. Therefore, it is in these processes that doors are open for moreflexible labour contracts, such as the self-employed and the individual micro-entrepreneurs[3] (Ferreira 2014, Castro 2013).

[3] Individual Micro-Entrepreneur—MEI is a public policy of the Brazilian government in reference to the 'individual who works independently and is registered as the owner of a small company. (…)

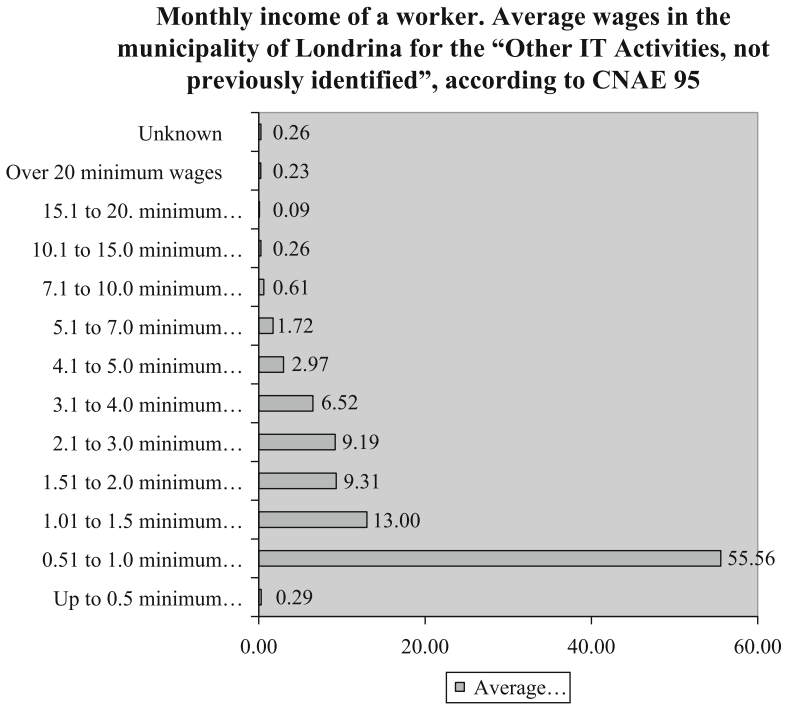

Fig. 7.7 Monthly income of a worker. Average wages in the municipality of Londrina for the 'Other IT Activities, not previously identified', according to CNAE 95 (June 2014)

That way, this scenario presents the same dynamics of labour exploitation found in less technology-intensive processes, with an absolute value-added space, and in the high technological density sectors, with relative value-added space. Thus, the employment of workforce connected to the value chains by the IT transnational companies becomes exposed to labour instability in activities of low-added-value.

This individual may also have a hired employee who will be paid a minimum wage or the salary set by the respective labour union' (Portal do MEI, 2014).

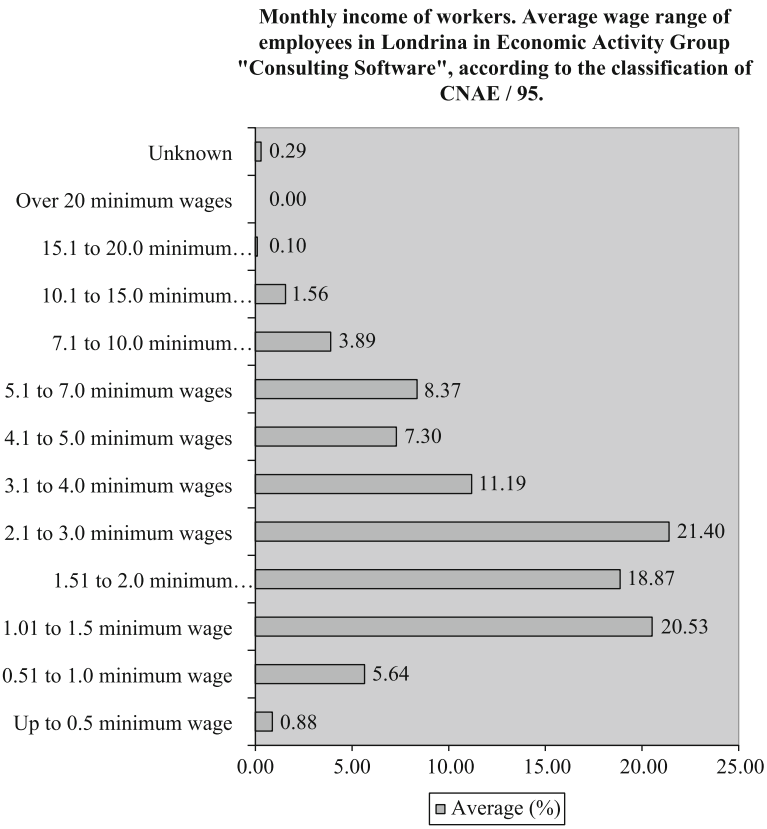

Fig. 7.8 Monthly income of the employee. Average wage range of employees in Londrina in economic activity group 'Consulting Software', according to the classification of CNAE 95

Conclusion

Despite the risk of undue generalisation and the need for comparison with other national and international experiences, this study allows for the formulation of some preliminary conclusions in assessing the success or otherwise of public policies based on local development and entrepreneurship aimed at generating employment and revenues.

Table 7.1 Age range of workers from IT sector in the municipality of Londrina, according to CNAE 95 (CAGED/MTE) June 2012

Economic activity group CNAE 95	Up to 17 years old	18 to 24	25 to 29	30 to 39	40 to 49	50 to 64	65 or older	Unknown	Total
Hardware consulting	2.74%	40.27%	29.04%	17.81%	6.03%	3.56%	0.00%	0.55%	100.00%
Software consulting	3.40%	44.26%	26.65%	17.61%	6.42%	1.36%	0.00%	0.29%	100.00%
Data processing	9.89%	56.60%	15.16%	12.53%	4.55%	1.20%	0.01%	0.05%	100.00%
Database activities and online distribution of electronic content	2.59%	43.10%	28.45%	16.38%	6.90%	2.59%	0.00%	0.00%	100.00%
Maintenance and repairing of office machines and computers	4.61%	54.15%	21.66%	15.44%	2.30%	1.84%	0.00%	0.00%	100.00%
Other IT activities, not previously identified	9.16%	57.85%	15.62%	11.95%	4.13%	1.16%	0.06%	0.06%	100.00%
Total	8.88%	55.45%	16.71%	13.00%	4.57%	1.29%	0.02%	0.08%	100.00%

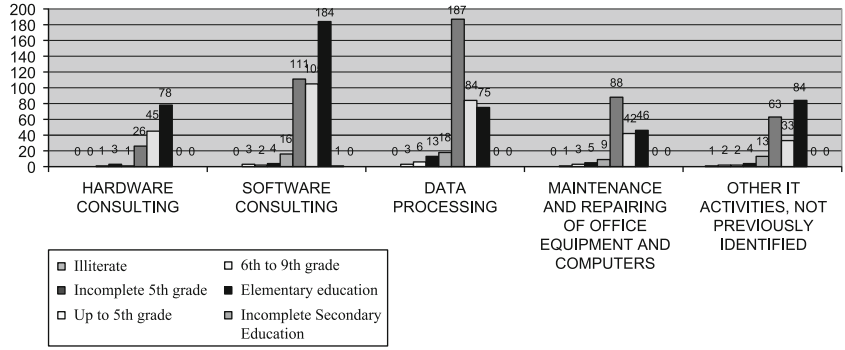

Fig. 7.9 Educational level of workers from the IT sector in the Municipality of Londrina, according to CNAE 95 (CAGED/MTE) June 2012

Table 7.2 Average (%) of hired and dismissed employees from the IT sector in the Municipality of Londrina, according to CNAE 95 (CAGED/MTE) June 2012

Economic activity group according to CNAE 95 (223 categories)	Hired	Dismissed	Total
Hardware consulting	56.14%	43.86%	100.00%
Software consulting	50.17%	49.83%	100.00%
Data processing	55.58%	44.42%	100.00%
Database activities and online distribution of electronic content	61.54%	38.46%	100.00%
Maintenance and repairing of office machinery and computer	50.00%	50.00%	100.00%
Other computer-related activities not previously specified.	56.04%	43.96%	100.00%
Total	54.91%	45.09%	100.00%

It is a fact that in the last decade these policies became relevant as a way to resolve local economic vulnerabilities in the face of transnational capital and the tendency to weaken local labour markets. However, this option is hindered by the strategies of large transnational corporations that, as they externalise the 'fringes' of their value chains into the national markets, force a focus on activities of logistics and of support to processes, products and trade. Therefore, as an effect of weakened labour conditions the traditional locus of cheap work in the service sector is amplified.

The analysis of the LPA for IT in Londrina enabled the identification of an increased number of micro-companies, many of the personnel with no formal employment records, and most of them involved with the customisation of IT products acquired from transnational companies. The predominant workforce is composed of young individuals, with secondary degree education and a range salary of 0.5 to one of minimum wages and the high rate of employment turnover implies indicators of precarisation already identified in the literature (Druck 2011). Entrepreneurs tend to host the simplest processes in the value chains of those corporations that own the copyrights of systems. In fact, these activities are more likely to make labour vulnerable to the mobility of capital in the context of economic globalisation.

This scenario reveals that policies for development and the generation of revenues are increasingly restricted to the strategy of making urban spaces and their labour markets attractive to capital through the provision of cheap labour by tax exemption. Therefore, there is a tendency to favour the centres of value chains of large transnational companies, now virtually expanded, to the detriment of the quality of local work further down the chain. By doing so, instead of strengthening local sustainable development, there is dependence on foreign private companies, holders of technological patents, and national development becomes subordinate to the large transnational capital.

This occurs because the current vertical disintegration of the value chains in their global-local articulation not only requires an internal restructuring of production and labour relationships, but also a remodelling of the social, economic and institutional bases to support this connection. Better policies to meet the new pattern of capital competition and accumulation are required, rather than those that place the burden on workers who are forcibly specialised and externalised from the valorisation nexus.

Also, the decentralised centralisation of the current movement of capital internationalisation (Sposito and Santos 2012: 36) has new contradictions as it integrates and increments new markets and triggers competitiveness between countries and, at the same time, eventually saturates the internal markets of labour and consumption. Therefore, new capital and workforce surplus is created and new crises of over-accumulations are likely to occur, as was the case in the countries of advanced industrialisation.

It is important to highlight that the sector rearrangements within the restructuring and flexibility of production, caused by the capitalist expansion, did not produce dynamic sustainable development but represented a new subordination of local economies to the strong transnational capital. Thus, we find an unequal development between the centre and the periphery in a multipolar and connected way. In sum, the result is contrary to that expected and announced by the discourse and actions related to public policies for entrepreneurship, whose main aim was to safeguard the local from the inclemency of the global capital.

References

Associação Comercial e Industrial de Londrina (2013). Kireeff quer mudar lei para atrair empresas (online). http://www.acil.com.br/noticias-detalhe/30/12/2013/Kireeff-alterar-marco-regulatorio

ADETEC – Associação do DesenvolvimentoTecnológico de Londrina e Região. 'Livro Londrina Tecnópolis', Online available at: http://adetec.org.br/site/?s=tecn%C3%B3polis&search=Buscar Accessed in Nov 2012.

Antero, S. A. (2006). Articulação de políticas públicas a partir dos fóruns de competitividade setoriais: a experiência recente da cadeia produtiva têxtil e de confecções. *Revista de Administração Pública, 1*(40), 57–80.

Antunes, R., & Braga, R. (2009). *Infoproletários: degradação real do trabalho virtual*. São Paulo: Boitempo.

Araki, K. (2000) Technological innovation, national urban policy and local development: Policy implications of the concept of technopole and Japan's Technopolis Programme for Developing Countries (online). http://www.bartlett.ucl.ac.uk/dpu/publications/latest/publications/dpu-working-papers/wp110.pdf

Baltar, R., & Wolff, S. (2009). *'Trabalho decente e cadeias produtivas: uma análise da implementação de programas estaduais para promoção da agenda trabalho decente no Brasil' in Anais do 14° Congresso Brasileiro de Sociologia*. Rio de Janeiro: Sociedade Brasileira de Sociologia.

Bernardo, J. (2004). *Democracia totalitária: teoria e prática da empresa soberana*. São Paulo: Cortez.

Caiado, S. C., Ribeiro, T. F. F. and Amorim, R. L. C. (2004) 'Políticas neoliberais e reestruturação produtiva'. In: Pochmann, M. (Org.): *Reestruturação produtiva*: *perspectivas de desenvolvimento local com inclusão social.* (Rio de Janeiro: Vozes), 63–146.

Castillo, J. J. (2008). Las fábricas de software en España. Organización y división del trabajo: el trabajo fluido em la sociedad de la información. *Política & Sociedade, 7*(3), 35–108.

Costa, Odorico de MoraesEloy da (2011) ARRANJOS PRODUTIVOS LOCAIS: APL´s comoEstratégia de Desenvolvimento: umaAbordagem-Teórica. Fortaleza, Instituto de Pesquisa e EstratégiaEconômicadoCeará. ISBN: 978-85-98664-21-7.

Castro, B. G. (2013) 'Afogados em contratos: o impacto da flexibilização do trabalho nas trajetórias dos profissionais de TI'. *Tese de doutorado*, *Instituto de Filosofia e Ciências Humanas*, *Universidade Estadual de Campinas*, Campinas, Brasil.

Cavalcante, S. (2014). Valor, renda e 'imaterialidade' no capitalismo contemporâneo. *Caderno Caderno CRH: Revista do Centro de Recursos Humanos da UFBA, 27*, 115–130 Online http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-49792014000100009.

Cireno, F. (2003) 'Mudanças estruturais no emprego brasileiro na década de 90'. *Anais do 27º Encontro Anual da ANPOCS.* Caxambú: ANPOCS (online). http://www.anpocs.org/portal/index.php?option=com_docman&task=doc_view&gid=4174&Itemid=316

Dall'Acqua, C. T. B. (2003). *Competitividade e participação: cadeias produtivas e a definição dos espaços econômicos, global e local*. São Paulo: Annablume.

Druck, G. (2011). Trabalho, precarização e resistências: novos e velhos desafios? *Caderno CRH: Revista do Centro de Recursos Humanos da UFBA, 24*(n.esp.1), 35–55.

Ferreira, L. A. S. (2014) 'Políticas públicas de desenvolvimento, emprego/renda e incentivos aos pequenos negócios no setor de tecnologia da informação: quais as consequências para o mercado de trabalho do município de Londrina?' *Trabalho de Conclusão de Curso*, *Centro de Letras e Ciências Humanas*, *Universidade Estadual de Londrina*, Londrina, Brasil.

Fleury, A. (1993) 'Novas tecnologias, capacitação tecnológica e processo de trabalho' in Hirata, H. (org.) *Sobre o modelo japonês*, 33–48. São Paulo: EDUSP.

Harvey, D. (2006). *A produção capitalista do espaço*. São Paulo: Annablume.

Harvey, D. (2005a). O 'novo' imperialismo: sobre rearranjos espaciotemporais e acumulação mediante despossessão. *Margem Esquerda: ensaios marxistas, 5*, 31–40.

Harvey, D. (2005b). *O novo imperialismo*. São Paulo: Loyola.

Hirata, H., & Zarifian, P. (1991). Força e fragilidade do modelo japonês. *Estudos Avançados, 5*(12), 173–185.

Jinkings, I. and Amorim, E. R. A. (2006). 'Produção e desregulamentação na indústria têxtil e de confecção' in Antunes, R. (org.): *Riqueza e miséria do trabalho no Brasil* (São Paulo: Boitempo), 337–385.

Krein, J. D. (2012) 'Condições e relações de trabalho no segmento das micro e pequenas empresas' in Santos, A. L., Krein, J. L. and Calixtre, A. B. (orgs.). *Micro e pequenas empresas*: *mercado de trabalho e implicação para o desenvolvimento* (Rio de Janeiro: IPEA).

Krein, J. D. (2007) '*Tendências recentes nas relações de emprego no Brasil:* 1990–2005. 2007'. *Tese de Doutorado em Economia Social e do Trabalho, Universidade Estadual de Campinas*, Campinas, Brasil.

Prefeitura Municipal, de Londrina (Br) (2012) *Arranjo produtivo local de TI de Londrina e Região* Online available at: http://www.apltilondrina.com.br/

Marcelino, P. R. P. (2008) 'Terceirização e ação sindical: a singularidade da reestruturação do capital no Brasil'. *Tese de Doutorado em Ciências Sociais*, *Universidade Estadual de Campinas*, Campinas, Brasil.

Mattoso, J. (2000). *O Brasil desempregado: como foram destruídos mais de 3 milhões de empregos nos anos 90*. São Paulo: Fundação Perseu Abramo.

Ministério do Desenvolvimento, Indústria e Comércio Exterior (BR) (2012). *Notícias* (online). http://www.mdic.gov.br/sitio/

Neri, M., Camargo, J., & Reis, M. C. (2000). *Mercado de trabalho nos anos 90: fatos estilizados e interpretações*. Rio de Janeiro: IPEA.

Pochmann, M. (2012). *Nova Classe Média? o trabalho na base da pirâmide social brasileira*. São Paulo: Boitempo.

Pochmann, M. (2005). *O emprego na globalização: a nova divisão internacional do trabalho e os caminhos que o Brasil escolheu*. São Paulo: Boitempo.

Pochmann, M. (2004) *Desenvolvimento capitalista e divisão do trabalho* in Pochmann, M. (org.): *Reestruturação produtiva*: *perspectivas de desenvolvimento local com inclusão social* (Petrópolis: Vozes), 15-61.

Portal Do Empreendedor Individual Pelo Ministério Do Desenvolvimento, Indústria E Comércio Exterior—MDIC. Disponível em. http://www.portaldoempreendedor.gov.br/modulos/inicio/index.htm. Acesso em jun. 2012.

Santos, C. M. S., et al. (2010). Evoluindo da cadeia de valor para cadeia de suprimentos. *Revista Produção Online, 10*(4), 753–778 Online http://www.producaoonline.org.br/rpo/article/view/402/736.

Sarfati, G. (2013). Estágios de desenvolvimento econômico e políticas públicas de empreendedorismo e de micro, pequenas e médias empresas (MPMEs) em perspectiva comparada: os casos do Brasil, do Canadá, do Chile, da Irlanda e

da Itália. *Revista de Administração Pública, 47*(1), 25–48 Online http://www.scielo.br/scielo.php?pid=S0034-76122013000100002&script=sci_arttext.

Sposito, E. S., & Santos, L. B. (2012). *O Capitalismo industrial e as multinacionais brasileiras*. São Paulo: Outras Expressões.

Silva, C. X. (2009) '*Nos 'fios invisíveis' da terceirização*: *a precarização do trabalho na indústria de confecções*'. *Trabalho de conclusão de curso*, *Centro de Letras e Ciências Humanas*, *Universidade Estadual de Londrina*, Londrina, Brasil.

Tapia, J. R. B. (2005). Desenvolvimento local, concertação social e governança: a experiência dos pactos territoriais na Itália. *São Paulo em Perspectiva, 19*(1), 132–139 Online http://www.scielo.br/pdf/spp/v19n1/v19n1a12.pdf.

8

Creating Space: The Role of the State in the Indian IT-Related Offshoring Sector

Ernesto Noronha and Premilla D'Cruz

Introduction

By facilitating the separation of the production and consumption of services, the information and communication technology (ICT) revolution has transformed the way companies do business (Fernández-Stark et al. 2011). The huge growth in ICT, competition for ICT work and increased economic freedom have made the 'offshoring' of services to developing countries financially attractive for developed countries (Penfold 2008). This has allowed developing countries like India to perform a wide array of skill-intensive activities, particularly in the information technology (IT) services industry, once considered strictly the domain of the industrialised world (Fernández-Stark et al. 2011). Today, India is the worldwide offshore services market leader with a share of 58 per cent of the global outsourcing industry. The aggregate revenues in 2013 were about $108 billion, with exports contributing $75.8 billion of the total industry revenues. As a proportion of national gross domestic product (GDP), the sector has grown from 1.2 per cent to 8 per cent and with regard to the share of total exports, from 4 per cent to 25 per cent between 1998 and 2013, providing direct employment to 3 million

J. Flecker (ed.), *Space, Place and Global Digital Work*, Dynamics of Virtual Work, DOI 10.1057/978-1-137-48087-3_8

people and indirect employment to 9.5 million (NASSCOM 2013). This success of India in IT services in recent years has become an important model for other developing countries to follow (Radhakrishnan 2007). On this road to becoming a market leader, Indian IT firms over the past decades have offered a range of services in the value chain, such as information technology outsourcing (ITO), business process outsourcing (BPO) and knowledge process outsourcing (KPO) (Fernández-Stark et al. 2011), which in this paper we will refer to as IT and related services.

The IT and related services industry has become an icon of development with the gurus of the industry seen as heroes of today's India. This image of Indian IT heroes is not only seen as an antidote to the cynicism that surrounds India's state institutions but also constructs middle class dreams that modern India offers endless global opportunities. Accordingly, the triumph of IT and related services is attributed to individual entrepreneurship set free from the shackles of state intervention in a liberalised, privatised and globalised environment (van der Veer 2005). Thus, the popular view is that the industry expanded on the basis of comparative advantage and there was no explicit effort by the government to galvanise the agglomeration economies which developed spontaneously. The development of the software sector was primarily attributable to the activities of the private sector initiated through a symbiosis of foreign and domestic firms. The governments at various levels became involved only after the success of the sector was evident (Pack and Saggi 2006). In fact, a critical role was played by non-resident Indians (NRI), who had immigrated to the United States in the 1950s, in facilitating the match between buyers of software services from the United States and sellers from India (Kattuman and Iyer 2003) Pack and Saggi 2006: 35. As a result, 'the lamented brain drain became, with some lag, a paradoxical source of strength and a critical catalytic input'. Further, the major impetus to the demand in the 1990s came from a broad set of 'accidents' such as the shift to the Euro and the Y2K problem which enterprising businesses in India capitalised on through the well-known practice of 'bodyshopping', i.e. the contracting out of the services of IT workers (Pack and Saggi 2006). Therefore, the growth of the industry must be attributed to early

liberalisation and benign neglect rather than the active strategic support of the state (Kattuman and Iyer 2003). This popular view often ignores the role of the state in making India a destination for software services. Moreover, the literature which accounts for the state role is limited to physical infrastructure, with little reference to the enabling industrial relations space. This chapter intends to correct this anomaly by also analysing the role of the state in inserting IT and related services employees into global production networks.

