ICTs and employment: The problem of job quality

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The International Labour Organization has declared its central goal to be the promotion of opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity. One of the key factors which will shape the ability of the ILO along with its partners to pursue this goal will be the impact of information and communication technologies (ICTs) on the quantity, quality and distribution of jobs. This impact will be indirect rather than direct: new technologies provide a basis for changes in the employment relationship through their effects on organizational forms, on product and service development and on the place and nature of work. These in turn have implications for the labour market institutions which shape the contract of employment and opportunities for collective regulation. None of these effects are predetermined, and it is the interaction between new technologies and other forces shaping employment which will determine the future of employment and job quality — the issue with which this article is specifically concerned. As argued by Castells: "while there is a common trend in the unfolding of the employment structure characteristic of informational societies, there is also a historical variation of employment patterns according to specific institutions, culture and political environments" (1996, p. 202).

In fact it is the open-ended nature of the potential effects of ICTs which creates the interest. Table 1 summarizes the rather polarized views that can be found in the literature and among policy-makers with respect to three dimensions of job quality: employment relations and employment protection, time and work autonomy, and skills and careers. For some, ICTs are the new way of liberating labour from the constraints of tedious work, defined by both time and space. For others, ICTs will generate new forms of control, spreading outside the workplace into the personal and domestic spheres of people's

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Table 1. Scenarios of work, flexibility and ICTs

Dimension of job quality	Pessimistic	Optimistic
1. Employment relations and employment protection		
Employment opportunities	ICTs destroy work (automation and rationalization)	ICTs create work (develop new markets and human capital)
Employment relations	Low-trust employment relations as ICTs are used to specify detailed performance standards	High-trust employment relations in new knowledge-based, learning society
Career opportunities	ICTs undermine internal career ladders, replaced by uncertain and competitive multi-employer careers	ICTs create opportunities for new flexible or boundaryless careers
Job protection and collective bargaining	ICTs lead to fragmentation and new employment contracts, undermining systems of collective bargaining and employment regulation	ICTs blur the boundary between employee and employer and thereby reduce the need for traditional employment protection/ regulation
Pay	ICTs reduce pay (downgrade skills and weaken workers' collective bargaining power)	ICTs increase pay (augment skills)
2. Time and work autonomy		
Work intensity	ICTs lead to work intensification	ICTs reduce time taken to perform tasks and thereby provide opportunities to reduce work effort
Power and autonomy	ICTs lead to a divided society (centralize power, control)	ICTs lead to more individual flexibility and freedom of choice
Work/life balance	Work takes over life (pressure to work everywhere, all the time)	Work is integrated with and subordinated to daily life (work adjusted to needs of family and life)
Work relations	ICTs isolate and impose stress on individuals (working in different times and places and being overloaded with information)	ICTs interconnect and stimulate individuals
3. Skills and careers		
Skills	ICTs downgrade skills and competence to single-task machine tending	ICTs upgrade skills and competence, multi-tasking, creativity
Job prospects	ICTs create “dead-end” jobs (surveillance and threat of outsourcing)	ICTs expand career opportunities (strengthen connectedness among organizations)

Sources: Based on *Information and Communication Technologies and the Information Society*, Report of the Institute for Prospective Technological Studies, Seville, 1999 (quoted in Shapiro and Iversen, 2000, p. 33).

lives. These scenarios are often portrayed as inevitable outcomes of new technological developments. In reality, however, job quality remains an issue of political choice, and the scenarios that will develop in practice will reflect political choices. These choices may be made by omission as much as by commission. ICTs may challenge existing institutional arrangements for the protection and development of job quality. To maintain that protection, new

institutions may need to be developed at both the national and international levels, but the political will or foresight to develop new protection systems may be lacking.