We therefore begin the first section with the literature on global production and the state. The second section deals with the role of the state in supporting the IT and related services sector in India, through various fiscal and economic policies including the state intervention in industrial relations, and the final section discusses the response of IT employees to these initiatives.

Global Production Networks and the State

Beginning in the 1990s, a body of literature based upon the analysis of global commodity chains (GCCs), global value chains (GVCs) and more recent global production networks (GPNs) developed, as a means to better understand the shift from state-led import substitution industrialisation policies in favour of an export-oriented development strategy in the contemporary global economy (Barrientos et al. 2011). Some argue that this move, signalling the shift from 'the development project' to 'the globalisation project' (Bair 2005), has resulted in a major secular diminution of state power vis-a-vis firms in GPNs (Petkova 2006), while others argue that most analysis tends to neglect state action, reflecting the myth of the 'withering away' of state intervention in a globalised economy (Smith 2014).

This neglect of the state in GPN analysis is in keeping with the myth that the power of the state to influence the investment decision-making behaviour of global corporations is being eroded inexorably by the unstoppable power of Multinational Companies (MNCs) (Liu and Dicken 2006). Hess and Coe (2006) state that national governments continue to exercise considerable power, not only in setting the context

within which GPNs operate but also in the very constitution of forms of economic integration through GPNs (Smith 2014). It is the state action or inaction that creates the enabling conditions of how firms, regions and nations are able to engage with global markets, and their capacities to upgrade these engagements. This includes policies such as wage setting, tariffs, taxes (and tax concessions), infrastructure provision, education, training and research, and spatial planning (such as the establishment of free trade zones and business hubs) (Neilson et al. 2014). Further, effective state policies and initiatives can enhance the strategic coupling process between local firms and lead firms by enhancing human resources and physical infrastructure in their respective industrial regions (Yeung 2009). Thus, the nation state also lays down the rules of how regions within the country will compete between themselves and with regions elsewhere (Smith et al. 2002).

Nonetheless, the actual situation is far more complex and contingent (Coe et al. 2008). Firms and states are continuously engaged in intricately choreographed and negotiated processes over investment projects (Coe et al. 2008). While Transnational Companies (TNCs) seek investment locations to produce and distribute their goods and services, states seek capital by inserting themselves into firms' GPNs (Liu and Dicken 2006). Similarly, firms attempt to take advantage of national differences in regulatory regimes (Coe et al. 2008) whereas states strive to capture as much as possible of the value created from production within their territories (Liu and Dicken 2006). Notwithstanding these dynamics, a state that controls access to a large, affluent, domestic market has greater relative bargaining power over an MNC than a state whose domestic market is small. However, if a firm's requirement is for access to low cost labour that is widely available in alternative locations, then the bargaining power of any one state will be limited (Liu and Dicken 2006). In this sense, a primary aim of a host state is to try to embed an MNC's activities as strongly as possible in the local/national economy. The firms can be actively embedded or obligatorily embedded. Active embeddedness reflects the situation in which an MNC seeks out localised assets and incorporates them, as a matter of choice, within its operations, whereas when the MNC is forced to comply with state criteria in order to gain access to, and use of, the desired asset, this would be obligated

embeddedness (Liu and Dicken 2006). However, this literature of the role of the state and GPNs focusses on issues of economic governance that sustain accumulation, with little mention of how the state impinges on industrial relations and labour policy. The minimal literature available on the issue argues that the spatial dispersion of production has weakened state mechanisms for the guarantee of labour rights (Siegmann et al. 2014), while supporting national capital accumulation that is assumed to bring about national economic change and societal transformation. The state, in its enthusiasm to assist national capital accumulation, has complicitly contributed to uneven development (D'Costa 2011).

In this context, we now examine the growth of the Indian IT and related services industry. As discussed above, the success of the IT and related services industry in India is often attributed to globalisation and market forces which are detrimental to the state but a closer look reveals that the Indian state attempted to actively embed[1] itself in the growth of the industry. While there is a substantial body of literature that emphasises the role of the state to prop up the Indian IT and related services industry the literature on the role of the state in the arena of industrial relations is fragmented and scattered. This chapter brings the two sets of literature together to provide a more holistic picture of the state intervention in the IT and related services industry in the next two sections.

Facilitating Spatial Development: the Role of the Indian State

Over the years, the software value chain has changed significantly from being vertically integrated with hardware to a decentralised system based on object oriented programming and distributed programming. This also enabled the highly skilled work of software development to be broken into a series of relatively standardised production steps starting with the analysis of the problem, design, coding, testing, delivery and installation

[1] In this paper embeddedness implies a concrete set of connections that link the state intimately and aggressively to particular social groups with whom the states share a joint project of transformation (Evans 1995).

and finally maintenance of the software (Heeks 1996). The early stages of conceptualisation and design -->involve heterogeneity and innovative work, but this declines at stages of testing and implementation (Rothboeck et al. 2001; Sahay et al. 2003). Nonetheless, this fragmentation, together with the rapid improvements in communications technologies and globalisation, opened a window of opportunity for countries such as India, which are rich in human capital, to get involved in the IT value chain as an adjunct to the core economy.

By the late 1980s and early 1990s, most Indian software companies acted as sub-contractors, executing assignments onsite (at the client's premises) through manpower contracts popularly known as 'bodyshopping' (Nath and Hazra 2002, Xiang 2007). Gradually, first generation Indian engineers, working in Silicon Valley, convinced senior management of large American corporations to take advantage of wage arbitrage for software skills and establish operations in India (Saxenian 2002, Nath and Hazra 2002). Thus, the global service delivery (GSD) model in which Indian firms maintained headquarters in India, delivery centres in developing countries and customer support offices near their clients in the developed world was created (Fernández-Stark et al. 2011). This offshore development of software indicated a broadening of the international division of labour (Lakha 1994).

Whilst the international division of labour is underpinned by the global strategies of MNCs, development policies pursued by states are important too (Lakha 1994). The emergence of the Indian software industry is an outcome not only of an explosion in global demand for high-skill and low-wage software professionals, but also of the changing role of the Indian state (Parthasarathy 2004). Nollen (2007) for instance, argues that from its very early years the government was very active in promoting the software industry by first being a regulator and producer and later taking on the role of a promoter and supporter (Heeks 1996). Initially, the state protected the IT and related services industry from competition by placing import controls on hardware, imposing a 100 per cent import tariff on software and refusing to allow any overseas sales offices until 1979. In fact, one of the most notable policies of the 1970s, the Foreign Exchange Regulation Act (FERA) of 1973 was designed to foster India's infant software industry by driving out several major firms such as IBM, and leading

to the establishment of the Computer Maintenance Corporation (CMC), a public sector company that developed software and hardware for local and overseas markets. This company created a substantial skill base of workers who later migrated to the United States to seek better employment opportunities in an open market (Aggarwal 2013). Besides this, the genesis of Bengaluru's (formerly known as Bangalore) emergence in the 1990s as a hub in the global knowledge economy may be traced back to Nehru's decision in the 1950s to locate the strategic public sector defence and electronics industry in the city (Parthasarathy 2004). Consequently, if not for the state's investment in technological and educational infrastructure in the 1960s and 1970s—designed for import-substitution industrialisation—the IT and related services industry would not have been in the position to exploit the emerging opportunities in the 1980s (D'Costa 2011). Thus, until the 1980s, the IT and related services industry was guided by a protectionist strategy. However, since then the government has slowly begun to rein back these policies to make the software industry better prepared for international competition (Aggarwal 2013), it has focused on promotion and support to the industry rather than control and ownership (Heeks 1996).

The Computer Policy of 1984 was aimed at reducing the regulatory constraints while providing promotional and infrastructural support (Parthasarthy 2013). This policy encouraged the import of hardware for the purpose of Indian software development and removed equity limits for fully export-oriented projects, which led to an influx of multinational corporations (Aggarwal 2013). Alongside this change to a more liberalised economic environment there was also a shift in the approach to policy making where inputs from the employers' body—the National Association of Software and Services Companies (NASSCOM), founded in 1988, began to play an important role. The state increasingly embedded itself in private capital by making policies that drew on industry feedback (Parthasarathy 2004). This growing embeddedness of the state was reflected in the establishment of the software technology parks (STPs) in 1990. As export zones dedicated to the software industry, the STPs offered data communication facilities, uninterrupted electricity, concessional land, centralised air conditioning, tax free status for 100 per cent export-oriented firms, financial and marketing support and financial

incentives for firms to provide offshore services (Aggarwal 2013; Chatterji 2013; D'Costa 2011; Parthasarthy 2013) The STPs not only provided the necessary infrastructure to reinforce the skill advantages which a region like Bengaluru already possessed but were also instrumental in firms shifting from 'bodyshopping' services to offshore services. This shift to offshore services marked the beginning of a new relationship between the Indian software industry and global markets (Parthasarthy 2013), leading to its integration into the global division of labour (Lakha 1994).

In addition to national policies, in recent years governments at the state level have also competed to announce their own IT and related service policies, to attract investments. The state governments offer a range of fiscal benefits to the IT and related services sector, which include: rebates in property registration fees and stamp duty exemption; entry tax and sales tax exemption; and reduced power tariffs. Besides this, IT and related services projects also receive several additional exemptions from city-level zoning regulations which include location policy irrespective of local area master plans, additional building heights or floor area ratio. State agencies are also attempting to expand the spatial footprint of the IT and related services industry beyond the metropolitan regions by establishing business parks in smaller towns. Almost all states have extended certain regulatory exemptions related to labour and environmental laws to the IT and related services sector, which enable them to run 24/7 schedules for 365 days on a shift basis, to serve their clientele spread across several time zones on a real time basis (Chatterji 2013). To sum up, the state unintentionally led the industry, and later allowed the market to follow while continuing to provide fiscal and infrastructural support (D'Costa 2011).

However, the state's greatest contribution to the software industry is arguably its development of human capital that was a low cost, highly educated, engineering workforce with strong English abilities (Aggarwal 2013). This is evident from the fact that India's southern states, such as Karnataka, Tamil Nadu, and Andhra Pradesh, which have expended greater resources in technical education, dominate the industry (D'Costa 2011). In fact, Arora et al. (2001) contend that those states that had a higher stocks of human capital were favoured locations for software development since the states with larger engineering baccalaureate capac-

ity, particularly in the 1980s and early 1990s, were more likely to have produced engineers who emigrated to the US and later helped in connecting Indian software exporters in their home states with clients in America, or themselves setting up software firms to service American clients. Nonetheless, the role of the state is not confined to the provision of infrastructure facilities and development of human capital but extends to other spheres such as the mediation of different class interests, including those of foreign capital (Lakha 1994).

The State and the Industrial Relations Space

In the context of the IT and related services employers' argued that the presence of unions hampers the macroeconomic environment and threaten the flow of foreign direct investment (FDI) into India spelling disaster for the fledgling ITES-BPO industry in the country. They went on to highlight that India has achieved a significant milestone in this industry because of the absence of unions, hence third-party intervention did not augur well for its future (Noronha and D'Cruz, 2009a,b). Undoubtedly, the very nature of capital and growing threat posed by emerging offshoring–outsourcing destinations in Asia and South America, enabled employer organisations to propagate this view among employees (Noronha and D'Cruz, 2006) that a collectivist agenda is at odds with business interests, and pursuing such a path would unleash conflict into a favourable context. Similarly, it was often wrongly concluded that as employers provided exceptionally good work environments, salaries and benefits and sophisticated HR practices IT and related services did not fall within the purview of labour laws (D'Cruz and Noronha, 2010). Given the perception that the IT industry is best left to private initiatives and responses to market signals, the state has increasingly withdrawn from the regulation of the sector (Chandrasekhar 2005). Consequently, the dialogue between government and IT and related services firms aims at allowing the sector to function with minimal red-tape and maximum labour flexibility (Penfold 2008). At the national level, the Chief Labour Commission (Central)(CLC[C]) Office has advised their subordinate offices that routine and periodic inspections may not be necessary since

the employees engaged by these IT and related services are usually qualified and therefore, are in a better position to protect and promote their interests (GOI 2009–10), while at the state level IT and related services companies are allowed to self-certify[2] in respect of laws such as the Payment of Wages Act 1936, the Minimum Wages Act 1948, the Contract Labour (Regulation and Abolition) Act 1970, the Workmen Compensation Act 1923 and the Employees' State Insurance Act 1948, besides others. As a result, D'Cruz and Noronha (2010) note that the popular notion held in Indian society (and maintained and promoted by IT and related services sector employers, aided by government apathy) is that labour legislations and related institutional measures do not apply to this sector, and hence IT and related services sector employees do not come under the purview of the labour laws applicable to blue collared workers (see Sarkar and Mehta 2010), which is misleading (see Noronha and D'Cruz 2009a). Rather, most state governments have exempted IT/ITES organisations from their respective Shops and Establishment Acts allowing them to operate 365 days in a year, seven days a week and 24 hours a day. Employees who work for more than eight hours a day need not be paid overtime wages if the working hours do not exceed 48 per week. Further, young persons and women can be employed during the night shift subject to the provision of adequate security and transport to and from their respective residences. While, given the nature of the offshoring business, these exemptions are required to make the operations of the IT and related services industry feasible, the blanket exemption of the Standing Orders Act 1946[3] provided by the states to the IT and related services industry has denied employees any protection against employer abuse.

The state government of Karnataka first exempted the IT and related services sectors from the applicability of the Standing Orders Act 1946 in the year 1999, thereafter the exemption has been extended every two years (Ramkumar n.d.). The most recent extension was granted on 25

[2] 'Under the self-certification scheme, employers employing up to 40 persons are required to provide only a self-certificate regarding compliance to labour laws, while those employing 40 or more persons are required to submit a self-certificate duly certified by a chartered accountant' (ILO 2014).

[3] The Standing Orders Act is a set of rules which pertains to misconducts, dismissal procedures, probation period and notice period to be given at the time of resignation, benefits and protection for workers against unfair treatment or wrongful exactions by the employers.

January 2014 for a period of five years to IT and related services companies. Not to be left behind, other states such as Maharashtra, Gujarat, Haryana, Tamil Nadu, Andhra Pradesh, Orissa, Rajasthan and Madhya Pradesh have also granted exemptions (ITEC n.d.). In the recent exemptions, NASSCOM has lobbied the Karnataka government, arguing that the implementation of the Standing Orders Act 1946 would deter investment and in the process hurt employment. They also argue that the Act is outdated and does not fit the present day requirements of a knowledge based industry, such as allowing flexible working hours and teleworking (Navya 2013). Moreover, employers have formulated their own working norms, guidelines and practices (Kwang 2012) that provide employees with good pay, facilities and fair treatment that go beyond the provisions of any law (Navya 2013). Even those workers performing at the lower end of offshore services in India often have good wages and working conditions with attractive work spaces, subsidised transport, health insurance and many other benefits by local standards (Penfold 2009). Employers argue that sophisticated human resource management (HRM) strategies have a significant potential to take care of the interests of educated 'executives' who have a voice of their own (Noronha and D'Cruz 2006, 2009b), and IT and related services organisations have developed an elaborate email system for conflict resolution allowing access to top management and do not require the protection of unions (Rothboeck et al. 2001). Further, the implementation of the Standing Orders Act 1946 would only protect non-performing employees who could form unions to keep their jobs (Kwang 2012). Even employees argued that unions were not relevant in workplaces where employees' interests were being compromised and basic facilities, including redressal mechanisms, were not in place or not functional (Noronha and D'Cruz 2006, 2009b).

On the other hand, employee organisations like the ITEC (IT and ITeS Employees Centre) argue that the blanket exemption from the Industrial Employment (Standing Orders) Act, 1946 allows employers to be abusive. For instance employees are threatened with blacklisting and non-issue of a service certificate, forcing IT and related services employees to comply with the management (Ramkumar n.d.). In fact employees were afraid of filing formal complaints for the fear of not getting good references or relieving letters from the company for their next job (Navya

2013). Management held the 'unchallenged authority to terminate without prior notice' (Ramesh 2004), in some cases carrying out depersonalised bullying (D'Cruz and Noronha 2009). The inhuman way of terminating employees' employment through forced resignations was rampant, especially during any downturn (D'Cruz and Noronha 2013). However, legislation that gives those employed for over six months a right of appeal against dismissal without reasonable cause is not often invoked by IT and related services employees, given the difficulty and delay in the legal system, the ease of finding another job in the sector (Penfold 2008) and the perception of being professionals (Noronha and D'Cruz 2006, 2009b). Besides this, benefits are withdrawn without a dialogue, companies do not provide procedures for acting against sexual harassment and there exists a system of long working hours (Ramkumar n.d.). Moreover, in the IT and related services sector working late does not imply being paid overtime. The salary is fixed, regardless of the hours worked (Baas 2007). Further, though legislation requires the availability of maternity leave, evidence suggests that those seeking to take maternity leave are often encouraged to resign (Penfold 2008). The predominance of the organisational agenda that was embodied in the 'sacrificial HR strategy' only exacerbated the existing rate of attrition arising from job design elements. The rhetoric of non-hierarchical organisational structures, career advancement, workplace ambience and transparency designed to strengthen employee commitment to organisational goals and reduce the incidence of absenteeism and intention to quit, failed due to lack of any meaningful consultation with employees or their representatives (D'Cruz and Noronha 2012). In fact, in the Indian context, far from consulting employees, high commitment management practices are advocated as a means to ensure union avoidance (Noronha and D'Cruz 2009b).

This fear of unionisation disregards the basic freedoms provided by the Indian Constitution (Ramkumar n.d.). Of course, this is exacerbated by the fact that while the industry employers themselves form legitimate associations such as the National Association of Software and Services Companies (NASSCOM) and the Business Process Industry Association of India (BPIAI)—the same privilege is denied to workers in the sector (Jose 2012). Further, this is an area where fundamental rights are either not being accorded by employers, and/or are not being pursued by work-

ers (Penfold 2008). Besides being influenced by the anti-union position espoused by their employers, employees feared adverse reactions, including dismissal, should their employers learn about their links with a union (Noronha and D'Cruz 2009a, b). Thus, the rights employees were afforded under legislation to form and join trade unions were ineffective in practice as workers fear reprisals for pursuing them (Penfold 2008). This has made it increasingly difficult for labour, whether individually or collectively, to make demands on employers at a local level.

Further, when clients can readily source labour from multiple locations, the possibility of work being taken elsewhere discourages labour from pressing for even the most legitimate demands (Penfold 2008; Noronha and D'Cruz 2006). Therefore, according to unions, the only way to ensure compliance with decent labour standards was to establish global framework agreements (GFAs) which included clauses on employees' rights, union rights, health and safety, elimination of discrimination, minimum wages and working conditions, employment stability, respect for others at work and respect for the environment (Noronha and D'Cruz 2009a, b). However, GFAs relating to offshored work are commonly negotiated between unions and large corporations in Europe and the UK, providing for the treatment of staff affected by offshoring in developed nations and labour at offshored destinations, but corporations refuse to bargain collectively with workers in countries such as India (Penfold 2008). For instance, in spite of untiring efforts to sign a GFA with HSBC worldwide the initiative has not paid off. As a part of the global campaign for a GFA, when UNITES leaders in India went to hand over a written representation to HSBC Hyderabad they were stopped, with the bank retorting that at HSBC they were committed to fair employment practices and they did not see the need for any global agreement.

Conclusion

It is often argued that the success of the Indian IT and related services sector is largely due to the abundant highly qualified labour and its facility with the English language, available at relatively cheap prices. This view is in line with the neoliberal view which often ignores the role of the

state in promoting the IT and related services industry. Initially, the state played a protectionist role and later, as promoter and supporter, actively embedded itself in the industry by providing for tax holidays and infrastructure facilities, signalling the shift from 'the development project' to 'the globalisation project' (Bair 2005). The Indian state created the enabling conditions for Indian IT firms to engage with global markets by particularly enhancing the quality of human resources. The southern states of India, particularly Karnataka, Tamil Nadu, and Andhra Pradesh, which expended greater resources in technical education, dominate the industry. However, the role of the state in providing industrial relations space to entice FDI investment has often been ignored. The state governments repeal labour legislations by granting exemptions. Exemptions granted under the various Shops and Establishment Acts have been necessary for the working of the IT services industry given the nature of offshoring but the blanket exemption of the Standing Orders Act 1946 strikes at the basic rights of the worker. Most of the issues afflicting workers such as terminations, promotions, benefits, and so on in the IT and related services industry are simply set aside by providing exemptions under the Standing Orders Act 1946. On one hand, it is clear that the sophisticated HR practices are not enough to take care of the injustices meted out to employees, while on the other hand, the fear of reprisals by employers has made joining trade unions ineffective in practice. Added to this, the possibility of work being outsourced to other destinations discourages labour from pressing for even the most legitimate demands. Framework agreements relating to offshored work commonly negotiated between unions and large corporations have been non-starters in vendor countries. Thus, getting inserted into the GPN has been good for the industry but has not been particularly good for workers as far as employee voice is concerned.

References

Aggarwal, S. N. (2013). Government bytes: Industrial policy in the Indian software industry Berkeley APEC study center. Working Papers Series 13-02.

Arora, A., Gambardella, A., and Torrisi, S. (2001). In the footsteps of Silicon Valley? Indian and Irish Software in the International Division of Labour. Discussion Paper No. 00-41. Stanford Institute for Economic Policy Research, Stanford University: Stanford (CA).

Bair, J. (2005). Global capitalism and commodity chains: Looking back, going forward. *Competition & Change, 9*(2), 153–180.

Barrientos, S., Mayer, M., Pickles, J., & Posthuma, A. (2011). Decent work in global production networks: Framing the policy debate. *International Labour Review, 150*(3–4), 299–317.

Baas, M. (2007). Bangalore @ night: Indian IT professionals and the global clock ticking. *Etnofoor, 20*(2), 59–72.

Chandrasekhar, C.P. (2005). The diffusion of information technology: The Indian experience. In ICTs and Indian Economic Development: Economy, Work, Regulation, by Ashwani Saith and M. Vijaysbaskar (eds.), (New Delhi: Sage Publications).