Before the impact of ICTs on job quality is discussed, the term "job quality" must first be defined. This term has clear links to the notion of decent work, which lies at the heart of the ILO policy agenda. Job quality can only be achieved if the four strategic objectives of the decent work programme are pursued: it must be supported by labour standards, employment opportunities, social protection and social dialogue. Job quality is dependent on employment opportunities because high levels of unemployment pose threats to labour standards. Social dialogue and social protection are essential safety-net mechanisms for the protection of labour standards and regulations. The term job quality includes but goes beyond basic labour standards to encompass the general promotion of rights at work. Job quality, as defined here, is not only a concern for highly skilled jobs or rich countries. It also relates to jobs at the low-skill end of the spectrum in every society, including those associated with unpleasant or menial features. The task for a job-quality strategy is not to eliminate these jobs but to improve their quality as far as is possible. The major dimensions of job quality can be considered to be:

- the skills involved in the job and the opportunity that the exercise of those skills provides for personal fulfilment or for social or productive service;
- the degree of autonomy or control the worker enjoys in the job;
- the fairness of the system of management control and discipline;
- the opportunities for freedom of association and collective bargaining;
- the security of the job, including opportunities to use the skills acquired with another employer;
- the responsibilities involved in the job and both the opportunities for job satisfaction that these provide and the stress that these may induce;
- the intensity of work and its implications for physical and mental health and for opportunities to have a satisfying personal and family life;
- the opportunities the job provides for developing and enhancing skills and for moving into more satisfying, more secure or better paid employment over a life cycle;
- the opportunities the job affords for contributing to creative activities of the organization, including problem solving, incremental innovation and the use of personal initiative based on developed skills and knowledge in the interests of improving quality or service.

Although the potential influence of ICTs on job quality relates to many dimensions of the employment relationship, there are three areas which can be identified as being of particular salience. The first centres on the implications of ICTs for changing organizational forms and for employment relations and employment protection; the second, on the implications of ICTs for

the time and autonomy dimensions of employment; and the third, on the implications of ICTs for changes in skills, work organization and job prospects.

The implications of the reshaping of organizational forms for employment protection

There has been extensive discussion, both in the media and in the academic literature, on the impact of ICTs in reshaping organizational forms and structures.[1] This restructuring involves, on the one hand, the rise of the so-called network organization — often associated with high-technology industries and occupations, with Silicon Valley providing the main exemplar — and, on the other, the increase in the practice of outsourcing both core and peripheral activities. Outsourcing, particularly of work involving lower level jobs, is indeed facilitated by the enhanced monitoring and control offered by ICTs. The influence of ICTs on the reshaping of organizations may therefore be quite pervasive, covering a wide category of jobs and workers, not simply those employed in ICT-based occupations. The extent of this impact is still largely speculative; there are still major doubts over both the operational scope of and the long-term viability of such concepts as the network or virtual organization (see ILO, 2001, ch. 3). However, the purpose here is to attempt to understand better how these changes in organizational forms pose potential future challenges to the protection and development of decent work.

Table 1 outlines three sets of pessimistic and optimistic scenarios with respect to employment protection. The first item relates primarily to the job-creation or job-destruction effects of ICTs: this is central to the overall employment effect but will not be fully discussed here. Instead, the discussion will concentrate on the implications of ICTs and new organizational forms for career opportunities, employment protection and pay.

The employment relationship and the network organization

Many of the explanations for the rise of the network organization are grounded, implicitly or explicitly, in the impact of ICTs on the employment relationship. The move away from bureaucratic organizations is largely identified as a consequence of changes in transaction costs. ICTs present employers with new, and expanded, opportunities for utilizing codified knowledge, previously only accessible in a tacit form. ICTs also facilitate the development of codified knowledge which, in turn, facilitates market transactions.

[1] This article draws on a research project on changing organizational forms and the reshaping of work, funded by the United Kingdom's Economic and Social Research Council as part of its Future of Work programme. The project is being carried out at the European Work and Employment Research Centre (EWERC) by a multidisciplinary team; other team members include Marilyn Carroll, Fang Lee Cooke, Jill Earnshaw, Irena Grugulis, John Hassard, Gail Hebson, Mick Marchington, Steven Vincent and Hugh Willmott.

Traditional hierarchical forms of management are being dismantled as the costs of monitoring and surveillance of workforce activity are reduced. Associated strategies include decentralization of decision-making, the creation of internal markets and the flattening (or "delayering") of hierarchies. Similarly, ICTs encourage the externalization of activities as transaction costs of monitoring external activities are reduced. As Sennett puts it: "The archipelago is an apt image for communications in a network, communication occurring like travel between islands — but at the speed of light, thanks to modern technologies. The computer has been the key to replacing the slow and clogged communications which occur in traditional chains of command" (1998, p. 23).

A wide range of empirical (and prescriptive) studies argue that organizations externalize activities that are not central to their "core competencies", through outsourcing, spin-offs and subcontracting (Prahalad and Hamel, 1990), leading to new organizational forms variously labelled as the "network organization" (Castells, 1996; Miles and Snow, 1996), the "core-ring" or "core-periphery" organization (Harrison, 1994) and the "web of enterprise" (Reich, 1991).