Chatterji, T. (2013). Localizing production of the globalized knowledge enclaves: The role of the sub-national states in development of the IT-ITES clusters in India. In P. Cooke, G. Searle, & K. O'Connor (Eds.), *The economic geography of the IT Industry in the Asia pacific region (regions and cities)* (pp. 243–263). New York: Routledge Taylor & Francis Group.

Coe, N. M., Dicken, P., & Hess, M. (2008). Global production networks: Realizing the Potential. *Journal of Economic Geography, 8*(3), 271–295.

D'Costa, A. P. (2011). Geography, uneven development and distributive justice: The political economy of IT growth in India. *Cambridge Journal of Regions, Economy and Society, 4*(2), 237–251.

D'Cruz, P., & Noronha, E. (2009). Experiencing depersonalized bullying: A study of Indian call centre agents. *Work Organization, Labour and Globalization, 3*(1), 26–46.

D'Cruz, P., & Noronha, E. (2010). Employee Dilemmas in the Indian ITES-BPO sector. In J. C. Messenger & N. Ghosheh (Eds.), *Offshoring and Working Conditions in Remote Work*. Basingstoke and Geneva: Palgrave Macmillan and ILO.

D'Cruz, P., & Noronha, E. (2012). High commitment management practices re-examined: The case of Indian call centres. *Economic and Industrial Democracy, 33*(2), 185–205.

D'Cruz, P., & Noronha, E. (2013). Workplace bullying in the context of organizational change: The significance of pluralism. *Industrial Relations Journal, 45*(1), 2–21.

Evans, P. B. (1995). *Embedded autonomy: States and industrial transformation*. Princeton, NJ: Princeton University Press.

Fernández-Stark, K., Bamber, P. & Gereffi, G. (2011). *The offshore services global value chain. Economic upgrading and workforce development*. Duke University, Center on Globalization, Governance and Competitiveness.

GOI (2009–10). Annual report, *Ministry of Labour and Employment* (Government of India).

Heeks, R. (1996). *India's software industry: State policy, liberalization and industrial development*. New Delhi: Sage Publication.

Hess, M., & Coe, N. M. (2006). Making connections: Global production networks, standards, and embeddedness in the mobile-telecommunications industry. *Environment and Planning A, 38*(7), 1205–1227.

ILO (2014). Observación. Retrieved October 4, 2015, from http://www.ilo.org/dyn/normlex/es/f?p=1000:13100:0::NO:13100:P13100_COMMENT_ID:3190722.

ITEC (n.d.) Research brief—Standing orders act, IT industry. Retrieved from, http://www.itecentre.co.in/?q=node/88

Kattuman, P., & Iyer, K. (2003). Human capital in the move up the value chain: The case of the Indian software and services industry. In E. Giovannetti, M. Kagami, & M. Tsuji (Eds.), *The Internet revolution: a global perspective* (pp. 162–179). Cambridge: Cambridge University Press.

Kwang, K. (2012). India's IT industry faces labor law hurdle. Retrieved from, http://www.zdnet.com/article/indias-it-industry-faces-labor-law-hurdle/

Lakha, S. (1994). The new international division of labour and the indian computer software industry. *Modern Asian Studies, 28*(2), 381–408.

Liu, W., & Dicken, P. (2006). Transnational corporations and obligated embeddedness: Foreign direct investment in China's automobile industry. *Environment and Planning A, 38*(7), 1229–1247.

NASSCOM (2013). *The IT-BPM sector in India. Strategic review 2013*. New Delhi: NASSCOM.

Nath, P., & Hazra, A. (2002). Configurations of Indian software industry. *Economic and Political Weekly, 37*(8), 737–742.

Navya, P. K. (2013). IT firms have to follow standing orders: Are they ready?. Retrieved from, http://bangalore.citizenmatters.in/articles/5002-it-firms-have-to-follow-standing-orders-are-they-ready

Neilson, J., Pritchard, B., & Yeung, H. W. (2014). Global value chains and global production networks in the changing international political economy: An introduction. *Review of International Political Economy, 21*(1), 1–8.

Nollen, S. (2007). Software industry performance in India and China. Academy of International Business—India Chapter conference 'India in the Emerging Global Order'. Xavier Institute of Management Bhubaneswar, India.

Noronha, E., & D'Cruz, P. (2006). Organising call centre agents: Emerging issues. *Economic and Political Weekly, 41*(21), 2115–2121.

Noronha, E., & D'Cruz, P. (2009a). *Employee identity in Indian call centres: The notion of professionalism*. New Delhi: Sage/Response.

Noronha, E., & D'Cruz, P. (2009b). Engaging the professional: Organising call centre agents in India. *Industrial Relations Journal, 40*(3), 215–234.

Pack, H., & Saggi, K. (2006). *The Case for industrial policy: A critical survey*, *Policy Research Working Paper, no. 3839*. Washington, DC: World Bank.

Parthasarathy, B. (2004). India's silicon valley or silicon valley's India?: Socially embedding the computer software industry in Bangalore. *International Journal of Urban and Regional Research, 28*(3), 664–685.

Parthasarathy, B. (2013). A half century of envisioning in future in Bangalore: From autarky to innovation in the global information economy. In P. Cooke, G. Searle, & K. O'Connor (Eds.), *The Economic Geography of the IT Industry in the Asia Pacific Region (Regions and Cities)* (pp. 221–242). New York: Routledge Taylor & Francis Group.

Penfold, C. (2008). Off-shoring and decent work: Worlds apart? *The International Journal of Comparative Labour Law and Industrial Relations, 24*(4), 573–594.

Penfold, C. (2009). Off-Shored services workers: Labour law and practice in India. *The Economic and Labour Relations Review, 19*(2), 91–106.

Petkova, I. (2006). Shifting regimes of governance in the coffee market: from secular crisis to a new equilibrium? *Review of International Political Economy, 13*(2), 313–339.

Jose, S. P. (2012). *Rebalancing labour laws in the IT sector*. Retrieved from, http://www.pragoti.in/node/4644

Radhakrishnan, S. (2007). Rethinking knowledge for development: Transnational knowledge professionals and the New India. *Theory and Society, 36*(2), 141–159.

Ramkumar (n.d.). Standing orders' and IT industry. Retrieved from, http://www.itecentre.co.in/node/156

Ramesh, B. (2004). Cybercoolies in BPOs. *Economic and Political Weekly, 39*(5), 492–497.

Rothboeck, S., Vijaybhaskar, M., & Gayatri, V. (2001). *Labor in the Indian economy: The case of the Indian software labor market*. New Delhi: ILO.

Sahay, S., Nicholson, B., & Krishna, S. (2003). *Global IT outsourcing: Software development across borders*. Cambridge: Cambridge University Press.

Sarkar, S., & Mehta, B. S. (2010). Global production networks and decent work: Recent experience in India and global trends. In A. Posthuma & D. Nathan (Eds.), *Labour in Global production networks in India* (pp. 321–347). New Delhi: Oxford University Press.

Saxenian, A. (2002). Transnational communities and the evolution of global production networks: The cases of Taiwan, China, and India: Forthcoming in industry and innovation. Special Issue on Global Production Networks, *Fall*, 1–35.

Siegmann, K. A., Merk, J. and Knorringa, P. (2014). Voluntary initiatives in global value chains towards labour-led social upgrading? Working Paper No. 586 (CIRI working paper no. 4), 1–24. Retrieved from, http://www.iss.nl/news_events/iss_news/detail/article/63356-wp-586-voluntary-initiatives-in-global-value-chains-towards-labour-led-social-upgrading-b/

Smith, A. (2014). The state, institutional frameworks and the dynamics of capital in global production networks. *Progress in Human Geography*, 1–26. doi:10.1177/0309132513518292.

Smith, A., et al. (2002). Networks of value, commodities and regions: Reworking divisions of labour in macro-regional economies. *Progress in Human Geography, 26*(1), 41–63.

van der Veer, P. (2005). Virtual India: Indian IT labor and the nation–state. In T. B. Hansen & F. Stepputat (Eds.), *Soverign bodies: Citizen, migrants, and states in the postcolonial world* (pp. 276–290). Princeton, NJ: Princeton University Press.

Yeung, H. W. (2009). Regional development and the competitive dynamics of global production networks: An East Asian perspective. *Regional Studies, 43*(3), 325–351.

Xiang, B. (2007). *Global "body shopping": An Indian labour system in the information technology industry*. Princeton, NJ: Princeton University Press.

Part III

Dynamics of Virtual Organisation and Mediatised Work

9

‘My Company is Invisible’—Generating Trust in the Context of Placelessness, Precarity and Invisibility in Virtual Work

Nora C. Koslowski

Introduction

This chapter examines how placelessness, precarity and invisibility are experienced in virtual work and analyses the coping strategies used to generate trust by the employee in this context. Challenges posed by working at a distance away from the organisation have received considerable attention. For example, the mobility and flexibility inherent in virtual work creates risks of work-life conflict, work intensification, workaholism, and 24/7 connectivity (Leonardi et al. 2010; MacCormick et al. 2012; Derks et al. 2014; Porter and Kakabadse 2006; Greenhill and Wilson 2006; Hilbrecht et al. 2008; Kelliher and Anderson 2010; Mirchandani 2000; Russell et al. 2009). However, paradoxically, being constantly available through ICTs (Wajcman and Rose 2011) can coincide with experiences of loneliness, isolation, worry and guilt (Collins 2005; Haddon and Lewis 1994; Kurland and Bailey 1999; Mann and Holdsworth 2003; Felstead et al. 2005; Sullivan 2000).

Further, those working away from the office can find themselves as outsiders to an organisation, with lower pay, impaired career progression, and lower levels of support and training (Haddon and Lewis 1994; Tietze 2002;

J. Flecker (ed.), *Space, Place and Global Digital Work*, Dynamics of Virtual Work, DOI 10.1057/978-1-137-48087-3_9

Mirchandani 1998a, Mann and Holdsworth 2003). Kolb et al. (2012: 271) suggest that researchers need to understand how people 'manage the extreme states of anywhere/anytime computing *or* cases of extreme isolation'. In the case of people who work virtually, isolation and anytime/anywhere availability through technology coexist, providing a complex and rich research site. This chapter attempts to map out the places in which a virtual worker conducts her working life. It investigates how the transient nature of virtual work is navigated and how coping strategies are developed in order to generate trust. Trust is conceptualised in this chapter as 'the exercise of control that renders people and events more predictable' (Grey and Garsten 2001: 232), rather than a more utopian notion of trust as mutual understanding, reflecting the nature of the virtual work relationships described in this chapter, which are characterised by having to prove being a reliable worker.

Placelessness, Precarity and Invisibility in Virtual Work

As virtual work happens anywhere, at any time, it is easy to neglect the places in which virtual work is conducted. Indeed, according to Agnew (2011: 5), 'space is conquering place' as new technologies make the need for specific places redundant. However, all human activities, even those happening in the virtual world, make reference to particular places, and in this chapter explicit attention is paid to the places, or lack thereof, in virtual work. Place in this chapter is viewed as a specific location (e.g. a country or city), while space is seen as relational (Agnew 2011; Visconti et al. 2010; Merrifield 1993; Massey 1984). Interestingly, place can also be understood as a 'sense of place' (Agnew 2011); as alignment with a particular community, which raises the question of how belonging in communities is negotiated by virtual workers who are removed from defined places. Looking at place and space through the lens of labour relations, it has been suggested that:

> *Locations that, for capital, are a (temporary) space for profitable production, are for workers, their families and friends places in which to live, places in which they have considerable individual and collective cultural investment*;

> *places to which they are often deeply attached, and which may hold powerful emotional ties and socially endowed symbolic meaning for them.* (Beynon and Hudson 1993: 182)

This suggests that workers are attached to fixed places, while capital is mobile and associated with fluid spaces. Similarly Merrifield (1993: 522) talks of place as the location for everyday life and as the site 'for basic social practices—consumption, enjoyment, tradition, self-identification, solidarity, social support and social reproduction' , while space is conceptualised as a process and as 'material flows of commodity, money, capital and information which can be transferred and shifted across the globe' (Merrifield 1993: 521). Visconti et al. (2010), in similar vein, treat space as something anonymous and as a non-place.

While virtual work may not be tied to any particular place and may be operating in a more undefined, anonymous online space, with ever-eroding boundaries, it remains to be seen whether becoming removed from particular places is unproblematic and how virtual workers deal with it in their lived experiences. In short, if place is a specific location, and space is more open, space becomes not so much a question of *where* something happens, but a question of how social relations are negotiated (Ellem and Shields 1999). Essentially, then, this chapter delves into place by taking into account the locations from which virtual work happens; however, the focus will be on the negotiation of social relations, on the positioning of the virtual worker in the organisation, and as such on *relational space*.

Existing research on the relations between virtual workers and their employing organisation and non-virtual colleagues have suggested that it is possible to feel close to geographically distant colleagues and that it is not distance per se that should be of concern, but rather the 'perceived proximity' virtual workers feel to colleagues (Wilson et al. 2008). This 'perceived proximity' is impacted by the level of identification with the organisation and communication between colleagues (Wilson et al. 2008). In contrast, Koroma et al. (2014) conceptualise those who work in a mobile manner away from the office as 'lonely riders' who do not become part of the work community and report feelings of marginalisation.

There is further evidence to suggest that those working from home, such as virtual workers, struggle with legitimising the work they do at home (Mirchandani 1998a, b, Brocklehurst 2001; Tietze and Musson 2005). According to Halford (2005), legitimacy is threatened because of the meanings attached to places, and to the concepts of absence and presence. Hislop and Axtell (2007) similarly emphasise that where work takes place matters for mobile workers because places affect the type of work that can and cannot be done. Further, Hislop and Axtell (2007) suggest that spatial mobility shapes colleague relationships in the sense that spontaneous interactions are lost and communication must become more planned. Thus the potentialities of 'anytime, anyplace' virtual work are not without risks and challenges for being considered a serious worker within the organisation.

Related to legitimacy issues in virtual work are concerns over worker precarity and a casualisation of labour, based on Standing's (2011) suggestion that labour market flexibility transfers risks and insecurity onto workers. The 'precariat', which includes vulnerable workers such as virtual workers, can be used and discarded at will. Gold and Mustafa (2013), in studying home-based self-employed professionals, show that these workers, because of their income insecurity, prioritise work over home and maintain norms of instant responsiveness to clients. A more extreme example of precarity and insecurity is Bergvall-Kåreborn and Howcroft's (2014: 215) research on Amazon Mechanical Turk, where 'relationships are fleeting and largely anonymous, with no obligation to provide support or facilities for the workforce'. While this chapter does not describe self-employment or micro-work such as Mechanical Turk, these lines of inquiry do point towards a potential for eroded, exploitative and precarious relationships in virtual work.

Related streams of research add to the analysis of relationships between virtual workers and their organisations the layer of technology as mediator. For example, Vayre and Pignault (2014) suggest that while technology enables interaction between those who work away from the organisation and those on site, relationships are of a strictly professional nature. Mazmanian et al. (2013) found that while knowledge workers perceived their use of a mobile device as increasing work autonomy, by constantly using the device they escalated expectations of availability and diminished

their autonomy. Cavazotte et al. (2014) critique Mazmanian et al.'s (2013) 'autonomy paradox' by viewing professionals who used smartphones for work as 'active and conscious players' (Cavazotte et al. 2014: 85) in allowing work to expand into their personal lives. Siebert and Wilson (2013: 718), however, highlight that 'the nature of exploitation is that individuals may not perceive what is happening to them as exploitation'. This raises questions over whether the coping strategies used by virtual workers to be trusted by their organisation are a matter of choice or necessity.

Leonardi et al. (2010) position individuals as active agents by showing that those who work away from the organisation consciously regulate their online visibility in order to be able to work in peace. More nuanced patterns of individual preferences in managing technology to connect to the employing organisation have been suggested by Matusik and Mickel (2011) and MacCormick et al. (2012), who categorise workers along a spectrum of being constantly available and resisting constant connectivity. These useful studies demonstrate that the functions of technology interact with individual preferences, social norms and negotiation of who one is within the organisation, which lead to varying strategies of connecting with the organisation.

As we will see in this chapter, the information space opened up by technology is the only realm through which belonging in the employing organisation can be negotiated in the virtual work reported here, and as such the kinds of technologies used by the virtual worker and their affordances play an important role in the navigation of the employment relationship. It is therefore important at this point to comment on the perspective adopted in this chapter on tensions between determination versus agency in technology use. While this chapter investigates how a virtual worker appropriates technology to navigate and cope with the placelessness of virtual work, it is not the technology that dictates how a virtual worker goes about her day (Wajcman and Rose 2011; Orlikowski 2007; Hislop et al. 2013). Instead, the material (technology) is intertwined with the social (how technology is used by virtual workers): 'There is no social that is not also material, and no material that is not also social' (Orlikowski 2007: 1437). This means that while the technology used by virtual workers has certain functions, such as being able to see which colleagues are online, these functions are tied up with the norms created

in communities of practice regarding how functions should be used, and with individual preferences and choices.

In short, this chapter aims to examine how placelessness, precarity and invisibility are experienced in virtual work. The research question to be addressed is '*what are the coping strategies used by virtual workers to generate trust in the context of placelessness, precarity and invisibility*?' In order to address the question, the findings section maps the places in which virtual work takes place. It then discusses the consequences of mobility, and finally moves on to coping strategies to generate trust, with consideration of how technology is used for this purpose. As there is a focus on relational space in this chapter and on how a virtual worker navigates the relationship with the employing organisation, the theoretical framework of 'levels of participation' is used to generate insight into the kind of relationship that is established.

Theoretical Framework—Levels of Participation

This chapter adopts the theoretical concept of 'levels of participation' (Wenger 1998) and the possibilities of core, peripheral, and marginal membership, in order to explore how a virtual worker constructs her positioning in the organisation, and whether this can give us new insight into how the relational spaces of virtual work are navigated. 'Levels of participation' as a concept is rooted in Wenger's (1998) work on communities of practice. Communities of practice (Wenger 1998) are characterised by mutual engagement, joint enterprise, and shared repertoires. Put simply, a community of practice develops when people interact with one another on an ongoing basis and have shared goals and meanings. However, the meaning that is ascribed to how virtual workers participate in their communities of practice is wider than just what they do and with whom at work:

> *Participation here refers not just to local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities. Participating in* […] *a work team, for instance, is both a kind of action and a form of belonging.* (Wenger 1998: 4)

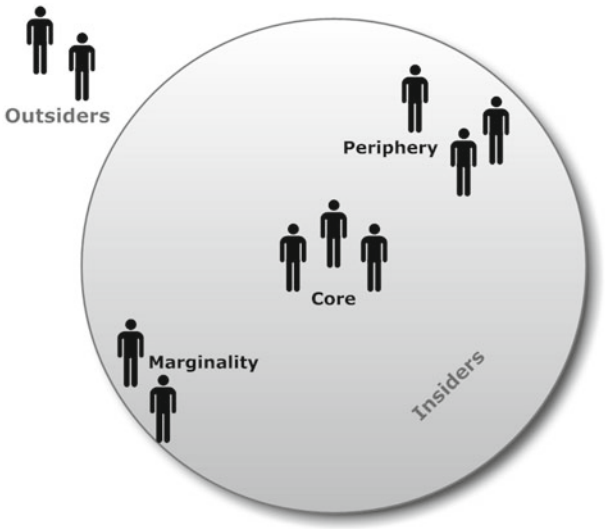

Fig. 9.1 Levels of participation

Therefore participation spans the dimensions of 'community' (where do I belong?), 'identity' (who am I in this community?), 'meaning' (how do I make sense of my participation in this community?), and 'practice' (what do I do in this community?). People can be situated at the core of a community of practice, at the periphery, or at the margins (see Fig. 9.1). Levels of participation are useful for conceptualising different experiences of connecting with a community of practice. These levels are co-constructed in the interaction between the individual and the community, hence there is fluidity between the different levels and positions are not fixed (Wenger 1998).

Core members (see Fig. 9.1) are fully engaged in a practice and influence its development (Wenger 1998). It can be suggested that core members would align who they are with this community, they would engage in tasks that are important for the functioning of the community and they would use their membership in the community to make sense of their world.

Those on the periphery, in contrast, are neither fully inside nor fully outside a community (Wenger 1998). Engagement is looser, but there are opportunities for casual participation and an inwards trajectory. An

example of peripherality is an apprentice, who at first observes the norms of the new workplace and gradually becomes an established member. There is only some engagement in the dimensions of participation; the apprentice would not be fully involved in the doing yet, would not necessarily feel a sense of belonging yet, might only be beginning to construct their identity around this community, and might not interpret their experiences of the world through their membership of this community yet.

Lastly, marginal members are kept at the edge of a community of practice and are not allowed to participate (Wenger 1998), for example a member of the accounting department within a company interacting with the catering staff, but not moving inwards into the catering community. The accountant would not do the work of the catering staff, would not feel a sense of belonging to this community, would not construct who they are around this community, and would not interpret their experiences through the framework of being a caterer. However, there is room for manoeuvre, as levels of participation are constantly in flux. At first glance, peripherality and marginality in Fig. 9.1 appear to be very similar, but it is the direction of their trajectory with the community of practice that is of importance, with peripheral members moving inwards and marginal members being pushed away from the core.

The theoretical concepts around participation help to understand the fluidity of inwards and outwards movements by virtual workers in the work community. At first glance, it might seem odd to analyse levels of participation in the context of virtual work, where there is no physical community and no mutual engagement in the sense of seeing each other every day and interacting. And yet, I propose that the application of communities of practice to virtual work extends this theoretical framework by re-conceptualising how 'mutual engagement, joint enterprise and shared repertoires' are negotiated via technology alone. Applying levels of participation to virtual work also helps to make sense of the relational space that surrounds the employment relationship in this setting. Overall, then, conceptually the relationship between virtual worker and organisation is theorised as a community of practice, while empirically this community of practice is studied at the level of the employing organisation. This chapter analyses the community of practice through the virtual worker's narrative and explores how the worker constructs her own position in the community,

how she describes her relationship with her manager, colleagues, and the organisation as a whole, and how she uses the informational space provided by technology to create a community in relational space.

Methodology—What Does Lisa Offer as a Case?

The in-depth analysis of a single case of a virtual worker provides insight into how placelessness is experienced, what the consequences of placelessness are at a micro-level and how a virtual worker negotiates strategies to deal with these consequences. The questions about the key issues at stake were only formed after the case was documented (Buchanan 2012), as the interview with virtual worker Lisa formed part of a larger study about boundary negotiations between work and home for workers who were physically absent from the organisation. However, Lisa's unique situation of being completely mobile in terms of places, countries, and the physical set-up of her work, raised interest in exploring her narrative in depth, and it was therefore decided to investigate Lisa as a single case in this chapter (Stake 2005; Flyvberg 2006; Siggelkow 2007). The selection of Lisa's case follows notions of theoretical sampling and of wanting to focus attention on a case where the 'experience of the phenomena under investigation is intense and visible' (Buchanan 2012: 361).

Lisa is Italian, female, in her 30s, and lives in Ireland. She is single, does not have children and shares an apartment with two other professionals. Her personal circumstances are likely to shape her ability to move between countries. Lisa works as a web content editor for a web marketing company that is headquartered in the United Kingdom and has offices in India. The company owns a large number of web domains and the nature of Lisa's work requires her to create, upload and translate content on the company's websites. Lisa initially started with the company on a casual basis as a freelancer while living in Italy. She then took this work with her to India and eventually Ireland. Ten months after starting to work for the organisation, Lisa secured a formal contract for full-time work with this organisation. More on Lisa's journey into this job is discussed in the findings section.

Of course, personal circumstances shape experiences of virtual work and Lisa's experience is not representative of all virtual workers. However, the issues her case raises, such as invisibility and struggles to establish trust are likely to be of relevance to many more virtual workers. I was introduced to Lisa through a mutual acquaintance, and interviewed her for two hours. The topics that guided the semi-structured interview include the context of her work, the content of it, working habits and routines (where, when, how, etc.), relationships with colleagues and supervisors, and questions around the technology that facilitates her work. The aim behind using a loose interviewing guide was to allow Lisa to steer the conversation and raise the issues that were most important to her (Smith 1995; Willig 2008), before probing for more detail.

The interview was analysed through a discourse analytic perspective, where language is viewed as having the power to construct and frame people's experiences (Burman and Parker 1993; Burr 1995; Potter and Wetherell 1987; Willig 2008). The analytic process was adapted from the six-stage discourse analysis proposed by Willig (2008) and tailored to suit the research objectives.

In step 1 ('discursive constructions'), I identified all references to the discursive object (i.e. generating trust in the face of placelessness). In step 2 ('discourses'), I located the construction of the research interest in wider discourses, for example discourses of the ideal worker, discourses of freedom and autonomy in freelancing, and so on. Step 3 ('action orientation') allowed me to delve into the purposes the various constructions achieve, for example at one point in her narrative Lisa talks about wanting to stay with the company and seeing their potential for growth. In doing so, the action she is performing is committing to the organisation. Step 4 ('positionings') is based on the notion of a subject position (Davies and Harré 1990) offered by the different constructions. According to Davies and Harré (1990), each discourse makes available subject positions for individuals within a conversation. As a conversation (or a text, an e-mail, an instant message) is produced, participants in the conversation create positions for themselves and others and take these up fluidly or reject them throughout the conversation. Adopting this view, the virtual worker cannot be seen as occupying a fixed role. Instead, the notion of subject positions means that the relationship between virtual worker and organisation is treated

as a fluid, ongoing negotiation and as emergent in each interaction. This analytic step is also particularly useful in applying the theoretical concepts of core, peripheral and marginal participation in communities of practice, as Lisa's construction of her own subject position gives insight into how she positions herself in relation to her organisation, to her manager and to co-workers. Step 5 ('practice') was intended by Willig (2008) to examine the possibilities for action that are opened up and closed down by discursive constructions and their subject positions. However, given the focus on relational space in this research, the step 'practice' was changed into 'communities of practice', to allow examination of which communities (if any) Lisa constructed in her narrative, using the criteria of mutual engagement, joint enterprise and shared repertoires (Wenger 1998). Step 6 ('subjectivity') attempts to express what can be felt, thought, and experienced from within a subject position. The idea here is that once we take up a subject position, we experience the world through this position. The next section presents the findings generated through the analysis.

Findings: Places, Placelessness and Coping Strategies

The insights from Lisa's case are presented here as follows. Firstly, I discuss the movement across places in the course of Lisa's work. Secondly, I present the consequences of Lisa's placelessness, including precarity and invisibility. Lastly, the coping strategies she uses in order to generate trust in the face of placelessness and invisibility are explored.

The Places of Lisa's Virtual Work

At the time of the interview, Lisa had been working as a web content editor for a web marketing company for six months full-time and before that another six months casually, and initially part-time as a freelancer. The company's headquarters are in London, while the largest number of staff are working in Chennai, India. Lisa originally started working for the company because she had been looking for a career move away from

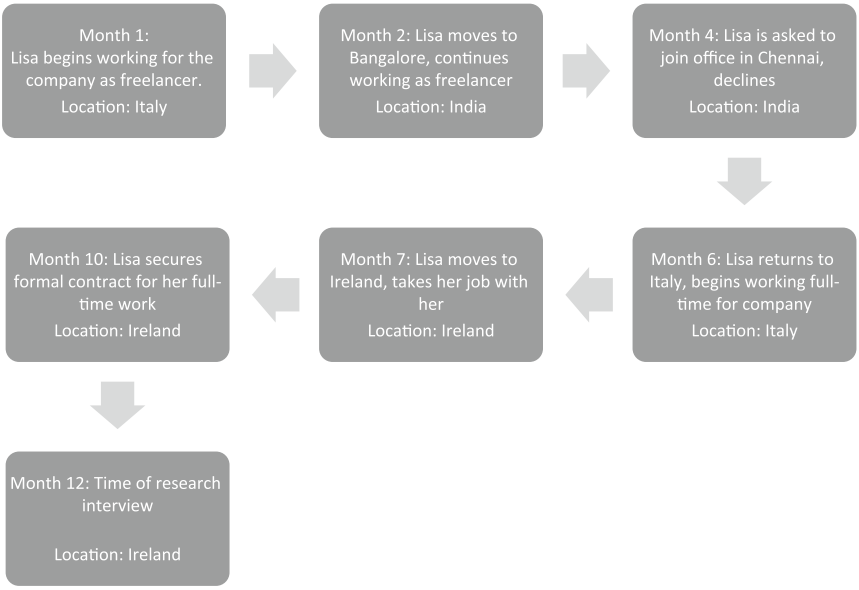

Fig. 9.2 Times and places of Lisa's virtual work journey

her career as a psychologist. She started as a freelance translator for a few hours per week while living in her home country, Italy. She then moved to Bangalore, India, for personal reasons and continued working for the company. She was asked to join the company's office in Chennai, but she declined, because she had settled into Bangalore. She later decided to move back to Europe, and was asked to work for the company full-time as a web content editor. She took the job back to Italy with her first, and then moved to Ireland. The interview took place a few months after having moved to Ireland. The timeline below gives an overview of when Lisa's moves between countries took place and sets out the stages in her journey with this company.

Lisa's story of virtual work spans the places of her home country Italy, India, Ireland, and implicitly the United Kingdom as the location of the company's headquarters. This fluidity of moving between countries (places) is representational of the nature of her work. While she physically moves between countries, her work remains the same in its content and can easily be taken with her from one country to the next. Her work would therefore seem not to be tied to any particular physical place, as she says:

> From where I work, it doesn't matter. And actually, they knew from the beginning, because when they hired me the first time, they were in London and I was in Italy, so it was ok. And I moved to India and I kept the job, so they knew that I was travelling.

This is interesting as one would expect that moving between countries might make a difference to work, for example, in terms of social support available to Lisa, or practical matters such as the availability of appropriate connectivity. There is also a contradiction in her statement that it does not matter from where she works, as evidenced by her declining the offer to move to Chennai because she had settled into Bangalore and thus had formed an attachment to place. However, it could be that for Lisa, attachment to place is about where she lives and socialises, while her work life is conducted in a virtual space in which location is inconsequential. Indeed, her moves were all motivated either by a desire to experience something new, to get away from family, or to come back to family, but never by work drivers. Comparing her patterns against the suggestion that workers are deeply attached to places, while capital occupies a more fluid space (Beynon and Hudson 1993), it seems that Lisa is somewhat attached to different places in her personal life, but her work is characterised by being carried out in informational space, that is in a 'non-place' (Visconti et al. 2010). Of course, her patterns could be a personal preference, but they could also be facilitated by the nature of her virtual work, which is inherently mobile and not tied to location.

Indeed, the relational space in which Lisa's work is negotiated is mediated by a number of technologies, as opposed to physical offices, buildings, or cities. For example, Lisa and her boss occupy an instant messaging space in order to create a co-presence which is symbiotic in nature (more on this later). They rely on Skype for messages and calls, e-mail, and the company intranet for information sharing. All of these technologies are navigated via her personal laptop, which facilitates her mobility and transience in terms of space. Even within her own apartment, Lisa sets up her laptop in the morning and packs it away again at night without leaving traces of her work:

> I don't have anything, I mean I just have my laptop. Yeah I have a few notes, sometimes I write things down, if I need to remember something. I have some reminders, but mainly what I need is my laptop and that's it. I don't need

> anything else, so I keep it in my room and then in the morning, when I go downstairs to have my breakfast, I have my laptop and that's all I need. My work doesn't require any other things […] I can work from any place […] for example, Sunday I'm going back home, so I can travel on Sunday and Monday I can be online again, but I will be in my Mum's kitchen instead of this kitchen. […] I can work from the sofa, the armchair, my bed, whatever.

Lisa's transience and ability to work from any place is in line with Agnew's (2011) contention that new technologies make places obsolete. This transience is a double-edged sword—Lisa constructs it as positive in allowing her flexibility in how and where she conducts her work, and as negative in rendering her invisible to her company and as having to prove her worth more than a worker who is physically present. Next, the consequences of Lisa's placelessness are discussed in more detail.

Consequences of Placelessness: Precarity and Invisibility

While the technologies Lisa uses to conduct her work may make places obsolete (Agnew 2011), she still operates in relational spaces within her organisation. Lisa must still work with others and figure out her position in the organisation. Here it can be witnessed that the placelessness of Lisa's work can be experienced as a sense of isolation and a lack of belonging:

> I think that the best thing is to get the chance to work from home and then from time to time to go back to the office […]. That really ties you to the job. And you feel part of something. Well, my case is something different. See I've never met anybody else in my company other than my boss for two days. But that is because the company is very small and whatever. […] There is this possibility to feel very cut out, very alone…you know, lonely. There is this chance to be alone.

Her lack of belonging is also impacted by an invisibility between her and the organisation. She is not seen while conducting her work, and on the other side of the relationship, she is kept in the dark about the company's overall situation.

> I just met one of the bosses, the Italian boss, who is one of the owners. Yeah, only him (laughter) my company's invisible.

This also means that she is unclear about who else works for the company and what other people do. When I asked her whether there were other staff working virtually for the company she answered:

> I don't know … maybe there is a girl, but I'm not really sure, in Madrid, taking care of Spain […] I'm not very clear about the company's situation.

There is a sense of anonymity running through Lisa's account, which characterises her own positioning within the organisation and highlights that her virtual work does indeed occupy space as non-place (Visconti et al. 2010), as opposed to a meaningful place which would be associated with 'social interactions, sense of belonging, collective memories, and shared identities' (Visconti et al. 2010: 513).

It appears that while places are not necessary to conduct the content of this type of work, they continue to serve important functions in bringing workers together and socially tying workers to their organisation. Thus places may become obsolete in virtual work, but they have not been replaced with an appropriate alternative that remedies the limbo Lisa experiences in terms of where she belongs. What Lisa seems to be certain of is that she does not belong to the core (Wenger 1998) of her company, as she is treated differently from staff in the bigger offices, for example she recalls a situation in which on-site staff were given training and she felt left out:

> Now we have a new let's say procedures, a new work process. But all the people in India got a training double day. For me it was just like, "This is the intranet and this is the checklist" … ahm, "Thank you". You know? In that situation it would have been nice to go to the office, share with other people which are the features and what I'm supposed to do and then go back home and do my part.

It appears that Lisa would like to feel part of her organisation, but her status as a virtual worker prevents this. When this dynamic is analysed through Wenger's (1998) concept of 'levels of participation', it appears

that there is no possibility for Lisa to move in towards the core of the community of practice in her organisation. If she had accepted the offer to work from the office in Chennai, maybe she would be on a trajectory towards core participation. However, as a virtual worker she is constructed as peripheral, and possibly even a marginal member of this community, who cannot experience the mutual engagement, shared aims, and shared repertoires that physical co-presence offers.

Related to Lisa's position at the edges of the organisation is uncertainty over her status in the company. It is not clear to her whether she is considered a freelancer or a full-time employee. Lisa started working for her company on a freelance basis. While she now works full-time and has secured an employment contract, her status could at best be called 'precarious'. This is how she describes the journey towards securing a contract:

> It was a kind of freelance job with no contract. Ok, so I was just working for them and they were paying me. So we didn't have any paper, nothing […]. Now I got a contract, after a long fight, so at least they can't fire me, I mean overnight. […] But the salary is a big issue. It's a joke because I don't have paid holidays, I don't have any health insurance, I don't have anything. So it's just the salary, and that's it. So with that salary, I have to manage everything and if I take one day off, I don't get any money.

Related to her precarious contract are the issues of working when sick, not taking time off and working overly hard:

> I never took a day off when I was sick or I was feeling bad. That is a problem […]. But yeah, in a way you feel, yeah you feel guilty. It's like, ok, whatever, even if you have fever, you can still type on your keyboard […] Maybe I'm over-disciplined, it's like I'm over-concerned about what's going on, but yeah I mean, it's very easy, you don't work, you don't get paid. That's it. Which is a freelance job. That's what it is.

> [I have] one hour of [a lunch] break, which is never a break because the boss is online. So I'm eating with one hand and with the other hand I'm typing.

Of course, precarious work conditions are not unique to virtual work (see e.g. Potter and Hamilton 2014), but in Lisa's case the combination of a precarious contractual situation and being physically absent from the organisation leads to her having to work hard to prove her worth. The next section describes how she attempts to create trust in order to legitimise her work in the context of placelessness, precarity and invisibility.

Creating a Sense of Trust: Coping Strategies

As Lisa's virtual work is invisible, removed from particular places and nobody witnesses what she does on a daily basis, issues of trust—in the sense of reliability and predictability (Grey and Garsten 2001)—between organisation and worker are brought to the fore. Lisa highlights this by pondering whether anyone would even know if she outsourced her job:

> How can this guy know that I'm doing the job? He doesn't know actually. I mean, he actually gives me some task and then, ok, I could also give part of my work to somebody else. Get the job done, put it online or whatever, send an e-mail just to show that I've done the job and nobody knows.

Knowing that Lisa could pay somebody else to do her job demonstrates that she is replaceable and that it is not she as a person who is needed by the company, but her output. In this context, Lisa uses three strategies to generate the trust of her boss and the organisation: (a) proving her hard work, (b) bargaining for trust and (c) working in symbiosis.

Lisa proves her worth and that she is hard-working by overworking to deliver projects, even in the face of unrealistic deadlines:

> I spent my whole weekend working full Saturday, working full Sunday, to be ready on Monday. Ah because I was given the task on Friday, to be done on Monday, ok. […] But nobody could see that I needed to work one full weekend to get that thing done. This was very frustrating, ok, and I didn't get paid for that […] I get paid for what they ask me, not for how long it took to be done.

Lisa explains that there is much more of a focus on output when working away from an organisation, as the process behind delivering results is invisible:

> We argued about how long does it take to translate because when you are in an office, everybody can see that you are sitting and working, ok. So you actually don't need to prove that that task was very tough and it took longer than what was expected. When you are at home, nobody sees, so you actually have to demonstrate that that thing was special or difficult. And, how long does it take to get that job done in the way the boss likes it? Ahm, in a way it's very frustrating because what the boss can see is only the result. He can't see the process.

Again, this could be an issue of Lisa's work happening in a virtual space, as opposed to a physical place, which would root her in social practices that come with social support (Merrifield 1993). However, by delivering outputs even under difficult circumstances, Lisa is able to assimilate some form of trust based on a transactional relationship (Grey and Garsten 2001). This is further exemplified by her strategy of bargaining for trust.

> You have to work on another side to gain trust. So, now what I do is making him feel that I know what he wants and I do exactly what he wants. So he can trust me. So, for example, this week he gave me a new task and he was expecting me to do that task in a certain time. I was much quicker. So he had to run after me, cos I was quicker than him. […] Then I think in that way I can ask him for other things. Which happened with the contract. That was a long fight, but I think that based was on the trust I built, I was able to get my conditions and not their conditions.

> When you realise you are able to go beyond his expectation, then you win one point. And then you can use that 'voucher', you can spend it in another situation. But it's…yeah you feel tense every day and every day is based on just performance. Ah, the point is, you're making yourself necessary. Without me, you are in trouble. So it's like I'm overworking in a way, just to be able to, you know, bargain. […] So, but you have to earn points to spend. This is not something that happens in an office, you're not so pushed on performance. There's nobody sitting on your head, 'Do this, do that, do this, do that'.

Here she shows that trust is carefully negotiated in every interaction in which she can meet or exceed expectations, which reflects Grey and Garsten's (2001) understanding of trust as fragile and requiring constant re-affirming. The relationship that is established here is one based on bargaining: when Lisa works hard and 'earns points', she will 'use that voucher' in later interactions with her boss. This kind of language hints at a transactional employment relationship and might raise the question of whether it is possible to conceptualise this employment relationship as a community of practice (Wenger 1998) at all. However, bargaining is a form of mutual engagement, which does not have to be harmonious to create a community. Instead, conflict can be a mode of interaction in a community. Further, despite their transactional employment relationship, a symbiotic quality develops in the relationship between Lisa and her boss, which is another avenue through which she generates trust.

> What I do requires a lot of interaction with my boss. So we actually communicate through Skype. So I'm online when he's online. And now it's going to be tough because he's in India, he's five hours ahead. So at least we match for a part of the day. He expects me to be online during the day because we need to interact.

> I also like to be online when the boss is online, cos it's my only, you know, window on the wall.

> He is actually the only person I talk to during the day and I don't talk, I just chat [on messenger]. So, I've met him only once in my life and for two days. Yeah, so we chat a lot during the day—I can't eat cos he uses me like a post-it, because he's very busy and overloaded, so he tells me things that I've to remind him of.

Despite their geographic distance and despite having met in person only once, a relationship of dependence has developed between Lisa and her boss. The statement 'he uses me like a post-it' positions Lisa as his assistant (which is not meant to be the nature of her job) and suggests that she is needed, which contrasts with earlier quotes about being replaceable. Here we can witness shared routines and repertoires

being developed, which indicates the presence of a community of practice (Wenger 1998). Similarly, her description of her boss being her only 'window on the wall' implies that she relies on him for sustaining positive workplace connections. The relationship that emerges tells us that virtual workers can and do create connections to their organisations and participate in a community of practice, though these communities are different from those established through physical proximity. In the discussion, I will return to the unique qualities of the community of practice being developed by virtual workers.

Discussion and Conclusion

This chapter has shown that virtual work is removed from clearly defined places and instead is negotiated in an informational-relational space. While interaction in informational spaces has led to a community of practice between Lisa and her employing organisation, in which the mode of engagement is transactional and based on bargaining, questions remain over whether the quality of relationships created is sufficient for a sustainable, long-term working environment. It does appear as though the symbiotic relationship facilitated by instant messenger, Skype, and e-mail does indeed take on a quality of dependence, which would suggest it is possible to create relational spaces in the absence of place. However, the lack of place is an issue for Lisa at times, for example when core site workers received training and she felt left out, indicating that some interactions rooted in physical places imbued with sense of belonging and collective identities (Visconti et al. 2010) would be desirable. It can therefore be suggested that space is conquering place, but only goes some way in creating work communities. For experiences of learning, identification and belonging, physical place remains a necessity.

Of course, Lisa's experience is not representative of all virtual work, and indeed it is possible to imagine that other virtual workers mix mobile work with on-site work, which could fulfil the requirement for place and a sense of belonging. Lisa's case is extreme in the mutual invisibility between her and her organisation, coupled with her mobility in living

arrangements. Therefore, while we can conclude that Lisa's virtual work is placeless and occupies informational-relational spaces, this may not be the case for all virtual work. Lisa's mobility contradicts previous suggestions by Beynon and Hudson (1993) that capital is mobile, while workers are tied to spaces. Lisa's case is different: the company she works for operates in set locations, while she is somewhat attached to places in her personal life but fluidly brings her work with her wherever she travels.

Further, moving from placelessness to the associated invisibility and precarity experienced by Lisa, it can be suggested that invisibility for Lisa is doubly difficult: not only is she invisible to the organisation, but she also reports a sense of her organisation being invisible to her, a sense of not knowing or understanding what is going on in the company, and who else works for the organisation. Connecting this with the notion of space, it is reminiscent of Visconti et al.'s (2010) suggestion that space is anonymous, which seems to be a recurring theme for Lisa's employment.

Lisa's employment, despite having been formalised through a contract, is similar to a freelancing scenario. Thus her anxiousness to stay connected to her boss, prove her hard work and bargain for trust could be rooted in the income insecurity and prioritisation of work reported by Gold and Mustafa (2013) in relation to home-based self-employed professionals. The invisibility and anonymity described by Lisa in her employment relationship also shares parallels with the Mechanical Turkers in Bergvall-Kåreborn and Howcroft's (2014) research and the 'fleeting relationships' (Bergvall-Kåreborn and Howcroft 2014: 215) they experience, despite the fact that Lisa's contract is more formal. For the Mechanical Turkers, 'management control is simultaneously "at a distance" while remaining all powerful when directing work tasks and determining the nature of reward' (ibid.)—this is similar to Lisa having to prove her hard work and overworking at the weekend in order to complete the task set to her. While Lisa's relationship with the company is more formal and ongoing than those witnessed in Mechanical Turk, the potential for anonymous and fleeting relationships is very similar.

This raises the question of whether virtual work is by its nature precarious, or whether it is possible to imagine that other types of virtual work are secure? While it is not possible to generalise, it can be suggested that in Lisa's case, her virtual work is made precarious by a combination of factors: by having started out as a freelancer (thus starting out in a position

of low power) and securing a more formalised contract only through a protracted negotiation; by being invisible and choosing to work at a distance even when offered a base at the office in Chennai (cutting off the possibility for an inwards trajectory to the core of the organisation); by offering work that is relatively low skilled (translation and editing) and being easily replaceable, as she explains that it would not be noticed if her work was conducted by another person; and lastly by a lack of worker solidarity as Lisa has not ever met any of her co-workers. The only person she has ever met is her boss who she depends on. In short, from Lisa's case it is impossible to state that it is virtual work per se that has made her precarious, and therefore it is entirely plausible that other types of virtual work (e.g. consultancy) would attract a stronger bargaining position.