The increased opportunities for performance auditing pose a challenge to one of the accepted maxims of the study of employment, namely that the transaction costs are such that employers benefit from an open-ended employment contract, a contract of service which explicitly differs from a contract for services. The jury is still out on whether the current enthusiasm for outsourcing many functions is justified. As Bosch, Webster and Weißbach point out:

> some very radical decisions are being made to outsource apparently central core functions involving high levels of customer interaction. In these cases, recruitment and training of outsourced labour becomes critical: the employee's role is to provide the customer with an aesthetic experience of the company and service being provided …, to act as the company's ambassador …, and to perform "emotional labour" … In this context the personal qualities of the employee is of paramount importance. Companies that make use of outsourced labour nevertheless have to ensure that this conforms to the ethic and aesthetic which they wish to present. … but little is known about the future of such routine service functions that are outsourced (2000, pp. 108-109).

The case for outsourcing routine activities may therefore be more fragile than some employers and business analysts suggest. For non-routine activities, a different rationale for more fragmented organizational systems is suggested. As the future is relatively uncertain, partnerships and alliances may be used to yield short-term benefits without requiring major internal investments in new skills and technologies. In short, organizations have incentives to buy rather than to make. However, these partnerships and alliances are also rendered more complicated to manage by the increasing importance of gaining access to knowledge and information in a period of rapid technological change. On the one hand, their objective is to facilitate transfer of knowledge but, on the other, organizations need to be able to retain control of those vital pieces of knowledge — idiosyncratic knowledge as it is sometimes called — on which their own long-term competitiveness depends.

These contradictory tendencies towards both sharing and control of knowledge also have implications for the development of the employment relationship within fragmented organizations (Rubery et al., 2000a). Network relations set up to take advantage of reduced transaction costs will tend towards a "return to contract" (Streeck, 1987), i.e. more tightly specified employment contracts based on low-trust forms of employment relations and involving strict performance measurement. Network relations designed to enhance the learning capacity of the organization will be reliant on the skills and motivation of "empowered workers" and are therefore likely to favour the development of high-trust relations, both between the organizations concerned (Lane and Bachmann, 1998; Deakin and Michie, 1997) and between employers and those employees whose task it is to establish a productive network of relations. These contradictions, however, have not been fully explored in the literature on networking (Rubery et al., 2000a), though they parallel those identified by earlier analyses of the development of the employment relationship in the 1980s and 1990s (Streeck, 1987). Trends in the employment relationship are not necessarily unidirectional, nor are the interests of employers always served by forms of tight labour control.

Thus the emergence of network organizations has implications for the form of control and for the level of trust in employment relations. High-trust relationships have traditionally been associated with stable employment in large bureaucratic organizations. Network organizations tend to be smaller and to offer limited job security and career prospects. Workers in these types of organizations are more likely to see their careers as developing through movement between organizations instead of following a traditional, single organizational career path. These career paths are variously described as "portfolio careers" or, more dramatically, as "boundary-less careers" (Arthur and Rousseau, 1996). While current evidence does not point to any dramatic reduction in job tenure as yet (Auer and Cazes, 2000), expectations of job mobility have increased which in itself creates problems for the development of high-trust relationships based on an implicit psychological contract between the employer and employee. Under these conditions, there are concerns as to how employees can be trusted to pursue the interests of their current employer.

Some writers point to the importance of reputation reinforced through social networks both as a control mechanism for employers and as a means of access to the market for workers (Saxenian, 1996; Jones, 1996; Marsden, 1999 and 2000). Network organizations recruit on the basis of reputation and recommendation. As workers constantly have to renew and maintain their employability, reputation could be argued to be sufficiently important to ensure that they will work in the interests of their current employer. Examples are cited for Silicon Valley, Hollywood and other network labour markets where reputation is the basis of employability. This approach points to the tendency for all labour market forms to rely on social institutions and social relationships. However, there must be doubts concerning the information on

which reputations are based. Disentangling the contribution of an employee to an organization where that employee is only hired for a short period is extremely difficult. Indeed, the realization that reputation matters may lead employees to focus on high-profile but potentially superficial and poorly thought-out contributions to the organization. The mobile worker may also pay more attention to developing his or her reputation with client companies that are prospective employers than to pursuing the interests of the current employer. Moreover there is little that a worker can do to correct an unfair or biased assessment of her or his work where this is based on word of mouth and informal channels. The likely outcome is discrimination, intentional or not. The risks are particularly high because those who acquire poor reputations may be excluded altogether from jobs and reputations have to be constantly maintained and renewed over a lifetime.