The suggestion that management control is powerful yet distant (Bergvall-Kåreborn and Howcroft 2014) raises questions over how Lisa and her boss navigate power. Their organisation can be conceptualised as a soft bureaucracy (Courpasson 2000) in which power is not expressed through explicit punishment, but through strategies such as requiring Lisa to be online at the same time as her boss so she can be 'used like a post-it'. However, as the analysis has shown, Lisa is not powerless and crafts strategies to bargain for trust which allows her to demand better working conditions. Their relationship can thus be described as a power game (Crozier 1964), in which both Lisa and her boss exploit uncertainties and create rules in their interest. Lisa plays with making her boss dependent on her (completing tasks before he expects them to be done, making him feel that she knows what he wants) in order to increase his costs to replace her and make it less likely that she will lose her job. Lisa's boss plays with keeping Lisa away from the rest of the organisation (he is the only familiar face she deals with), which makes her vulnerable and isolated, as she cannot escalate conflict to a different hierarchical level or widen their power game.

Delving into Lisa's strategies to win trust in more detail, these can be summarised as firstly proving her worth by overworking, secondly winning points with the organisation that she uses to bargain for better conditions, and thirdly developing a symbiotic relationship with her boss. All three strategies can be conceptualised as power games (Crozier 1964). The first strategy confirms previous literature on legitimacy issues

in mobile work (e.g. Halford 2005; Mirchandani 1998a, b, Brocklehurst 2001; Tietze and Musson 2005), and confirms that physical absence contributes to illegitimacy. The second strategy, bargaining for trust, portrays the employment relationship as transactional in nature. The notion of having to 'win points' creates a sense of a pressurised work environment and experiences of work intensification (Kelliher and Anderson 2010). The third strategy, working in symbiosis, shows that it is possible to create mutual engagement, though this does not mean that both parties are equally invested in the interaction. Lisa talks about her boss as 'her only window on the wall' and herself as a 'post-it' for him, which positions her as a relatively powerless recipient of interaction, and him as powerful. Mutual engagement also does not mean that it has to be a harmonious relationship. Indeed, mutual engagement includes the negotiation of Lisa's contract, which was characterised by conflict.

Given that Lisa is positioned as the recipient of interactions, from a critical perspective it is important to ask to what extent Lisa has autonomy over these connections with her boss (Mazmanian et al. 2013; Cavazotte et al. 2014; Leonardi et al. 2010). Indeed, the fact that Lisa talks about never having a lunch break because she is typing to remain connected with her boss indicates that this virtual worker lacks choice over remaining connected, which can be viewed as an expression of her precarious position (Siebert and Wilson 2013; Standing 2011). It could also be speculated that the isolation experienced in virtual work (Kolb et al. 2012; Mann and Holdsworth 2003) makes it more likely that constant connectivity and availability will be tolerated or even welcomed by a virtual worker in order to feel a sense of belonging.

Overall, one could ask whether Lisa's strategies to secure trust were successful. I would suggest that there has been some success in the sense that Lisa's working conditions have improved as she has 'earned points to spend'. Were it not for having proved her hard work, bargaining, and establishing co-presence and symbiosis with her boss, it is unlikely that she would have secured a formalised contract (which she says the company did not want to provide her with). But, in securing trust, and being a predictable and reliable worker, it can be argued that Lisa is subjected to greater control: 'Trust is a form of power [which] is productive of certain forms of (predictable) behaviour' (Grey and Garsten 2001: 232f.). Therefore, Lisa's

strategies to generate trust have been successful in the sense of her being treated somewhat better than a casual freelancer. However, Lisa continues to be in a position which is far from what would be termed secure employment, as she continues to be paid on a task basis and still does not receive holiday or sick pay, yet she is expected to deliver the same consistent work output that has made her 'trustworthy'.

Despite this relatively powerless and precarious position, it becomes evident that Lisa has developed a community of practice with the employing organisation (Wenger 1998) which is based on transactional, mutual engagement. As such, the chapter exemplifies the ambiguous relationships of trust despite distance. It is also clear that the relationship with her boss has developed into its own community of practice through regular mutual engagement, symbiotic co-working, shared aims of completing a task, and shared routines and rituals of how they get things done. Lisa can thus be conceptualised as a peripheral member in a community of practice, that is she casually engages with the practice, but is not situated at the core of the organisation. This view of a community of practice is directly at odds with Grugulis and Stoyanova (2011: 343) who suggest that outsourcing, 'at will' contracts and freelance work are much less effective at supporting communities of practice than stable work groups or vertically integrated bureaucracies'. I would argue that communities of practice in virtual work take on a different quality, and are not 'coherent communities, containers of competence' (Grugulis and Stoyanova 2011: 342). Instead, they are communities that are mediated by technology, which moves people inwards into the core of a practice and outwards towards the margins: Firstly, technology serves as the vehicle through which a sense of co-presence can be established with a boss or a co-worker and is thus an enabling mechanism that contributes to a position within the organisation. Secondly, and paradoxically, technology reminds the virtual worker that it is the *only* means open to a relationship and is therefore also an object that keeps the virtual worker away from core membership of the organisation.

The contribution of the chapter has firstly been to re-think what a community of practice is in the context of new forms of work, such as virtual work. Virtual work can facilitate the development of a community of practice; however this community is navigated via *informational-relational space*,

rather than in a physical place. Thus Wenger's (1998) 'communities of practices' has been merged with debates around place/space (Agnew 2011; Visconti et al. 2010; Ellem and Shields 1999; Beynon and Hudson 1993; Massey 1984; Merrifield 1993).

This chapter secondly helps us to re-think the virtual worker and moves away from virtual workers as 'lonely riders' (Koroma et al. 2014) with a fixed position outside an organisation. Instead, the virtual worker in this chapter is constantly re-positioned through every interaction. At times, by having earned points to spend, the worker's position becomes more powerful, other times it becomes more powerless. This leads to placelessness, invisibility and precarity not being absolute states, but positions in flux, particularly when they are understood as instances of power games (Crozier 1964). This view of virtual worker and supervisor/organisation playing games with each other is highly relevant for the analysis of virtual work and is integrated usefully with communities of practice (Wenger 1998), as participation in the community of the employing organisation is a power game of moving inwards and outwards, and happens through everyday interactions and negotiations mediated via technology.

References

Agnew, J. (2011). Space and place. In J. Agnew & D. Livingstone (Eds.), *Handbook of geographical knowledge* (pp. 316–330). London: Sage.

Bergvall-Kåreborn, B., & Howcroft, D. (2014). Amazon mechanical turk and the commodification of labour. *New Technology, Work and Employment, 29*, 213–223.

Beynon, H., & Hudson, R. (1993). Place and space in contemporary Europe: Some lessons and reflections. *Antipode, 25*, 177–190.

Brocklehurst, M. (2001). Power, identity and new technology homework: Implications for'new forms' of organizing. *Organization Studies, 22*, 445–466.

Buchanan, D. A. (2012). Case studies in organizational research. In G. Symon & C. Cassell (Eds.), *Qualitative organizational research* (pp. 351–370). London: Sage.

Burman, E., & Parker, I. (1993). *Discourse analytic research*. London: Routledge.

Burr, V. (1995). *An introduction to social constructionism*. London: Routledge.

Cavazotte, F., Lemos, A. H., & Villadsen, K. (2014). Corporate smart phones: Professionals' conscious engagement in escalating work connectivity. *New Technology, Work and Employment, 29*, 72–87.

Collins, M. (2005). The (not so simple) case for teleworking: A study at Lloyd's of London. *New Technology, Work and Employment, 20*, 115–132.

Courpasson, D. (2000). Managerial strategies of domination. Power in soft bureaucracies. *Organization Studies, 21*, 141–161.

Crozier, M. (1964). *The bureaucratic phenomenon*. Chicago: University of Chicago Press.

Davies, B., & Harré, R. (1990). Positioning: The discursive production of selves. *Journal for the Theory of Social Behaviour, 20*, 43–63.

Derks, D., van Mierlo, H., & Schmitz, E. B. (2014). A diary study on work-related smartphone use, psychological detachment and exhaustion: Examining the role of the perceived segmentation norm. *Journal of Occupational Health Psychology, 19*, 74–84.

Ellem, B., & Shields, J. (1999). Rethinking 'regional industrial relations': Space, place and the social relations of work. *Journal of Industrial Relations, 41*, 536–560.

Felstead, A., Jewson, N., & Walters, S. (2005). *Changing places of work*. Hampshire: Palgrave Macmillan.

Flyvberg, B. (2006). Five misunderstanding about case-study research. *Qualitative Inquiry, 12*, 219–245.

Gold, M., & Mustafa, M. (2013). Work always wins: Client colonisation, time management and the anxieties of connected freelancers. *New Technology, Work and Employment, 28*, 197–211.

Greenhill, A., & Wilson, M. (2006). Heaven or hell? Telework, flexibility and family in the e-society: A marxist analysis. *European Journal of Information Systems, 15*, 379–388.

Grey, C., & Garsten, C. (2001). Trust, control and post-bureaucracy. *Organization Studies, 22*, 229–250.

Grugulis, I., & Stoyanova, D. (2011). The missing middle: Communities of practice in a freelance labour market. *Work, Employment and Society, 25*, 342–351.

Haddon, L., & Lewis, A. (1994). The experience of teleworking: An annotated review. *The International Journal of Human Resource Management, 5*, 193–223.

Halford, S. (2005). Hybrid workspace: Re-spatialisation of work, organisation and management. *New Technology, Work and Employment, 20*, 19–33.

Hilbrecht, M., Shaw, S. M., Johnson, L. C., & Andrey, J. (2008). 'I'm home for the kids': Contradictory implications for work-life balance of teleworking mothers. *Gender, Work & Organization, 15*, 454–476.

Hislop, D., & Axtell, C. (2007). The neglect of spatial mobility in contemporary studies of work: The case of telework. *New Technology, Work and Employment, 22*, 34–51.

Hislop, D., Bosch-Sijtsema, P., & Zimmermann, A. (2013). Introduction for special themed section: Information and communication technology and the work-life boundary. *New Technology, Work and Employment, 28*, 177–178.

Kelliher, C., & Anderson, D. (2010). Doing more with less? Flexible working practices and the intensification of work. *Human Relations, 63*, 83–106.

Kolb, D. G., Caza, A., & Collins, P. D. (2012). States of connectivity: New questions and new directions. *Organization Studies, 33*, 267–273.

Koroma, J., Hyrkkänen, U., & Vartiainen, M. (2014). Looking for people, places and connections: Hindrances when working in multiple locations: A review. *New Technology, Work and Employment, 29*, 139–159.

Kurland, N. B., & Bailey, D. E. (1999). When workers are here, there, and everywhere: A discussion of the advantages and challenges of telework. *Organizational Dynamics, 28*, 53–68.

Leonardi, P. M., Treem, J. W., & Jackson, M. H. (2010). The connectivity paradox: Using technology to both decrease and increase perceptions of distance in distributed work arrangements. *Journal of Applied Communication Research, 38*, 85–105.

MacCormick, J. S., Dery, K., & Kolb, D. G. (2012). Engaged or just connected? Smartphones and employee engagement. *Organizational Dynamics, 41*, 194–201.

Mann, S., & Holdsworth, L. (2003). The psychological impact of teleworking: Stress, emotions and health. *New Technology, Work and Employment, 18*, 196–211.

Massey, D. (1984). *Spatial divisions of labour*. London: Macmillan.

Matusik, S. F., & Mickel, A. E. (2011). Embracing or embattled by converged mobile devices? Users' experience with a contemporary connectivity technology. *Human Relations, 64*, 1001–1030.

Mazmanian, M., Orlikowski, W. J., & Yates, J. (2013). The autonomy paradox: The implications of mobile email devices for knowledge professionals. *Organization Science, 24*, 1337–1357.

Merrifield, A. (1993). Place and space: A lefebvrian reconciliation. *Transactions of the Institute of British Geographers, 18*, 516–531.

Mirchandani, K. (2000). 'The best of both worlds' and 'cutting my own throat': Contradictory images of home-based work. *Qualitative Sociology, 23*, 159–182.

Mirchandani, K. (1998a). Protecting the boundary: Teleworker insights on the expansive concept of 'work'. *Gender & Society, 12*, 168–187.

Mirchandani, K. (1998b). No longer a struggle? Teleworkers' reconstruction of the work-non-work boundary. In P. J. Jackson & J. M. Van der Wielen (Eds.), *Teleworking: International perspectives—From telecommuting to the virtual organisation* (pp. 118–135). London: Routledge.

Orlikowski, W. J. (2007). Sociomaterial practices: exploring technology at work. *Organization Studies, 28*, 1435–1448.

Porter, G., & Kakabadse, N. K. (2006). HRM perspectives on addiction to technology and work. *Journal of Management Development, 25*, 535–560.

Potter, J., & Wetherell, M. (1987). *Discourse and social psychology—Beyond attitudes and behaviour*. London: Sage.

Potter, M., & Hamilton, J. (2014). Picking on vulnerable migrants: Precarity and the mushroom industry in Northern Ireland. *Work, Employment and Society, 28*, 390–406.

Russell, H., O'Connell, P. J., & McGinnity, F. (2009). The impact of flexible working arrangements on work-life conflict and work pressure in Ireland. *Gender, Work and Organization, 16*, 73–97.

Siebert, S., & Wilson, F. (2013). All work and no pay: Consequences of unpaid work in the creative industries. *Work, Employment and Society, 27*, 711–721.

Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal, 30*, 20–24.

Smith, J. A. (1995). Semi-structured interviewing and qualitative analysis. In J. A. Smith, R. Harré, & L. Van Langenhove (Eds.), *Rethinking methods in psychology* (pp. 9–26). London: Sage Publications.

Stake, R. E. (2005). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 443–466). Thousand Oaks, CA: Sage.

Standing, G. (2011). *The precariat: The dangerous new class*. London: Bloomsbury Academic.

Sullivan, C. (2000). Space and the intersection of work and family in home-working households. *Community, Work & Family, 3*, 185–204.

Tietze, S. (2002). When 'work' comes 'home': coping strategies of teleworkers and their families. *Journal of Business Ethics, 41*, 385–396.

Tietze, S., & Musson, G. (2005). Recasting the home–work relationship: A case of mutual adjustment. *Organization Studies, 26*, 1331–1352.

Vayre, E., & Pignault, A. (2014). A systemic approach to interpersonal relationships and activities among french teleworkers. *New Technology, Work and Employment, 29*, 177–192.

Visconti, L. M., Sherry Jr., J. F., Borghini, S., & Anderson, L. (2010). Street art, sweet art? Reclaiming the 'public' in public place. *Journal of Consumer Research, 37*, 511–529.

Wajcman, J., & Rose, E. (2011). Constant connectivity: Rethinking interruptions at work. *Organization Studies, 32*, 941–961.

Wenger, E. (1998). *Communities of practice. Learning, meaning, and identity*. New York: Cambridge University Press.

Willig, C. (2008). *Introducing qualitative research in psychology. Adventures in theory and method* (2nd ed.). Berkshire: Open University Press, McGraw Hill Education.

Wilson, J. M., O'Leary, M. B., Metiu, A., & Jett, Q. R. (2008). Perceived proximity in virtual work: Explaining the paradox of far-but-close. *Organization Studies, 29*, 979–1002.

10

Towards a Model of Collective Competences for Globally Distributed Collaborations

Thomas Ryser, Elisabeth Angerer, Mangadu Paramasivam Ganesh, and Hartmut Schulze

Introduction

Besides the tendency to further standardise and break down globally distributed work, for companies as well as for more informal organisations, the importance of distributed team collaboration can be seen as a constant in global work (cf. Gilson et al. 2015; Hinds et al. 2011). In the global team literature (Berg 2006; Janssens and Brett 2006; Maynard et al. 2012; Maznevski and Chudoba 2000) the requirements of tasks which have the goal of integrating different local perspectives was conceptualised as a defining characteristic. Globally distributed team collaboration, thus, involves the work on complex, interdependent group tasks across boundaries in regard to cultural heterogeneity, geographical distance and computer-mediated communication. According to Janssen and Brett (2006), in global distributed teams people involved in more creative and complex work are required to extract and share locally embedded knowledge to be able to integrate and finally implement that work in global products, processes, services or new organisational designs. Through the articulation of respective differences people involved in global team collaboration experience emotionally and cognitively laden situations,

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in which behavioural expectations are broken (cf. Burgoon and Hubbard 2005). Thus, working in virtual team settings engenders the experience of 'discontinuity in the performance of joint activities', which requires 'additional attention' and extra effort 'to manage the situation' (Watson-Manheim et al. 2012: 35). If no effort is taken 'to structure common sets of work practices', global teams working across boundaries will experience communication breakdowns (cf. Panteli and Fineman 2005).

Such disruptions in boundary-crossing activity systems can act as triggers for phases of expansive learning (Engeström 1992, 2001). According to Engeström (2004: 11), boundary-spanning creative and innovative work forms represent 'a twofold learning challenge'. First of all new work practices have to be established by respective structures, tools and artefacts across boundaries. Secondly, the work objective itself is re-negotiated between the producers, investors, and users of the services or products in their respective cultural contexts in ongoing process cycles. So-called epistemic practices should develop which diverge from routine social interactions as they focus on solving emergent problems containing a good deal of novelty. Innovation involves the development of a new set of practices 'through the cultivation of corresponding personal and collective competences' (Hakkarainen 2009: 215). Besides competences of articulation and translation of specific needs of globally dispersed communities (cf. Irani et al. 2010), it is also essential to be aware of and reflectively learn from interaction. In addition to the perspective on innovation which sees the dialectic tension between activities of exploration and exploitation at the heart of the innovation process (cf. Bledow et al. 2009; March 1991), in this exploratory research of future requirements for collective competences, the mediating artefacts are introduced as a trialogical instance in the process of developing the knowledge practices required to extract and integrate globally distributed knowledge bases (cf. Hakkarainen et al. 2011). According to Engeström et al. (2003) such new forms of innovation are enabled by the creation of objects, which expands time and space to create new intermediating practices.

Referring to the context of 'virtual work' or 'virtual teams', the relation of activities to concrete 'places' is very often neglected. The notion of place in Dourishs' (2006: 299) terms refers to 'the ways in which settings acquire recognisable and persistent social meaning in the courses of interaction'. A notion of place entrenches mediating tools and artefacts with cultural meanings which orient appropriate behaviours in specific contexts. Mediational artefacts serve as tools to articulate new knowledge practices in virtual work settings (cf. Hakkarainen 2009). The use of digital tools itself, thus provides constraints and opportunities for building continuities through practices of negotiating the shared work object and processes of collaboration. Collaboration in global work settings produces discontinuities, through a lack of shared cultural practices of interaction (cf. Hinds et al. 2011; Watson-Manheim et al. 2012). A virtual place, thus, has to be created through establishing practices which transcend the boundaries of globally distributed work. The positive impact of such practices could be observed in the self-organised, yet still locally embedded, online communities of the micro-workers by Lehdonvirta (see Chap. 4 of this book). Consequently, through collective activities aspects of produced 'placelessness' as identified by Flecker and Schönauer (see Chap. 2 of this book) in global service value chains might possibly be overcome.

Under the perspective developed in this contribution, collective expertise or competence develops by coping with discontinuities and differences by developing practices, which enable globally distributed teams to actively transcend differences in understanding. To outline such a perspective, a review on the sparse literature of required competences on the collective or team level, will be presented in the following paragraph. The insights help to develop a sensitising research framework for an explorative expert survey. The central, explorative research question focusses on the future requirements of competences for globally distributed co-creation on the discerned dimensions of collective competences. Finally, the preliminary model, which conceptualises global and virtual collaboration competences, will be discussed according to the results of the explorative survey.

Towards a Process Framework for Assessing Collective Competences

When comparing the various definitions used to come up with a concept of collective competences (see Fig. 10.1 for an overview of consulted literature), a broad differentiation between models can be drawn. Some models proclaim a more systemic view of competences serving to fulfil pre-set system goals or functions. On the other hand, there are approaches conceptualising competences more as a recursive way of structuring and organising through making sense of ambiguous events and innovation objectives.

In the German research community (Gröschke 2010; Kauffeld 2006; Krumm and Hertel 2013), as well as some of the Scandinavian literature (Kokko et al. 2007; Lönnblad and Vartiainen 2012; Ruuska and Teigland 2009), researchers were more inclined to define collective competences according to pre-set requirements and goals. Such theories are modelling

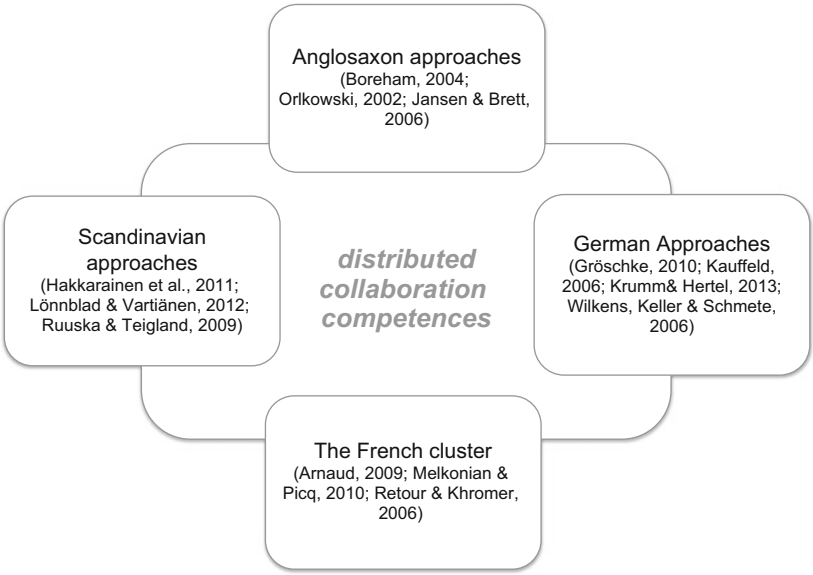

Fig. 10.1 Clusters in the literature on collective competences in dynamic environments

competences on a team level by defining structural (characteristics) and process related aspects (operative actions), which are required to fulfil system functions (Lönnblad and Vartiainen 2012). According to Kauffeld (2006) team competence emerges from individual level competences, but cannot be seen as isomorphic to them. The individual behaviours, attitudes and individual knowledge bases are changed through interaction and facilitate the emergence of collective group competence, enabling groups to act as social entities. In a similar vein, Ruuska and Teigland (2009) define collective competence 'as a group's ability to work together towards a common goal and results in creation of a collective outcome', which achieves the synergetic potential of the team.