Other ways of generating commitment for short-term assignments include shares in patents and royalties associated with the project (Marsden, 2000) or stock options. This type of system may appear to offer short-term employees a longer-term stake in the value of their work, but it also increases the risk borne by the short-term employees as they are paid partly for the work they carried out and partly on the basis of assets of unknown value. Whereas the traditional employment relationship required employers to bear the risk, under these arrangements the immediate rewards for networked workers may be kept at a low level and the risk shared between workers, entrepreneurs and investors (Caulkin, 2000).

This approach is of course in keeping with a view of future employment relationships in which the fundamental inequality and difference between workers and employers disappears. Some of the major differences between interpretations of the consequences of ICTs depend on whether or not employers are expected to play a less important role or simply a more hidden or disguised role in tomorrow's labour markets. For Miles and Snow (1996), the new relationships will lead not only to a reduction in employer power in the labour market but indeed to a reversal of traditional employer-employee relations:

> Thus, the cellular organisation does not "use" its members. Instead, it is used by them to facilitate their own business initiatives … In the cellular firm, the organisation functions not as an employer, but as the facilitating mechanism to promote the application and enhancement of the professional skills of its membership (Miles and Snow, 1996, p. 111).

The development of more fragmented organizations serves to obscure the role of employers in the labour market. This may be an intended or unintended consequence of fragmentation. Temporary agency workers are often treated as the employees of the agency or as self-employed even though they work side-by-side with the direct employees of client companies. The self-employed subcontractor has little independent market power but is obliged to share the risks of fluctuations in demand and has to be willing to work whenever he or she is required. The development of outsourcing has allowed

companies to take advantage of the lower terms and conditions prevailing in other sectors and countries and to avoid commitments to develop fair and integrated employment systems negotiated for direct employees. Network organizations, by offering share options instead of wages, turn employees into capitalist stakeholders. However, the net returns to labour under these conditions may not be any higher than they are under traditional employment relationships. In fact, the greater risk of capital failure could even reduce those returns (Caulkin, 2000).

New types of employment organization and the need for new forms of protection

One of the risks associated with current trends towards flexible organizations and flexible employment relationships is the breakdown of the standard, open-ended employment contract with its associated employment rights and opportunities for freedom of association. Some societies provide a range of basic rights and citizenship rights rather than employment-related rights (e.g. rights to health care, rights to pensions or support for non-work activities such as care work). But where such rights are linked to employment — for example, health insurance in the United States or rights to paid maternity leave in many countries — the implications of a move away from continuous employment, towards self-employment and new forms of employment contracts, are that much more severe.

The Supiot (1999) report for the European Commission suggests that the standard employment contract with its associated employment rights is becoming outmoded and outdated and that there is a need to rethink employment relationships and employment rights to provide greater flexibility not only for employers but also for citizens to move between different employers and different activities and statuses. It is possible that new ways will be found to deliver basic employment rights by redefining the employment relationships; for example, recent European Union legislation[2] has extended employment rights to workers, a concept designed to include those working under an employment relationship but who may be *treated* as self-employed, such as temporary agency workers. Nevertheless, it is more difficult to envisage ways in which these flexible employment relationships can generate the same level of opportunities for freedom of association and collective bargaining. Individual employment rights may appear to be the way forward as these need not be tied to stable, single employer-employee relationships, even though this has so far been the practice in many countries. However, individual employment rights have not emerged independently of the process of collective bargaining and freedom of association. Without strong trade unions and

[2] For example, Council Directive 97/81/EC concerning the framework agreement on part-time work. See *Official Journal of the European Communities* (Luxembourg), L 14, 20 January 1998.

collective bargaining it may be difficult to maintain the momentum towards improvement or even maintenance of employment rights.