On the level of a more enduring relational, as well as structural system, shared knowledge bases and mental models (Janssens and Brett 2006; Ryser et al. 2011), or more socio-emotional aspects such as team identity in the sense of a shared 'commitment and we spirit' (Kokko et al. 2007: 38), or innovation fostering, psychologically safe team climates (Anderson and West 1998; Edmondson and Lei 2014; Gibson and Gibbs 2006) form the constituting elements of team competences. Such structural characteristics contain the schemata and scripts for further group interaction (cf. Bolten 2008). Thus, in the explorative expert survey, collective competences for distributed innovation projects were explored by considering more stable, *established cognitive structures and characteristics of teams* as they serve as orientations for further interactions.

In contrast to those systemic approaches to define collective level competences, the French cluster (Arnaud 2009; Melkonian and Picq 2010; Retour and Khromer 2006) as well as considered proponents from the Anglo-Saxon literature (Boreham 2004; Orlikowski 2002), take a more recursive stance towards the development of collective competences in complex organisational settings. Orlikowski (2002) argues that key competences emerge from a team's activity. Contradictions within the work objective might emerge through different expectations held by different stakeholders or communities in the work process (cf. Boreham 2004). According to Paavola et al. (2012) mediation can be supported by the creation of artefacts, such as early prototypes which allow the creation of a shared understanding between the involved stakeholders. Such artefacts mediate between different understandings of innovation objectives,

for example by externalising early ideas, but might also act as means and orientation for coordination, by visualising project plans or maps (cf. Arnaud 2009). In the same vein, Boreham (2004) inspired by Engeström (1992) refers to action or activity systems in which aspects of co-knowing guide coordinated actions in work groups. Groups can enact their collective competence through coordination and ordering of collaborative activity by mediational means. Thereby, the collective competence of distributed teams is seen in the ability to collectively 'make sense of the situation' (Boreham 2004: 10). To ground a concept of collective competences, *events of collective*, *object related sense-making* are explored.

This notion of dealing with situational ambiguity is also touched by Orlikowski's (2002: 253) aspect of 'continuity of competence'. However, in her practice oriented approach, the focus is more on the level of enacted practices. By citing Weicks' (1996) concept of mindful interactions during accidents, Orlikowski (2002) sees the establishment and reification of a skilful practice in concrete enactments during phases of organisational ambiguity. Collective competence is defined by Orlikowski (2002: 267) as the 'knowing how to deliver timely, innovative, and complex products in a global organization'. In this view, collective competence is 'inseparable' from the reifying practices and refers to a certain repertoire of practices developed in a specific organisational context. Such practices enable concealment of the inherent discontinuities in globally distributed work, for example by developing the know-how of coordinating task interdependences across different time zones (cf. Watson-Manheim et al. 2012).

To distinguish enacted practices, Engeströms' (1992) differentiation between cooperative and coordinative modes of interaction seems fruitful. One can speak of coordination in boundary spanning collaborations when a shared understanding regarding the division of work, roles and task diversification is reified by specific boundary-spanning practices (Wehner et al. 2000). Collaboration requires an intersubjective symbolic mediation to achieve a shared orientation towards the innovation objectives, as for example by co-constructing early prototypes or mock-ups. Besides the merely task-oriented process practices, interpersonal and socio-emotional processes will be taken into account as part of enacted processes (cf. Ruuska and Teigland 2009). On the level of interaction

process between actors, collective competences were explored as established *repertoire of enacted process practices* on an interpersonal as well as a task-related level.

Besides those significant definitional and conceptual differences, the major similarity between the reviewed models could be identified as the importance of understanding the normative context in which certain actions of teams are defined as competent. Independent of the models' theoretical perspective, the development of collective competences has been conceptualised as being dependent on contextual requirements such as specific goals, or tasks, as well as respective contextual factors in more systemic approaches (cf. Kauffeld 2006; Lönnblad and Vartiainen 2012; Vartiainen 2014), or as respectively reified conversational practices (cf. Arnaud 2009; Boreham and Morgan 2004; Orlikowski 2002). Furthermore, in the delineated models discerned levels of collective competences are conceptualised as interacting in the process of collective competence development, change and retention.

Methods

For the specification of the elements that constitute future requirements of distributed team competences, a multi-phase expert survey was conducted (see Okoli and Pawlowski 2004; Robinson et al. 2005 for similar procedures). To get insights from experts from different functional fields, the survey was conducted within the European Cooperation in Science and Technology (COST). The COST initiative 'Dynamics of Virtual Work' (IS1202) connects experts from various disciplines such as information and communication theory, business communication, economics, social psychology and sociology as well as experts in the field of social informatics and open-source software engineering.

The experts were chosen according to the number of publications in the field of teams or collectives which interact in dynamic, global settings (e.g. research on collaboration in Wikipedia, global and virtual teams, global software development, change management in global organisations). The experts had peer-reviewed publications in the fields

of collective knowledge bases, competences, capabilities and success factors for collectives acting in dynamic settings. According to the rule of openness towards the topic of research in a qualitative-heuristic research paradigm (Kleining and Witt 2001), the process of sampling interview partners was left open. For the first round of interviews 14 experts were initially selected. Furthermore, the selection of interview partners was guided by the rule of maximal variation of perspectives regarding the discipline of the researcher and the field of study (Kleining and Witt 2001). For the second round of interviews, 11 experts with specific expertise on the topic were chosen to narrow respective collective competences on the discerned levels (see Fig. 10.2 for an overview of the research steps).

In the first round of the expert interviews, mostly open-ended questions were asked to explore the field of future competences to experts in one to one-and-a-half hour interviews. The interviews of the first round were analysed towards similarities across the differing disciplinary as well as field-related perspectives (Kleining and Witt 2001). In a first step,

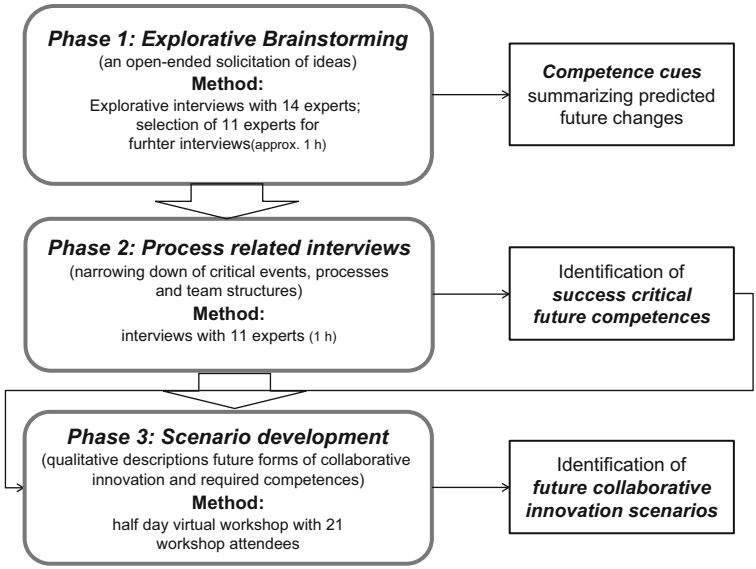

Fig. 10.2 Design explorative study on required collective competences (adapted from Okoli & Pawlowski, 2004; Robinson, Sparrow, Clegg, & Birdi, 2005)

similar perspectives regarding future oriented socio-technical enablers for distributed innovation processes could be identified.

Initially, the second round of the expert survey was planned as a survey where the identified competences should be rated according to the importance of specific phases of distributed innovation. Following the rule of openness claimed for qualitative-heuristic research (Kleining and Witt 2001), it was decided to proceed with another round of half-standardised interviews. This was because the results of the first iterative cycle of analysis for similarities could not yet be narrowed down to similar concepts. This round of interviews now focussed more on a concrete case level to identify required collective competences.

According to the proposed procedure by Scholl et al. (2004), the last round of the expert survey was conducted in a focus group and final workshop setting. The workshop was used to discern future forms and processes of globally distributed innovations as well as respective enablers. In the workshop different perspectives were integrated in the development for required collective competences in distributed innovation settings. Thereby, the virtual workshop could contribute to the understanding of future scenarios for globally distributed innovations.

Results

In a first iteration of the analysis towards similarities (cf. Kleining and Witt 2001), three innovation fostering cycles emerged from substantive data: an ideation cycle including early evaluation of mock-ups and prototypes, a decision oriented cycle which focuses more on micro- and macro-political influence strategies to achieve decisions for finding required resources, and a cycle of implementation in which ideation has to be implemented in specific contexts. The cycles could be differentiated according to the required competences on the discerned levels. For each cycle we will present team level specific aspects of situated sense-making, enacted process practices and respective mental as well relational structures which enable teams to innovate in distributed settings (see Table 10.1).

Table 10.1 Identified collective competences for distributed collaboration

Cycle	Ideation	Decision	Implementation
Collective Competences			
Shared structural characteristics	Knowledge of distributed and diverse expertise	Distributed networking resources/ social capital	Structural task and goal interdependence
		Shared knowledge of regulation, rules and norms	Shared communication and coordination norms
	Supportive and safe communication climate	Shared identification with the project aim	Shared team identity
Enacted practices	Asynchronous brainstorming/ exploration of ideas	Influence practices in decision processes	Established project management practices
	Synchronous co-creation of sketches, models and mock-ups	Reputation building and informal networking	Socio-emotional regulation/ conflict management
Situated, object-related sense making	Making sense of diverse perspectives	Bridging differences in understanding through visualisations	Transcending discontinuities in collaboration through plans and scripts
	Addressing discrepancies in the distributed setting	Creating commitment and shared understanding	Recurring feedback and reflection events

Furthermore on the individual level, general leadership competences were identified which enable globally distributed collectives for innovation. A team leader for distributed innovation should act as facilitator, 'who creates the environment, who has to understand what we create and what we are'. A proactive type of behaviour, contacting team members actively, was mentioned as the other key skill. According to the requirements of different cycles within the innovation process the team leader has

to create an enabling team climate and pay attention to the atmosphere of the group, reflect on the dynamics of the team and manage the individual roles and tasks. Therefore, for the discerned cycles a leader needs to know which socio-emotional as well as organisational enablers and respective mediational artefacts or tools promote innovative team practices.

Identified Collective Competences for Ideation Cycles

In the interviews it was reported that in ideation cycles the main challenge is to 'make room for shared mental models among people who differ significantly'. It was stated that team members 'differ on a topic, but also on an opinion of how to do something'. Therefore, ideation cycles should support the development of a shared understanding of respective innovation objectives. In globally distributed contexts often different understandings regarding goals between distributed team members lead to divergence. To create a shared understanding regarding the innovation objectives, the recognition of differences and discrepancies should trigger an exchange of interpersonally meaningful as well as critical task-related thoughts. Hence, during such co-constructive processes it is important 'to tease out the teams basic assumptions […] and to discuss the deep level assumptions, what a word means,[…] because they are coming from a different culture'. 'Raising the differences to the surface' and making sense of the diverse perspectives on innovation objectives and required means to achieve them becomes essential.

The establishment of synchronous co-constructive processes requires practices which maximise the innovative potential: 'So, creativity is especially important in the ideation by sketching or building something from a draft to more concrete'. Also, 'it is crucial to externalise the ideas as a kind of boundary object, and to give a kind of form to the idea, either a sketch or a model, or written text'. Such collaboratively constructed objects or artefacts have the function to foster more creative ideas. For such synchronous processes of co-creation it seems necessary to create an environment or a space out of ordinary everyday work practices, as the following interview statement shows: 'We usually […], just change the location completely, and we spend half a day or whole day in a board

room just asking questions, figuring out what the production should look like'. Even though the interview partners agreed on the necessity to create places for more expansive co-creation cycles, there was no agreement about the importance of face-to-face (f2f) contacts to enable idea development. Finally, the expert panel agreed on the usefulness of shared environments, which enable a certain degree of co-presence and also possibilities for visualisation of early ideas in the form of models and co-creating early mock-ups. As one interviewee stated, 'it's getting people together in a same space whether it is virtual or f2f, [because] you need the devoted attention and communication'. So the important aspect was not necessarily enabling f2f contacts, but in enabling people to share a space, in which personalised contacts and respective means for creating things together enable the development of creative interaction practices, thus, enabling places for co-constructive interaction.

Additionally, to raise the synergetic potential of cultural diversity it was mentioned as important to establish processes of 'wide open brainstorming, where you never say no to anything, and you throw everything out there, and you look for associations between things you look for, clusters of ideas'. Such explorative processes can be supported via asynchronous or text-based media, such as anonymous crowdsourcing platforms, or more traditional discussion forums. To reach as many people as possible: 'ideation can accept any number of people and they don't have to agree to that point, it's just about getting ideas out'.

The development of interpersonal relationships and trust was mentioned by the interview partners as being important in ideation cycles, because it enabled the development of team climates, which supported the free flow of ideas. Such climates enable people to 'feel free, to speak about the ideas they have and ways of implementing those ideas'. To enable such open communication flows it was mentioned to be crucial to get 'rid of the power distance and hierarchy' as it was enabling 'that things are transparent and that things can be said, also if it is not nice to hear'. A certain willingness to 'fail as a group' was also mentioned, as it is important for co-creation. Another dimension of the climate which promotes co-creation was the fact of having fun when creating things together. This can be enabled through game-like approaches: 'That is why games are so popular, because you are getting engaged, you are having

fun, so it's the incentive scheme'. Games can help to turn conflicts into creative task-focused conflicts.

To enable such co-creative climates leaders need to be 'good at perceiving the team climate, so that everybody feels fine, feels respected'. A 'strong focus on making people confident to share new ideas' has to be set. Thus, team leaders have to enable co-creative places by providing the respective resources for both asynchronous brainstorming and synchronous processes. Through collaborative interaction practices, an early shared perception of desired goal states and respective means to achieve them can be developed. Sharing of an early goal understanding does not imply that there has to be a complete overlap 'it just mean[s] that the individual views are sufficiently close, […] for working on a collaborative project'.

Identified Competences for Decision Making Cycles

Even though the sequence and the pace of cycling between different states of the innovation journey were different, the cycle of finding the network and reaching decisions to touch relevant resources was important across cases. Or as one interviewee put it 'beyond the shared understanding, if you want to move through the chain of the innovation process, then you have to be able to leverage the resources'. The identification of collective competences was not straightforward for this cycle. Most of the competences are leadership skills such as 'discernment, you need the ability to argue a strong case'.

Furthermore, gaining access to a network of potential contributors as well as the required networking competences to get important stakeholders aboard was evaluated as critical for success. Gaining reputation within the network is seen as an essential interpersonal skill. The networking competence still resides rather on the level of leading individuals involved in innovation endeavours, but the combined use of different networks of partners can be seen as a distributed networking capability. In this sense, globally dispersed collectives tap into relationship resources which improve the chance for touching ground, as for example in the case of the development of Wikipedia as a global encyclopaedia. Such structural or social capitals can be furthered by respective networking practices on the

level of enacted processes. The ability to multiply your reach is central, 'the more people you can hook up, and get on your project, the more you can spread your idea and the more ability you will have to actually gain access to resources within the network'. This process is supported by a combination of distributed 'people who are cheerleaders or spokespeople, who will go out and talk about your product, or your effort'. Future oriented practices for enabling an even wider access to network resources were perceived in the use of 'internal and external crowdfunding platforms […], which […] bring together […] people across the world'. As crowdfunding platforms increasingly diversify and serve in specialised niches, the appropriate use of such platforms requires specific knowledge, to estimate the legitimate platform for a respective idea.

Besides the access and reach to globally spread network resources, this cycle involves taking decisions. Again, here is a dividing line that could be drawn between interviewees, who were studying fields of primarily digital communities, for example Wikipedia, or researchers studying in fields where f2f meetings were a common practice. For decisions in Wikipedia the importance of a complicated rule-based system was mentioned. Important political decisions regarding next steps were taken in organised events with specific decision procedures to reach consensus. For important decisions in informally grown platforms there seems to be in principle a core of very concerned people, who have political influence. In such communities 'the earliest entry always has an advantage over the newest entry'. Authority and power is exerted by the online reputation, as well as through the fact that elders know the rules of the game. Knowledge about such authority structures enables collectives to influence decision making processes. In more traditional fields, the creation of events was mentioned as important. For example, in company-based software engineering so-called showcase events in a face-to-face setting with the community of influential persons such as potential investors and customers were recurrently organised. Additionally, the importance of showing prototypes to set the grounds for discussing the idea and getting feedback was mentioned in the process of decision making. Ideas have to be held simple and catchy, so 'you can break that up, into like three or four sound bites, where it's really easy to convey the idea'. In both cases

the notion of structuring events to present the catchy idea for bridging respective boundaries of understanding and setting the grounds to reach towards supportive decisions were highlighted.

On the level of structural team characteristics, the development of catchy ideas to leverage the resources for the projects supports the development of a 'shared language, shared norms, the identity'. The development of a shared goal understanding and identity leads to increased motivation for work on the team tasks in a distributed environment.

Identified Collective Competences for Implementation Cycles

The aforementioned cycles enable the development of a shared understanding for getting implementation of things such as the development of software, the organisation of ecosystem changes within Wikipedia or a change in a globally distributed organisation. The goal of implementation was defined by an interviewee as 'getting some particular thing done'. Across the fields, the interviewees reported the need for structural characteristics like shared norms, beliefs and rules, as well as shared mental models. A more closely coupled system has to be developed in which 'maintaining social order' and protecting the team's identity has become more important to be efficient 'than sort of socialising new contributors to the system'. Team level structural characteristics, which then support implementation cycles depend on the '[r]ight distribution of group roles and the right distribution of technical and non-technical competences, this could be the key, that you should know how to make these guy's [sic!] work'. In implementation cycles, because of a better understanding of the process of implementing the innovative ideas, the tasks can be distributed. A key element is the creation of 'interdependence of tasks', which operatively means that work is structured in a way 'that I can't get my work done, unless you do your work'.

To create a shared orientation for coordinated activities, shared norms and rules for collaborating in a globally distributed context need to be established. On a level of enacted practices establishing a shared understanding of rules and norms for computer-mediated communication,

several interview partners proposed developing so-called communication contracts, agreements or netiquettes where you externalise guiding rules and norms for the use of specific tools. In the same time, relevant social risks such as for example dealing with unexpected absences or fluctuations should be discussed as well as how to handle them. So it is about developing rules 'for communicating, or how to behave in case of emergency', to develop shared expectations. By such enacted negotiations of rules and norms, in early phases of implementation cycles a 'common understanding and common awareness' for the interdependent project work is created.

Besides the purely technical project management process, it seems important to make sure that people are engaged and motivated. Managing the task becomes as important as managing relationships. Leaders have to enable '[t]hat everybody feels that she/he is part of this wonderful team which is doing extremely well, just putting the task and the good relationships on equal line'. In order to motivate people and keep that engagement, leaders are required to integrate functional experts from different contexts towards tightly coupled, coordinated systems. This requires leaders to act as facilitators to 'get over the conflict phase and get it finished, because often creative people are not the best finishers'.

Within an implementation cycle, disruptions or unexpected events were not perceived as being functional. If one wants to actively implement, disruptive factors such as different understandings regarding the procedure to achieve the work objectives have to be suppressed. Thus, situated sense-making is focused on maintaining shared understanding rather than questioning it. At the same time, it is important that rules have some kind of flexibility. Such flexibility should enable switching between cyclical modalities, if situations require a re-evaluation or reflection of required means as well as goal states. Regarding flexibility, a learning was taken from agile project management methods in the software development industry where practices to 'reflect on the status of team work and how it progresses and what possibly are the weaknesses and what are the strengths are established in re-occurring cycles with the customers.

Discussion

Across the diverse fields integrated in the explorative study on future requirements for global collaboration competences, differential competences could be identified for the discerned process cycles: ideation, decisions for leveraging resources, and implementation. The heuristic value of the process model of collective competences proved to be prolific in two ways. Firstly, the value was confirmed by identifying differential collective competences respective to the discovered cycles in the innovation process on the level of situated, object related sense-making, and enacted practices, as well as structural characteristics. Secondly, the heuristic model and the role of the leader as facilitator of environment and climate in respective cycles has value for practitioners who plan to innovate in globally distributed settings. The process related and substantive descriptions of specific collective competences can be used as orientations for managing such collaborations. In the following paragraph the identified competences in the cycles are mirrored with relevant literature and the limitations of the study are discussed.

Collectives collaborating in globally distributed settings require the establishment of a shared orientation by making sense of different understandings regarding the innovation objectives and the involved boundaries (Watson-Manheim et al. 2012). Contradictions might emerge through different expectations regarding the objectives held by members from different communities.

For early ideation cycles, the activity oriented models of conceptualising collective competences (cf. Arnaud 2009; Boreham 2004), matched better to the identified competences. To start ideation in distributed settings collective competences on the level of situated, object related sense-making, such as creating a shared awareness and attention towards a problem, state or idea definition were mentioned. To support the expression of different perspectives and early development of minimally shared ideas of innovation objectives, the relevance of reflective communication or co-constructive knowledge practices has already been shown in field studies in distributed settings (cf. Engeström 2001, 2004; Hakkarainen et al. 2011). Such enacted process practices should provide an optimal balance between asynchronous

idea exploration in brainstorming processes and synchronous co-constructive practices. Especially for reflective communication in so called co-constructive practices (Engeström 1992), the provision of resources and the creation of a shared place enables grounding for the development of a shared understanding of the innovation objective. According to the trialogical perspective on knowledge creation (Hakkarainen et al. 2011: 72), early forms of co-created innovation artefacts such as models or mock-ups should be knowledge-laden, leave room for interpretation and be at the edge of the knowledge horizon. Such objects should 'function as originating sources of novel conceptualisations and innovative solutions' to support further object related sense-making.