New forms of work such as teleworking also require new approaches to employment protection. The number of home-based workers has been increasing only slowly in some OECD countries (Felstead et al., 2000), but there is more evidence of growth in the number of workers who have multiple workplaces (Stanworth, 1998) reflecting both mobility between clients and the development of hot-desking within organizations. These mobile workers are less likely to form close relationships at work and, therefore, to develop a sense of collective identity and solidarity. Trade unions have begun to show interest in these issues and have developed guidelines and suggestions as to how teleworking and teleworkers should be integrated into standard employment practices and collective bargaining systems but the mechanisms for implementing such approaches are unclear. Above all, trade unions will need to change their methods of recruitment and information. According to the Trades Union Congress of the United Kingdom, a key negotiating demand should be to gain access to the employer's email system for purposes of recruitment and information direct to all staff, including teleworkers (Bibby, 1996). There is, therefore, not only a need for new forms of legal protection based on wider definitions of employment, but also a need for imaginative rebuilding and renewal of labour market institutions, including forms of collective representation and negotiation.

Strong arguments can also be made in favour of the renewal of occupational labour markets supported by strong professional and trade union organizations (Marsden, 2000; Tolbert, 1996; Steedman, 1996; OECD, 1998). The development of new occupational labour market structures would serve three purposes. The first is to provide a basis for developing and ensuring employability: without recognized occupational labour markets it is indeed difficult for participants to acquire transferable skills. The second is to provide a potential basis for negotiation of terms and conditions between employers and employees or between employers and workers and for the development of mutual insurance to protect against insecurity. And the third purpose is to increase the possibility of improving job quality by locating individual jobs within established mobility and career structures and thereby allowing for the progressive development and accumulation of both skills and responsibilities.

Establishing the likely benefits to participants and to society at large, however, does not overcome the difficulties of establishing new institutions. Organizations are often unwilling to forgo their prerogative in the design of job structures (Crouch, 1997), and without agreed common standards and job titles the development of occupational labour markets is institutionally very difficult. Rapid changes in technology and the development of company-specific market niches compound the problems of agreeing upon new standardized occupational roles and titles. Moreover, new occupational and professional associations are likely to develop new codes of conduct and professional standards which will not only place constraints on employers, but

also potentially result in divided loyalties between the interests of the organization and those of the profession or occupation. There is indeed evidence of increasing tension between managerial objectives and professional creeds and ethics, particularly in public services (Thompson and Warhurst, 1998; Dent, 1998). These conflicting pressures are not necessarily unwelcome, because new occupational labour market institutions will only be capable of protecting the interests of workers or of acting as focal points for pressure to improve quality of service if they are able to place some constraints on managerial discretion.

Skill shortages — rather than problems faced by employees — could provide the catalyst for new forms of occupational labour market organization. In the field of ICT, there is already an urgent need to provide better information both on the skills which employees already have and on the types of skills that need to be developed to fill the skill gaps. There is also persistent tension between the desire to control the ICT labour process to contain costs and the need to harness the creativity and problem-solving abilities of ICT professionals (Greenbaum, 1998; Beirne, Ramsay and Panteli, 1998). More independent professional organizations for ICT workers could perhaps help reduce confusion in this occupational area between these competing pressures and establish a system of transferable skills outside the direct control of management.

The impact of ICTs on the time dimension of work

Time is at the centre of the changes taking place in the organization of production, markets and work. ICTs were critical to the emergence of the economics of time as the basis for current production and competitive systems, facilitating both just-in-time production and service delivery and the shortening of new product or service development and implementation cycles (Best, 1990). ICTs facilitate geographical dispersion and the continuous provision of information and service functions, allowing work to be carried out at non-standard times. The sum of these changes is a radical transformation of the conventional organization of time and space, comparable to earlier transformations associated with changes to transport systems, the development of the telephone and the distribution of electricity. While earlier technological developments promoted integrated production systems and factory-based standard employment, the current developments are expected to move the system back to a more fragmented environment of home-based work, small firms, self-employment and flexible employment contracts (Champy, 1995; Handy, 1989).

This outlook can be considered both a threat and an opportunity (see table 1 above). Information technology could in principle expand available time and reduce work burdens, as we move towards a paperless office and access information without travelling to libraries or attending meetings and conferences. But these opportunities for less burdensome work may be off-

set by the use of ICTs to intensify use of available time through monitoring activities and the progressive elimination of all slack or surplus capacity. ICTs could expand individual choice over patterns of work and enhance feelings of empowerment and freedom, or instead lead to more centralized control and surveillance of those at work. A central question is whether these changes will lead to work increasingly dominating all areas of life or to a better or more manageable balance between work and life. Another is whether the opportunity for more fragmented work by time and space leads to isolation or to feelings of connectedness. Direct communication with fellow workers at home and abroad through email can provide both psychological and technical support, but it may not compensate for the sharing of problems and work experiences over a cup of coffee. The resolution of these different scenarios must depend on political choices related to the design and implementation of ICTs. Technology is only one factor in the process of change, but the ways in which we develop technology now may of course constrain future choices.