To support such a process of idea development and refinement on the level of structural characteristics, a socio-emotional climate which is based on trust, supports risk taking, enables respect of different opinions and deliberation of differing views, was described by the interview partners. Those descriptions can be compared with socio-emotional climates described in the literature, such as team psychological safety (Edmondson and Lei 2014), or participative safety (Anderson and West 1998). Such climates have been shown to attenuate negative effects of global distribution on innovation processes (Gibson and Gibbs 2006), as well to mediate supportive structures on team performance in research and development projects (Bresman and Zellmer-Bruhn 2013). In the same vein as studies which point out the role of leaders for creating participative climates (cf. Detert and Burris 2007; Walumbwa and Schaubroeck 2009), the interviewees mentioned that leaders should act as facilitators for creating a place for creative co-construction. Leaders are perceived to take over the role of facilitating voices of members from differing communities with communication methods and tools.

Aspects of transformational leadership (Bass 1985), such as inspirational and motivational competences, were mentioned as being crucial competences during decision cycles. For bringing new expertise, as well as time and financial resources, into the innovation process, Ruuska and Teigland (2009) also mentioned the importance of leaders' knowledge-broker skills. Leaders should have high levels of reputation in diverse communities, be able to negotiate meanings between different communities, and influence respective stakeholders by presenting the idea

in a convincing way. Networking skills, such as creating links and relationships with relevant stakeholders, were perceived as crucial by our interview partners. A new aspect on the level of structural characteristics of collective competences in this study, is the combination of social capital of globally dispersed facilitators, which grants access to diverse communities. Distributed facilitators can act as multipliers of the idea, for example through crowdfunding platforms, thereby leveraging the idea on a global level. When achieving different and wider publics through the internet, ideas have to be communicated and visualised in a more simplistic and easily understandable way, to persuade and transcend differences between the involved communities. In the decision cycle, visualisations of early ideas in so-called showcases could help to attract potential contributors and investors. This notion of visualisation in decision cycles is comparable to the concept of social mediation developed by Paavola et al. (2012). According to this perspective, in decision cycles externalisations such as visualisations or prototypes, which build concern and new relations, are important artefacts for getting people committed and engaged.

High degrees of identification with the innovation objective was perceived as a pre-requirement for starting to implement ideas into concrete products, services or organisational renewals. In the implementation cycle, the identified competences most likely matched with the systemic models of collective competences and the proposed structural characteristics. Structural aspects of shared knowledge, such as the pre-requirement of a minimally shared understanding of the innovation object, as well as shared mental models of coordination processes and task interdependences, were mentioned (cf. Kokko et al. 2007). The development of a strong team identity was seen as being important, especially in implementation cycles. A shared team identity was shown to increase productive task related information elaboration (cf. van Dick et al. 2008) and to attenuate conflicts, for example in case of delays in interdependent task processes (cf. Hinds and Mortensen 2005). On the level of enacted processes, effective management of interdependences (cf. Hertel et al. 2004), effective project management and the creation of re-occurring rhythms (cf. Maznevski and Chudoba 2000), could be shown to enable global collaborative work. The importance of balancing task related strains by respective socio-emotional competences of leaders acting as process facilitators, has been proved (Ayoko et al. 2012).

As shown, the interviewees pointed to the importance of the creation of a virtual place in the different innovation cycles (cf. Dourish 2006). For example, within the ideation cycle the ability to create a shared place, which fosters brainstorming processes, was explicitly mentioned. By providing tools and methods that enable an open, participative externalisation of different understandings of innovation objectives, a place for ideation and co-creation in the distributed setting can be established. In globally distributed settings with limited possibilities for f2f contacts, respective technological artefacts should be developed, which allow externalisations of early ideas and the co-construction of mock-ups. The cycles could be distinguished according to the objects or mediating artefacts (cf. Paavola et al. 2012), which fostered social practices for addressing or transcending discontinuities (cf. Watson-Manheim et al. 2012). So, for example in decision cycles, visualisations, as well as language-based externalisations of ideas, were able to increase the commitment of diverse communities to attract more resources. In the implementation cycles, externalised plans or maps and contractual agreements focused more on a normative orientation for distributed activities (cf. Arnaud 2009; Paavola et al. 2012). The focus was less on getting more and diverse people on board, and more on the creation of a shared orientation for coordinated activities by transcending inherent differences. The framing of different places of interaction, via mediational artefacts, with regard to the purpose of the respective cycles is increasing the ability to achieve collaborative innovation in globally distributed settings. The awareness of how design and innovation practices are culturally embedded in respective places (cf. Irani et al. 2010) can be seen as a required competence to create specific mediational artefacts, which allow the development of innovative design ideas and solutions for complex problems which transcend cultural differences in a global context.

As a limitation of the study, it has to be noted that the sampling of interviewees remained in extended circles of the COST action IS 1202 'Dynamics of Virtual Work'. Thus, the study was mostly restricted to persons from European research institutions. Therefore, the range of applicability of the preliminary model is restricted to a European perspective on globally dispersed innovation processes. Regarding future research, it would be interesting to expand the sample globally, to

investigate similarities and differences in the understanding of team level characteristics that are critical for success. Additionally, a further expansion of the sampling towards practitioners directly engaged in the field would provide more substantial data to increase the external validity of the model.

References

Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: development and validation of the team climate inventory. *Journal of Organizational Behavior, 19*, 235–258.

Arnaud, N. (2009). Analyse d ' une conversation: Ouverture du stock de connaissance de la compétence collective. In R. Ocler (Ed.), *Sémantiques et organisations: Mythes, fantasmes, non dits et quiproquos* (pp. 1–19). Paris: l'Harmattan.

Ayoko, O. B., Konrad, A. M., & Boyle, M. V. (2012). Online work: Managing conflict and emotions for performance in virtual teams. *European Management Journal, 30*, 156–174.

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York: Free Press.

Berg, N. (2006). Globale Teams: Eine kritische analyse. *Zeitschrift Für Personalforschung, 20*(3), 215–232.

Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. (2009). A dialectical perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 2*, 305–337.

Bolten, J. (2008). Reziprozität, Vertrauen, Interkultur. Kohäsionsorientierte Teamentwicklung in virtualisierten multikulturellen Arbeitsumgebungen. In E. Jammal (Ed.), *Vertrauen im interkulturellen Kontext* (pp. 69–94). Wiesbaden: Verlag für Sozialwissenschaften.

Boreham, N. (2004). A theory of collective competence: Challenging the neoliberal individualisation of performance at work. *British Journal of Educational Studies, 52*, 5–17.

Boreham, N., & Morgan, C. (2004). A sociocultural analysis of organisational learning. *Oxford Review of Education, 30*, 307–325.

Bresman, H., & Zellmer-Bruhn, M. E. (2013). The structural context of team learning: Effects of organizational and team structure on internal and external learning. *Organization Science, 4*, 1120–1139.

Burgoon, J. K., & Hubbard, A. S. E. (2005). Cross-cultural and intercultural applications of expectancy violations theory and interaction adaptation theory. In W. B. Gudykunst (Ed.), *Theorizing about intercultural communication* (pp. 149–171). Thousand Oaks, CA: Sage Publications.

Detert, J. R., & Burris, E. R. (2007). Leadership behavior and employee voice: Is the door really open? *Academy of Management Journal, 50*, 869–884.

Dourish, P. (2006). Re-space-ing place: "Place" and "space" ten years on. In *Proceedings of the Conference on Computer supported Cooperative Work (Banff)* (pp. 299–308). Alberta: ACM Press.

Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review of Organizational Psychology and Organizational Behavior, 1*, 23–43.

Engeström, Y. (1992). Interactive expertise: Studies in distributed working intelligence. *Research Bulletin*, 83 .Retrieved October 12, 2013, from http://eric.ed.gov/?id=ED349956

Engeström, Y. (2001). Expansive Learning at Work: Toward an activity theoretical reconceptualization. *Journal of Education and Work, 14*(1), 133–156.

Engeström, Y. (2004). New forms of learning in co-configuration work. *Journal of Workplace Learning, 16*, 11–21.

Engeström, Y., Puonti, A., & Sepännen, L. (2003). Spatial and temporal expansion of the object as a challenge for reorganizing work. In D. Nioclini, S. Gherardi, & D. Yanow (Eds.), *Knowing in organizations. A practice-based approach* (pp. 151–186). New York: Sharpe.

Gibson, C. B., & Gibbs, J. L. (2006). Unpacking the concept of virtuality: The effects of geographic dispersion, electronic dependence, and national diversity on team innovation. *Administrative Science Quarterly, 51*, 451–495.

Gilson, L. L., Maynard, M. T., Young, N. C. J., Vartiainen, M., & Hakonen, M. (2015). Virtual teams research: 10 years, 10 themes, and 10 opportunities. *Journal of Management, 41*, 1313–1337.

Gröschke, D. (2010). Gruppenkompetenz in interkulturellen Situationen. *Interculture Journal, 9*(12), 51–78.

Hakkarainen, K. (2009). A knowledge-practice perspective on technology-mediated learning. *International Journal of Computer-Supported Collaborative Learning, 4*, 213–231.

Hakkarainen, K., Lallim, J., Toikka, S., & White, H. (2011). Cultivating collective expertise within innovative knowledge-practice networks. In S. Ludvigsen, A. Lund, I. Rasmussen, & R. Säljö (Eds.), *Learning across sites. New tools, infrastructures and practices* (pp. 69–86). Abingdon: Routledge.

Hertel, G., Konradt, U., & Orlikowski, B. (2004). Managing distance by interdependence: Goal setting, task interdependence, and team-based rewards in virtual teams. *European Journal of Work and Organizational Psychology, 13*, 1–28.

Hinds, P. J., Liu, L., & Lyon, J. (2011). Putting the global in global work: An intercultural lens on the practice of cross-national collaboration. *The Academy of Management Annals, 5*, 135–188.

Hinds, P. J., & Mortensen, M. (2005). Shared identity, shared context, and spontaneous communication distributed teams: The moderating effects of shared identity, shared context, and spontaneous communication. *Organization Science, 16*, 290–307.

Irani, L., Vertesi, J., Dourish, P., Philip, K., & Grinter, R. E. (2010). Postcolonial computing: A lens on design and development. In *Proceeding of the ACM conference on Human Factors in Computer Systems* (pp. 1311–1320). Atlanta, GA: ACM Press.

Janssens, M., & Brett, J. M. (2006). Cultural intelligence in global teams: A fusion model of collaboration. *Group & Organizational Management, 31*, 124–153.

Kauffeld, S. (2006). Self-directed work groups and team competence. *Journal of Occupational and Organizational Psychology, 79*, 1–21.

Kleining, G., & Witt, H. (2001). Discovery as basic methodology of qualitative and quantitative research. *Forum: Qualitative Social Research, 2*(1), 1–16 Retrieved from http://www.qualitative-research.net/index.php/fqs/article/viewArticle/977.

Kokko, N., Vartiainen, M., & Lönnblad, J. (2007). Individual and collective competences in virtual project organizations. *The Electronic Journal of Virtual Organizations and Networks, 8*, 28–52.

Krumm, S., & Hertel, G. (2013). Knowledge, skills, abilities and other characteristics (KSAOs) for virtual teamwork. In A. Bakker & D. Derks (Eds.), *The psychology of digital media and work* (pp. 80–99). East Sussex: Psychology Press.

Lönnblad, J. and Vartiainen, M. (2012) *Future competences—competences for new ways of working*. Turku.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71–87.

Maynard, M. T., Mathieu, J. E., Rapp, T. L., & Gilson, L. L. (2012). Something(s) old and something(s) new: Modeling drivers of global virtual team effectiveness. *Journal of Organizational Behavior, 365*, 342–365.

Maznevski, M. L., & Chudoba, K. M. (2000). Bridging space over time: global virtual team dynamics and effectiveness. *Organization Science, 11*, 473–492.

Melkonian, T., & Picq, T. (2010). Competence in extreme projects: Lessons from the french special forces. *Project Management Journal, 41*(3), 79–90.

Okoli, C., & Pawlowski, S. D. (2004). The Delphi method as a research tool: An example, design considerations and applications. *Information & Management, 42*, 15–29.

Orlikowski, W. J. (2002). Knowing in practice : Enacting a collective capability in distributed organizing. *Organization Science, 13*, 249–273.

Paavola, S., Engeström, R., & Hakkarainen, K. (2012). The trialogical approach as a new form of mediation. In A. Moen, A. I. Morch, & S. Paavola (Eds.), *Collaborative knowledge creation. Practices, tools, concepts* (pp. 1–14). Rotterdam: Sense Publishers.

Panteli, N., & Fineman, S. (2005). The sound of silence—The case virtual team organising. *Behaviour & Information Technology, 24*, 347–352.

Retour, D., & Khromer, C. (2006). La compétence collective, maillon-clé de la gestion des compétences. In A. Klarskeld & E. Oiry (Eds.), *Nouveaux regards sur la gestion des compétences* (pp. 149–183). Paris: Vuibert.

Robinson, M. A., Sparrow, P. R., Clegg, C., & Birdi, K. (2005). Design engineering competencies: Future requirements and predicted changes in the forthcoming decade. *Design Studies, 26*, 123–153.

Ruuska, I., & Teigland, R. (2009). Ensuring project success through collective competence and creative conflict in public–private partnerships—A case study of Bygga Villa, a Swedish triple helix e-government initiative. *International Journal of Project Management, 27*, 323–334.

Ryser, T., Schulze, H., Vollmer, A., Seyr, S., Huber, C., Müller, H., et al. (2011). Eine handlungsorientierende Typisierung globaler und virtueller Kooperationsformen. *Wirtschaftspsychologie, 3*, 7–20.

Scholl, W., König, C., Meyer, B., & Heisig, P. (2004). The future of knowledge management: An international delphi study. *Journal of Knowledge Management, 8*, 19–35.

VAN Dick, R., VAN Knippenberg, D., Hägele, S., Guillaume, Y. R. F., & Brodbeck, F. C. (2008). Group diversity and group identification: The moderating role of diversity beliefs. *Human Relations, 61*, 1463–1492.

Vartiainen, M. (2014). Hindrances and enablers of fluent actions in knowledge work. In P. Sachse & E. Ulich (Eds.), *Psychologie menschlichen Handelns: Wissen und Denken—Wollen und Tun* (pp. 95–111). Lengerich, DE: Pabst.

Walumbwa, F. O., & Schaubroeck, J. (2009). Leader personality traits and employee voice behavior: Mediating roles of ethical leadership and work group psychological safety. *The Journal of Applied Psychology, 94*, 1275–1286.

Watson-Manheim, M. B., Chudoba, K. M., & Crowston, K. (2012). Perceived discontinuities and constructed continuities in virtual work. *Information Systems Journal, 22*, 29–52.

Wehner, T., Clases, C., & Bachmann, R. (2000). Co-operation at work: A process-oriented perspective on joint activity in inter-organizational relations. *Ergonomics, 43*, 983–997.

Weick, K. E. (1996). Prepare your organization to fight fires. *Harvard Business Review, 74*, 143–148.

11

Spatial Phenomena of Mediatised Work

Caroline Roth-Ebner

Introduction

In Cultural and Social Sciences, space is perceived as culturally or socially constructed, as a result of communicative and social action (as noted by Funken and Löw 2003). According to the theory of mediatisation (Krotz 2007; Hepp 2012), media play an important role in transforming space, space-related perceptions and actions (Krotz 2007: 39). ICT or digital media,[1] along with the ongoing process of virtualisation, have led to the flexibilisation and dissolution of the boundaries ('*Entgrenzung*') of existent spaces and to the emergence of new spaces. In a recent study, entitled '*Mediatization of Work*' (Roth-Ebner 2015a), the interrelation between the mediatisation of office work and the phenomena of space and time was explored. This chapter is based upon this research and will present results concerning the transformation of space in the context of mediatised office work. In order to frame the results, the next section

[1] In this paper, the term 'digital media' is used synonymously with ICT as modern ICT operate mainly on a digital basis and as the convergence of media makes the distinction of media and technologies obsolete.

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will provide the theoretical basis by discussing concepts that describe space and the space-constructing character of media. After the specification of the methods in section "Methods", the study's results concerning the question of how the use of media at work changes and molds space, spatial perceptions and spatial behaviour, will be explained in the third and main part. The outcomes' implications for the individual will be mentioned in the final section.

Theoretical Concepts Applicable to the Relation between Media and Space

The core thesis of the theory of mediatisation as conceptualised by Friedrich Krotz is that media 'is something that modifies communication' (Krotz 2009: 23) or as Andreas Hepp would say: 'Media as such exert a certain 'pressure' on the way we communicate' (Hepp 2012: 14). Based on the theory of symbolic interactionism, communicating with media also changes the way we construct our realities. Thus, it changes our culture, our social relations, our modes and conditions of work (Krotz 2007: 12). To give an example, in the print era a message could have taken days or weeks to reach the recipient, whereas nowadays the internet allows instant transmission in real time. This leads to well-known phenomena like accelerated communication loops, increased communicative activities and, of course, permanent connectedness. For the context of the research at hand, the conceptualisation of mediatised office work is especially relevant. In fact, it can be described by four salient points:

1. Technological innovations and the ubiquitous use of the internet lead to ongoing processes of virtualisation, making work independent from a particular physical place and electronically mobile (Rump 2010).
2. Global communication leads to processes of global networking and global markets. At the same time, globalisation calls for global communication infrastructures.
3. Digital media provide personalised work equipment that can contribute to the process of subjectification.[2] ICTs require the individual's

[2] I hereby refer to the German discussion on the 'Subjektivierung von Arbeit' (Moldaschl and Voß 2003). The term describes an increased space of action of the individual. The individual is self-reliant in terms of the success of tasks or projects and must carry the risks on his/her own.

entire performance capacity, for example when coping with technical unpredictabilities or handling complex tasks alone (as is the case in the work of journalists who now also take photos, record films and release them on the internet).[3]
4. The possibilities of space- and time-independent media use lead to the blurring of boundaries between private and professional spheres.

As stated above, the theory of mediatisation also asserts the transformation of space through communication with media (Krotz 2007: 39). Actually, this assumption is only valid against the background of a constructivist understanding of space. As for this work, concepts that interpret space as a product of interrelations are useful to describe the relation between media and space. For example, the human geographer Doreen Massey (2005: 9ff) conceptualises space using three characteristics:

1. Space is constituted through relations and interactions.
2. Space implies a multiplicity of space. Massey emphasises the heterogeneity of space in different cultures and geographical contexts.
3. Space is constantly being constructed through our actions. Hence, space is understood as open and never finished.

Communicating with digital media at work influences all three characteristics of space as conceptualised by Doreen Massey. In section "Transformation of Space" of this chapter these relations will be explained using examples from the research at hand.

Methods

Based on the elaborated theoretical assumptions, my research was aimed at a special group of people called 'digicom workers'. They are described as office workers who work intensively with digital media. The smartphone,

[3] On the other hand, ICTs can contribute to the phenomenon of standardisation as information is processed in a standardised way and as they aim for rationalisation (Roth-Ebner 2015b: 2).

iPad and notebook are their virtual offices and their attendants throughout the day. Without ICT, their work would often be bereft of purpose. In most of the cases, digicom workers are highly flexible in terms of time and space. Digital media are the enablers of that flexibility.

In my research, I was interested in the following questions that are posed around these digicom workers:

1. How does the use of ICT at work change the workers' perceptions of time and space?
2. Which chances and challenges can be derived from these changes, and what coping strategies are used to deal with these challenges?

This paper focuses on the first question and especially on the issue of space.

The research was conducted from 2009 to 2013 and followed a triangulation strategy. A research question that aims at understanding the perceptions of time and space and the time- and space-related actions of individuals, demands interpretative approaches. Hence, the main methodological source of the investigation lies in 20 qualitative guided interviews. They were conducted in 2010 and involved digicom workers in different working contexts and employment situations. For example, the group included managers, software designers, communication consultants, entrepreneurs and scientists. A detailed sample description cannot be provided for reasons of anonymity. Tables 11.1 and 11.2 however give a rough overview of the demographic data of the interviewees and the nature of their employment.

Immediately after the interviews, the digicom workers were asked to draw a picture in answer to a given question or impulse and to comment on it afterwards. This interpretative methodological approach was developed by Christina Schachtner (1993) for the context of media research. It helps to illustrate the subjective meaning systems of the interviewees and allows the discovery of new aspects, which did not occur to them during the conversation. Examples of these visualisations are provided as Figs. 11.1 and 11.2 in this paper. In anticipation of the interviews, the diary method was applied. The participants of the study had to document their ICT use at work for a period of one week. This helped them to reflect

Table 11.1 Interviewees by age and gender

Age	Number	
	M	F
20–30	3	2
31–40	3	4
41–50	4	4
Total	10	10

Table 11.2 Interviewees by employment type and gender

Employment	Number	
	M	F
Employee, full-time	4	6
Employee, part-time	0	2
Freelancer	2	1
Entrepreneur	4	1
Total	10	10

on their media use in order to be able to speak about it. In addition, the diaries allowed the interviewer to prepare for the conversations. All qualitatively collected data were evaluated with the help of approaches taken from the Grounded Theory, a research programme, developed by Glaser and Strauss (1967), which organises the collection of data, codification, analysis, and theory development as a circular model.

In order to generalise the findings of the qualitative investigation, an online survey ($N = 445$) was implemented. This survey did not exclusively aim at digicom workers by definition, but also at people who use ICTs at work at different levels of intensity. This ranged from people who write one e-mail per week to heavy media-using digicom workers. People from different branches and forms of organisations were invited to participate in the inquiry. Hence, the link to the survey was disseminated to special interest groups, public sector organisations, scientific institutions, and private enterprise companies in Austria. A snowball effect arose, because some of the contacted persons posted the link to the survey on their websites or intranet portals or spread it via social networks or e-mail. Table 11.3 demonstrates the sample of the online survey, Table 11.4 lists the sectors and types of employment.

Table 11.3 Demographics of the survey sample

	N = 445
Gender	
N (%)	
Male	140 (31.5)
Female	301 (67.5)
n.s.	4 (1.0)
Age	37.05 (10.39)
M (SD)	
Highest level of education	
N (%)	
Completed apprenticeship	12 (2.7)
Abitur (Higher Education Entrance Qualification)	119 (26.8)
Vocational Secondary School	19 (4.3)
College/University	291 (65.3)
n.s.	4 (0.9)

Table 11.4 Types of employment in the online sample

	N = 445
Sector *N* (%)	
IT/computer branch	49 (11)
Public administration	53 (11,9)
Education	147 (33)
Finance/insurance	17 (3.8)
Industry	23 (5.2)
Trade	34 (7.6)
Manufacturing trade	14 (3.1)
Services	59 (13.3)
Tourism	7 (1.6)
Health and social care	46 (10.3)
Others	51 (11.5)
Type of employment *N* (%)	
Freelancer/entrepreneur	97 (21.8)
Employed, full-time	236 (53.0)
Employed, part-time	172 (38.7)
Position *N* (%)	
Managerial	127 (28.5)
Non-managerial	318 (71.5)
Working time model *N* (%)	
Fixed working times	129 (29.0)
Gliding time (with core time)	187 (42.0)
Flexible time	161 (36.2)

The results presented in section "Transformation of Space" of this chapter will mainly refer to the digicom workers; however, there will be an indication of the extent to which they also apply to the broader population.

Transformation of Space

The overall findings of the study revealed the transformation of space in several respects. Firstly, the time- and space-related independence of work leads to a flexibilisation of the workspace. Secondly, there is an extension of space in the context of virtual work. Thirdly, digital communication and virtual work result in the reduction of distances. Fourthly, new forms of presence emerge. In the following sections, these phenomena will be explained using examples from the study. In fact, they cannot be separated strictly, as they overlap and interact with each other. For example, the flexibilisation of the workspace is enabled by the use of digital media and virtual work, which implies the extension of the virtual workspace. Moreover, the newly emerging forms of presence are a result of the extension of virtual space. Finally, the extension of virtual space itself goes hand in hand with the reduction of distances, as communication and work are translocated to virtual spheres, which connect people who are physically separated.

Flexibilisation of the Workspace

As they can be used independently from time and space, digital media enable the efficient organisation of work processes and mobile, flexible work. Work can be taken anywhere. It is common practice among the digicom workers to check business e-mails on the way to work, for example while on the tube, or to work from a home office in order to allow more concentrated work. Even the beach can serve as suitable location for participating in an online conference. The examples illustrate the theoretical concept of the 'electronic mobility' of work—a mobility which is enabled by digital media (Rump 2010) and leads to the flexibilisation of the workspace. In many cases, spatial flexibility is dealt with routinely.

For example, fixed home-office days are agreed between the companies and the workers, or some kinds of work are more likely to be conducted at home in order to allow greater concentration. Another example is provided by an entrepreneur who, from time to time, conducts strategic meetings with his team in a coffee shop, so as to get new inspiration.

As the study's results disclose**,** digital media can be defined as a kind of virtual office. This aspect occurs in numerous interviews, but is especially well represented by a visualisation drawn by a male unit manager in the television industry after the interview (Fig. 11.1). This is what he sketched when he was asked to draw his workspace.

The picture is symbolic of his flexible mode of working: He has two jobs as an employee and, in addition, he is preparing to launch his own business in Austria and in the United Kingdom. In his bag he carries four mobile phones—each one is used for a different job or engagement. Digital media, above all cellular phones, allow him to switch quickly from one engagement to another. The case of the unit manager is exemplary for most of the digicom workers, who work under extremely flexible conditions and who make use of digital media to provide and/or handle this flexibility. Typically, digicom workers are not bound to a specific working

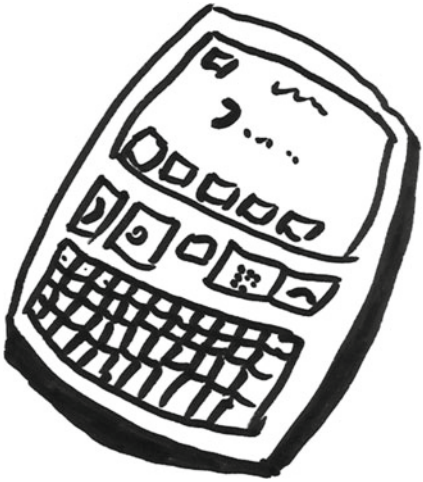

Fig. 11.1 The smartphone as (virtual) office

space at all. They work at the offices of the company, at their home office or on the move. This is true for the managers, entrepreneurs and freelancers as well as for the scientists in the sample. Some of the interviewees are predominantly bound to the company building. These are highly qualified employees holding responsible positions. They work partly at their home office and/or, in terms of meetings or business trips, also on the move. In the sample, only some digicom workers positioned at lower hierarchical levels are totally bound to the location of the company. In fact, the correlation between the position in the company and the amount of spatial flexibility is confirmed by the survey data, which reveals that workers in leading positions are significantly more flexible regarding their working spaces than workers in non-managerial positions.

This is also the reason why the general media users, who were interrogated by the survey, are not as flexible as the digicom workers: While the interviewed digicom workers mainly work in leading positions, less than 30 per cent of the participants in the online survey belong to management. As the survey showed, only one third (33 per cent) of the general media users is able to at least partly define their preferred working space. Consequently, the flexibilisation of the workspace through ICT use is not a general phenomenon for the entire sample group, but especially evident for workers in managerial positions.

Virtual Extension of the Workspace

While the above described flexibilisation of the workspace represents a physical extension, in the context of virtual work, the study's results reveal a virtual extension of the workspace, which is produced by the use of digital media. New virtual working spaces emerge; they are, for example, virtual communication spaces such as social network sites or communication rooms provided through online conferences. Moodle or knowledge management systems serve as virtual learning rooms, and team software provides collaborative spaces on a virtual basis. These virtual rooms have different functions: they serve to communicate, to organise work, and to conduct and evaluate work. These working spaces are often used in a parallel mode. In one of the interviews, a 30-year-old female product manager provided the following insight into her working day:

> […] I almost always work on several problems simultaneously. The e-mails I receive tend to arrive throughout the entire day. As a general rule, I try to answer them immediately. And then, I might be in the middle of something, for example, I might be performing a test run [for a developed web tool, CRE]. A test might take anything from 15 minutes to several hours. If I receive an e-mail during that time, then I will at least take a look at it. I might not respond until later. I read the message. Sometimes, I receive an inquiry via messenger at the same time; I mean instant messenger. And then many activities, by their very nature, also require parallel actions. To give an example, I have a problem […] Then I have to check in our, we have a specific application, the core product, where this type of data is recorded. […] So then I access that and take a look at the data, to see what it looks like. At the same time, I use a separate programme to connect directly to the database, so that I can enter SQL (Structured Query Language)[…] queries.[4]

On her screen (which she shared with me), several virtual windows that represent working rooms are open and overlap. Simply by clicking, the digicom worker can move from one room to another. In order to deal with these different virtual workspaces, the product manager uses two monitors—as do most of the digicom workers. Thus, the extension into virtual space is also represented through the extension of the screens.

As the online survey revealed, rather unsurprisingly, the virtual working environment, represented through instant messaging, team software, online conferences and so on, is not as relevant for the general media users as for the intensive media users. For example, just two per cent of them have ever participated in an online/video or telephone conference. Thus, the results on the digicom workers cannot be generalised in terms of the aspect of an extended virtual workspace.

Reduction of Distances

The third phenomenon can be described as the reduction of distances. Global digital communication and virtual work connect people from all over the world, including in the context of close collaborations. Co-workers can be just one click away, even though they are located across the globe. One example is provided by the statement of a senior manager, who labels the window

[4] All quotes are translated from German.

of his instant messenger tool as the 'door into the world, because from that window I can call people, I can chat with them, I can phone them. It is all a mouse click away'. In the globally acting company, in which he is employed, all desks are equipped with instant messenger technology in order to facilitate worldwide communication. For another digicom worker, a university professor, digital media are the proper tool to cultivate her international contacts. When, years ago, she decided to move to Malaysia, she faced the danger of scientific isolation. Yet, she determined to work actively against that threat. Thus, the professor, who has 350 Facebook friends, purposefully uses social networks, e-mail and instant messenger to socialise across the globe and to maintain her established contacts.[5] For an entrepreneur, who lives in the United States but runs her company in Europe, the aspect of connecting to people located thousands of kilometers away is also essential. She manages this via digital media, for example via e-mail, instant messenger or team software. The picture she drew after the interview is her answer to the question about how relevant digital media are for her work (Fig. 11.2).

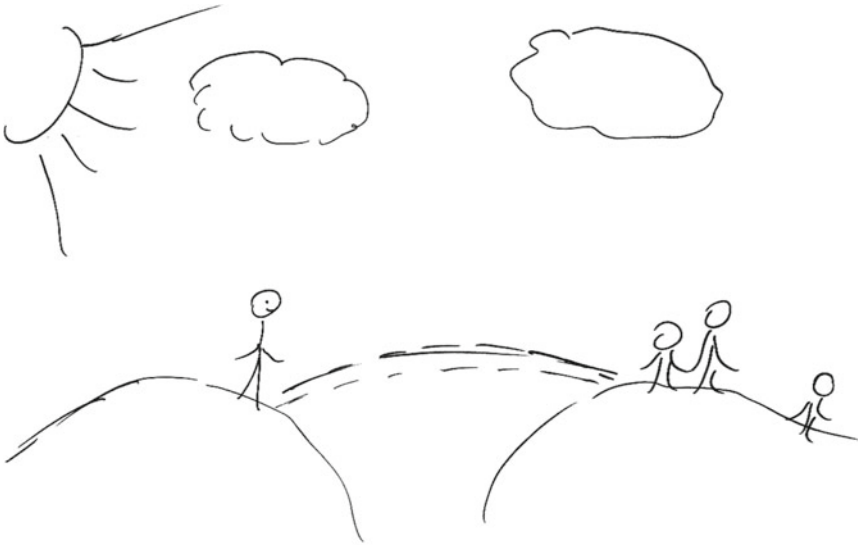

Fig. 11.2 Connected across the globe via digital media

[5] Besides the implication for shrinking distances, this example also explains the relevance of networking as a key competence in a mediatised working environment.

To illustrate what digital media mean for her work she uses the metaphor of a bridge. Digital media are 'a bridge to friends, a bridge to my family, a bridge to customers, suppliers, to the business', she explained during the interview. As she added, the divide between herself and her social contacts can be overcome by using digital media, which is represented by the bridge.

Even though the above mentioned examples of global work and communication illustrate the thesis of reduced distances vividly, the phenomenon can also be observed on a regional or local scale. For example, a university professor usually arranges appointments with his team via telephone conference, although they are all located in the same building. Hence, he does not have to walk from office to office in order to speak to them about their availability, but simply phones them, which makes the process of scheduling easy and efficient. Another example is a process designer who also uses the company's chat tool for private communication in the sense of an office chat. The reason is that she sits in an open plan office and is surrounded by partition walls. If she wants to talk to her colleagues face-to-face, she has to stand up and walk to one of the other cubicles. Via chat she can 'talk' without moving from her desk and without the chat being noticed by the others. Without the tool, the digicom worker would not be able to chat so easily, and maybe the social relations at work would not be as good as they are.

In contrast to the virtual extension of the workspace, the experience of shrinking distances is not limited to the intensive use of digital media. Rather, it seems to be very widespread: 90 per cent of all respondents to the survey agreed to the statement that digital media help them to get in touch with distant persons.

New Forms of Presence

As Katharine Willis has stated, 'presence becomes more ambiguous, since previous reliance on the visual to orientate and structure awareness in space is augmented with non-visual presence in technological networked spaces' (Willis 2008: 15). This can also be observed in the context of the digicom workers' practices. For example, the status information in instant messengers acts as a virtual agent that indicates the presence of

a person in the virtual working environment. Shared group calendars, too, enable easy and efficient scheduling and provide information about the co-workers' locations and diary schedules. Another example of new forms of presence is online conferences that enable people from all over the world to participate without moving from their local desks. One of the interviewed digicom workers—he works as a management consultant—spoke about his experience of a meeting in the virtual reality world 'Second Life'.[6] He claimed to enjoy it,

> because you can see the position of the persons in the room. In a flat online conference system, okay. There, the persons are sitting more or less next to each other. But in Second Life you can see who is located at what distance and who is talking to whom and so on. Then you get such strange emotions. 'Is it ok to take a seat next to this person? […] Or is it inconvenient', if someone in a conversation does not keep his or her distance?

As the quote shows, he seems to immerse himself in the world behind the screen. He even transfers feelings and conventions like proximity behaviour from the offline into the virtual world. Actually, he is present in his physical surrounding, which can also be a beach, as mentioned above. Additionally and at the same time, he is co-present in the virtual conference setting.

One can also speak of new forms of presence when a person uses his/her computer workstation via remote control or shares his/her desktop virtually and in real time with others. One example of the first case is given by a project manager in the building industry. As a general rule, she leaves the computer in her office turned on in case she needs something from the computer during her leisure time. As she mentioned in the interview, her boss regularly calls her to request a printed construction plan. Via remote control she can issue a print command wherever she is—internet connection assumed—even when she is on holiday abroad,

[6] Second Life is a huge and complex three-dimensional virtual environment where the participants have an avatar and experience anything from entertainment to meeting people, and even business.

and her boss can simply retrieve the plan from the printer in the office.[7] Desktop sharing is another phenomenon that causes 'ambiguous presence'. That means that two or more persons who are dislocated but connected via a network can virtually access the same computer desktop. This practice is often used in IT support.

For the general media using participants in the online survey these new forms of presence are obviously less relevant than for the digicom workers, because they rarely use elaborate virtual communication tools—as explained above.

Effects of the Spatial Phenomena on the Individual

As the study revealed, the spatial phenomena do have differentiated and sometimes even ambivalent effects on the workers.

As far as the positive effects are concerned, the workers benefit from location independence (flexibilisation of the workspace). An example is provided by the case of a senior female scientist. She works part-time, has two children to take care of and often works from her home. She uses digital media to combine her work and her family life. At the very beginning of the interview, she declared emphatically:

> The reason to use these media for me is to be flexible, related to space as well as to time. 'I have two children and I am employed part-time'. […]. Right after the birth of my second child, I recommenced working on projects. At this time, I just could not always be at the office. That is why I looked for the proper tools that enable me to work from home and also while on the move.

Hence, digital media are the prerequisites for her professional life. Related to the virtual extension of the workspace, the workers profit from

[7] This example also counts as an example for ubiquitous connectivity, which is a broad phenomenon in the mediatised working environment. In the case of the project manager, she claimed to be accessible for her boss voluntarily, because they have an implicit agreement that, on the other hand, she is also free to take leave more often than usual.

efficient and transparent work organisation. A security manager in an IT company explained during the interview that in his company tasks are recorded in a ticketing system[8] so that anybody in his team can process the task and examine its status. Under these circumstances, work can be realised very efficiently. The workers also take advantage of the possibility to communicate and work without meeting in person. This makes collaborations possible—be it across the globe or at a regional scale—without moving geographically (reduction of distances). The above mentioned case of the entrepreneur who runs her company in Europe from the United States illustrated that, as well as the example of the university professor who arranges appointments with his team in telephone conferences. The new forms of presence provide a transparence (of tasks, of the workers' presence and availability), which is especially important in virtual working contexts. Status information in instant messengers, shared group calendars and other groupware help to make teamwork easy to coordinate and efficient.

However, the other side of the coin is that mobile and time- and space-independent possibilities of media use (flexibility of the workspace) pile on the pressure of ubiquitous connectivity with the company or with customers, as has been shown by the example of the ever-ready-to-print project manager. Another challenge is the permanent exposure to work in the context of non-defined borders between professional and private life. A sales manager who tries to spend time in the afternoon with his children talks about the feeling of being torn between his work and his family:

> Because I work at home a lot, it is not always easy for the children. […] Well, at about 3 p.m. many calls tend to come in. Then I am in the living room with the children, but every five minutes someone calls. That is very hard for them. So, I keep telling them when I come home: "I'm not quite here yet. I have to conduct many phone calls during the next one and a half hours. Then I will switch it off, then we can have our time together".

The sentence 'I'm not quite here yet' illustrates the blurring of the boundaries. He feels neither 'at work', nor 'at home', but somewhere in

[8] A ticketing system is a software programme for the organisation of tasks, for example customer queries. For each task a ticket is issued and processed. All work processes of the task are replicable and verifiable. Connected via network, whole teams have access to the same system and the same data.

between and he has to deal with this challenge.[9] Relating to the virtual extension of the workspace through the overlapping of different virtual working spaces, the workers suffer from insufficient attention that is caused by switching very quickly from one context to the next. For example, the product manager cited above who usually works on different tasks simultaneously, also mentioned being stressed by the multiplicity and urgency of different tasks. Similarly, the excessive demands that result from the intense use of digital media and the unceasing confrontation with communicative tasks can also lead to stress, which can be defined as 'communication overflow'. The product manager explained how the blinking pop-up window of her instant messenger regularly disrupts her from concentrated work and exerts pressure to answer. 'You are forced to react immediately. I actually feel my heart throbbing, a tightness in the chest', she declared. The overcoming of distances through virtual communication (reduction of distances) also might result in impersonal or superficial communication and relations. That is why most of the interviewed digicom workers place emphasis on meeting their counterpart in person at least once. This is also the reason why the entrepreneur who runs her European company from the United States regularly flies to the company's location in order to personally check that everything is in order. As for the new forms of presence, one can also observe new forms of control and monitoring along with that phenomenon. Status information in instant messengers, for example, shows when a person is at their desk, when they are busy or inactive. Moreover, shared group calendars provide information about a person's appointments, presence and availability. A senior manager explained during the interview that the instant messenger, which is a central tool in his company, automatically changes the status information of the workers. If a computer does not record any activity for a period of five minutes, the status information changes to 'away'. Hence, anybody in the company can see that the person is currently not actively working with their computer, which results in continuous surveillance. Actually, this brings to mind Foucault's reflections of the self-regulating panopticon (Foucault 1976: 251–292), where the potential surveillance leads to self discipline.

[9] The example also reminds of the concept of the 'ambiguous presence' explicated in the Sect. 3 of this chapter.

Table 11.5 provides an overview of the opportunities and challenges, connected to the spatial phenomena of mediatised work.

In fact, the question whether a phenomenon is perceived as a challenge or as an opportunity, is not easily answered. It differs depending on the context, for example individual preferences, the worker's position in the company, or on concrete situations. While using an instant messenger to communicate in a global company might be an efficient tool to stay connected to widely distributed team members (opportunity of efficient and transparent work organisation), in busy situations it can be perceived as interrupting and annoying (challenge of communication overflow). While on the one hand the flexibilisation of the workspace helps to arrange work in accordance with individual preferences and needs (opportunity of location independence), on the other hand it might result in the feeling of permanent work exposure.

Conclusion

The paper has shown that the use of media at work transforms space in terms of a flexibilisation of the workspace and of a virtual extension of the workspace. Moreover, the reduction of distances has been observed, as well as new forms of presence. While shrinking distances are relevant for all media-at-work-users of the sample, the flexibilisation of the workspace is especially evident for workers in leading positions. The virtual extension of the workspace and the new forms of presence, however, are specific

Table 11.5 Opportunities and challenges in relation to the spatial phenomena of mediatised work

Spatial phenomena	Opportunities	Challenges
Flexibilisation of the workspace	Location independence	Ubiquitous connectivity Permanent work exposure
Virtual extension of the workspace	Efficient and transparent work organisation	Insufficient attention Communication overflow
Reduction of distances	Location independence	Impersonal or superficial communication and relations
New forms of presence	Efficient and transparent work organisation	New forms of control and monitoring

for the elaborate media using digicom workers. Brought together with the theory of mediatisation explained in section "Theoretical Concepts Applicable to the Relation Between Media and Space", the results illustrate how communicating and working with digital media changes our modes and conditions of work, our perceptions of space and our space-related actions. The results can also be linked to Doreen Massey's (2005: 9ff) conceptualisation of space, in the sense that space is constituted through relations and interactions, which, by using digital media, produce a virtual working space. Although Massey meant it differently (see section "Theoretical Concepts Applicable to the Relation Between Media and Space"), the co-existence and overlapping of the physical and virtual working spaces can also be interpreted as a manifestation of the multiplicity of space. Finally, the assumption that space is constantly being constructed through our actions corresponds with the overall findings of the transformation of space through working and communicating with the help of digital media. As the results emphasise, space is not constructed by technology itself, but by the workers' media-related actions.

These spatial phenomena imply positive aspects for the individuals and, on the other hand, they also bear risks. In fact, it is very much up to the individual to cope with these challenges. Yet, the question has to be raised how policy makers, companies or education consultants could install framework conditions that unburden the individual.

References

Foucault, M. (1976). *Überwachen und Strafen. Die Geburt des Gefängnisses*. Frankfurt a. M.: Suhrkamp.

Funken, C., & Löw, M. (2003). Einleitung. In C. Funken & M. Löw (Eds.), *Raum—Zeit—Medialität. Interdisziplinäre Studien zu neuen Kommunikationstechnologien* (pp. 7–20). Opladen: Leske + Budrich.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: de Gruyter.

Hepp, A. (2012). Mediatization and the 'molding force' of the media. *Communications, 37*(1), 1–28.

Krotz, F. (2007). *Mediatisierung: Fallstudien zum Wandel von Kommunikation*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Krotz, F. (2009). Mediatization: A concept with which to grasp media and societal change. In K. Lundby (Ed.), *Mediatization: Concept, changes, consequences* (pp. 21–40). New York: Peter Lang.

Massey, D. (2005). *For space*. London: Sage.

Moldaschl, M., & Voß, G. G. (Eds.) (2003). *Subjektivierung von Arbeit* (2nd ed.). München and Mering: Hampp.

Roth-Ebner, C. (2015a). *Der effiziente Mensch. Zur Dynamik von Raum und Zeit in mediatisierten Arbeitswelten*. Bielefeld: Transcript.

Roth-Ebner, C. (2015b). The skills of the Digicom worker. *Journal of Technologies and Human Usability, 11*(2), 1–9.

Rump, J. (2010). *Managing electronic mobility. Eine Orientierungshilfe für Fach- und Führungskräfte zur Technikfolgenabschätzung*. Sternenfels: Verlag Wissenschaft & Praxis.

Schachtner, C. (1993). *Geistmaschine. Faszination und Provokation am Computer*. Frankfurt a. M.: Suhrkamp.

Willis, K. (2008). Spaces, Settings and Connections. In A. Aurigi & F. De Cindio (Eds.), *Augmented urban spaces: Articulating the physical and electronic city* (pp. 9–27). Aldershot: Ashgate Press.