With these general considerations in mind, four specific time-related issues will now be discussed. The first of these is the emerging evidence that ICTs are generating pressures towards increased work intensity. The next two concern the role of ICTs in shaping the "time dimension" of employment contracts. The fourth centres on the implications of ICTs for work and family life.

Time, work intensity and ICTs

The debate over flexible labour markets has recently widened from a concern with terms and conditions of employment to consideration of the effects of changes in employment systems on work intensity and on the psychological — as well as material or substantive — contract of employment. Some have argued that the current concern with job insecurity is not simply related to fear of job loss per se but to the loss of key features of a job, including the breakdown of norms governing work intensity (Burchell et al., 1999). While management gurus focused on the "working smarter" aspects of Japanese systems, more critical analysts identified that working smarter almost always involved working harder (Elger and Smith, 1994). The Japanese production system is focused on workflow and on identifying ways of eliminating any elements of unproductive time. While full-scale transfer of Japanese production systems has been limited, there has been a wider spread of new management techniques, facilitated by the development of ICTs which support new forms of production analysis and performance monitoring. Green (2000) has recently categorized these developments as "effort-biased technological change" (EBTC). He associates these developments with "amber lights technology" where workflows are kept at a constant level of almost full capacity, avoiding both green — which indicates spare capacity — and red, where bottlenecks and breakdowns occur. It is ICTs which have enabled management to maximize labour utilization and maintain regular workflows:

> This development is epitomised in the rise of the call centre, the so-called "20th century sweat shop" (Wazir, 1999). Though attention is often given to the ability of call centre managers to monitor and measure employees' outputs with great accuracy, just as important is the automated supply of work tasks — each call following its predecessor with no gaps (Green, 2000, p. 7).

Effort-biased technological change combines with the development of multiskilling to maximize work intensity. Evidence supporting the hypothesis of a significant increase in both work intensity and work stress has been found in a number of studies relating to the United Kingdom (Burchell et al., 1999; Green, 2000; Rubery et al., 2000b), including both case studies and larger, representative studies.

> Underneath all the rhetoric about new-wave management, the most important trend appears to be people working harder. Pressures on the effort-bargain are, of course, a constant feature of market relations. But the combination of increased competitive pressures for cost reduction on private and public sector organisations, with expanded means for reducing and recording "idle time", are leading to substantial work intensification, whether through reductions in manning levels and job demarcation, or other means … But the hollow laugh received when mentioning the word "empowerment" in most organisations is the true test that employees at many levels experience this "great innovation" less as the opportunity to exercise extra discretion and more as the necessity to undertake more tasks (Warhurst and Thompson, 1998, p. 9).

However, the impact of these new information technologies and new management systems on work intensity still depends on the social and political environment; the experience from the United Kingdom can therefore be considered an indication of their potential impact in an environment of low regulation and weak trade unions. Indeed, not all moves towards higher work intensity necessarily imply a decline in job quality because workers as well as managers may be frustrated if work organization is inefficient and production or service delivery is interrupted due to breakdowns or shortages of components or labour. In short, ICTs could thus be used positively to enhance work experience by enabling management and the workforce to avoid bottlenecks, though these enabling tools could also be used to change the rhythms of work and to push work intensity up to unsustainable levels.

Time, employment contracts and ICTs

The role of ICTs in shaping the time dimension of employment contracts varies according to the type of worker or occupation. Reich's (1991) distinction between routine production workers, in-person service workers and symbolic analysts can be adopted to identify these varying effects.

"Symbolic analysts" are those workers whose tasks are related to the use and application of specialist knowledge and to the development and maintenance of new markets and activities. This is the group typically regarded as being empowered by the development of ICTs. It is also the group whose employment position increasingly resembles that of the independent entrepreneur who not only has to carry out work but also has to generate the demand for that work. The reliance of organizations on the skills and creativ-

ity of symbolic analysts leads to ambiguous outcomes. On the one hand, workers in this group may be able to work out of their homes as well as out of an office and to schedule their working hours without reference to higher-level management. But this greater autonomy is counterbalanced by a requirement to work as much and for as long as is necessary to generate sufficient business and to complete the tasks assigned. Employers no longer feel an obligation to ensure that those tasks fit within a predetermined set of hours. Even at home, the pressures of the workplace may still remain, through work brought home or transmitted to the home through information technology. Symbolic analysts are usually paid a fixed salary, sometimes including bonus entitlements, but without entitlement to paid overtime. The absence of working-time standards creates serious problems for the introduction of part-time work into the corresponding occupations (Rubery, 1998a). Where the standard-setting "full-timer" works 60 to 70 hours a week, should a part-timer work 35 hours, or should she/he work say 20 hours for half the salary of a full-timer? It is in this type of work context that part-timers are said not to "pull their weight" or to be less committed.

Changes to working time are equally significant for those providing in-person services — Reich's second category of workers — even if they derive from different relationships. Here the main pressures towards more varied and non-standard working hours stem both from the desire to create new markets — by offering a wider range of in-person services and services more tailored to individual needs — and from changes in lifestyles. If the demand for services at particular times cannot be transferred to other times, meeting that demand will have consequences for working time. However, although the consumer does play a major role in structuring the working time of in-person service providers, this role is mediated by the organizations involved in the delivery of services, by the regulation of the market and by the use of ICTs to shape both the market and the organization of work (Bosch, Dawkins and Michon, 1994; Rubery and Horrell, 1993). For example, opportunities to operate clubs, discos or late-night retail services are determined by regulation as much as by the availability of potential consumers. Extensions of service provision do not necessarily attract new customers and may actually increase the costs of provision. Yet organizations may be prevented from concentrating services into a shorter period of time by the pressure to maintain their market share. Organizations involved in the provision of in-person services may use a variety of techniques to pass on to employees the costs of intermittent demand, which are made visible by ICT monitoring. Examples include paying low basic wages and a custom-related bonus, or using split shifts, short part-time working hours or self-employed workers.

Reich (1991) identified routine production workers, including routine service workers, as a third category. Here the work can be separated from the direct provision of a service to a consumer, for even if the consumer needs the service to be delivered at a particular point in time the worker need not be located directly beside the consumer. For example, a call centre may need to

have people operating the telephone lines to provide services when required, but the centre can be located at a distance, even outside the country; and the work of call centres increasingly involves semi or fully automated provision of services. As routine service and routine production work can, by definition, be decoupled from the consumption of the service or product, there is even more scope for the organization of services and the management of employment to influence the pattern of working hours and the forms of employment contract. The actual pattern of working hours will be determined both by market conditions — the extent of fluctuations in demand and their predictability — and by the pattern of industrial and employee relations. Whether preference goes to part-time or full-time work, standard hours or annualized hours, and teleworking or office working will be less determined by the pattern of consumer demand than in the case of in-person services and more determined by the organization and less by the individual than in the case of symbolic analyst services. Employee expectations and preferences, trade union strategies and cost considerations will all impact upon how working time is organized — even against a similar pattern of demand. The competitive pressure for just-in-time services and production places a premium on flexible working time patterns (in terms of both total hours worked and the pattern over the day and week), but trade union organization and social regulation can still have an influence on how flexibility is implemented.

Time, new labour-force divisions and employment contracts

The reshaping of work and working time is increasing time pressures across the labour market. At the same time, however, it is generating new forms of labour market divisions. The distinction between high- and low-discretion jobs is being mirrored by divisions related to the distinction between time-autonomous and time-constrained jobs. The cost of developing more autonomous forms of work — associated with network organizations and the increased focus on knowledge and learning — is a reduction in the right to separate working time from non-working time, coupled with pressures towards increased work intensity (Gregg, 1994; Campbell, 2000; Green, 2000; Burchell et al., 1999; Schor, 1991). Time availability for work may also be increasingly considered not as an input into performance, but as evidence of high performance; partly because of the problems of actively monitoring actual performance at work, commitment to work is signalled by time spent at work (Collinson and Collinson, 1997; Simpson, 1997).

Increasing attention is also being paid to the time management of work. Those in time-constrained jobs may be increasingly required to be available for work whenever required. Part-time jobs may not be easy to combine into full-time work, because each employer of a part-time worker wishes that worker to be available whenever required (Neathey and Hurstfield, 1995). This aspect of the new forms of part-time work serves to reserve part-time work for those in dependent economic positions, such as women. This com-

bination of strict time constraints with scheduling flexibility also means that households — even when short of work in terms of desired earnings — may still suffer from time constraints and time deficits. Movement towards shorter weekly hours of work can, if coupled with flexible scheduling, either increase or decrease time pressure at the household level.

The development of ICTs has thus been associated with the decline of the standard employment contract on account of moves in two directions: towards extended and unmeasured working time, on the one hand, and towards contractual arrangements involving shorter but tightly measured time, on the other (Rubery, 1998a; Rubery et al., 2000b). These trends contribute to polarization in the labour market. Part-timers often work in jobs designed as part-time jobs in contrast to people working reduced hours in full-time jobs. It is the separately designed part-time and flexible jobs which tend to offer poor opportunities for skill development and pay and career progression (O'Reilly and Fagan, 1998). Opportunities for working reduced hours are limited largely to workers with relatively high levels of bargaining power, unless the right is secured collectively either through strong collective bargaining or through well-developed systems of individual or parental employment rights (Rubery, 1998b). Part-time work may not be possible in higher-level jobs if there are no boundaries around the definition of full-time work. The organizational interconnections between full-time and part-time work do not only have repercussions for part-timers. Full-time workers on standard hours may come under increasing pressure to provide the scheduling flexibility that can be achieved with part-time workers and to give up their rights to extra compensation for flexible or extra hours. Thus, although the pressures on time-work relationships are taking different forms and have different causes, there is also a process of coercive comparison which can lead to the transfer of pressures from one segment to another once employers see the opportunity to relax traditional constraints on their organization of working time (Rubery, 1998b).

Time, work organization and the work/life balance

In principle, flexible employment and career systems might be expected to make it easier to mesh the pursuit of a career with varying needs for non-working time over a life course. However, this opportunity to create a better work/life balance does not currently appear likely to be seized. The concept of "boundary-less careers" has been applied only to boundaries between jobs, disciplines and functions — not to the work-family boundary.

> Indeed, the worker implicit in the boundaryless form of organization continues to be one whose ability, willingness, and energy to focus on work, and to develop new marketable skills, are unconstrained. … The problem … is that nothing in the new employment relationship challenges the underlying sense that work and family spheres are adversarial — that they represent an either-or situation for both the employee and the employer. In fact, … the two sides are often cast unwittingly as oppositional; and the goal of balance is seen as an individual choice achieved through rejecting — either permanently or for

a short time during child-rearing years — career opportunities in order to put personal or family needs first (Fletcher and Bailyn, 1996, p. 257).

Even when careers are based on a series of jobs, career interruptions may be taken as negative signals of commitment. Reliance on reputation for obtaining the next assignment places considerable pressure on the individual to maintain work effort and continuity. The open-ended employment contract provides protection against loss of employment during periods of high family or personal stress but no such protection is available to those who continually have to go to the market to obtain work. Similarly, selection of jobs involving part-time work sends negative signals to prospective employers and precludes the career development opportunities that full-time work provides.

Changes in the nature of work and in the scheduling and place of work create yet more obstacles. For symbolic analysts, the focus on problem solving and learning, coupled with heightened work intensity and work responsibilities result in increasingly permeable barriers between working time and non-working time (Harvey, 1999). Moreover, male workers use electronic technology as a means of continuing their separation from the family even when apparently spending time at home (Armstrong, 1999). Men tend to work in a separate room at home while for women telework and domestic work are more likely to be fused (Webster, 1996). The net result may be to reinforce gender divisions within the household, with men working in isolation from the family even during normal leisure hours and women working in a more integrated way, spanning family and work activities even during working hours. Men may be more able to combine telework with continued involvement in an organization (Stanworth, 1998), potentially obtaining the best of all worlds, while women are more likely to be only teleworkers, with all the problems of isolation that this involves.

For those working outside the home, the flexible scheduling of working time may create other problems for work/life balance. The more workers are required to be on call, the greater the variation in scheduling by day and by hour, the more difficult it is to establish patterns and rhythms in non-working time and to develop shared non-working activities. Even where groups or teams determine their own work schedules there are problems in accommodating different needs. Those without children may feel obliged to take on a disproportionate share of weekend work and resent having to accommodate the needs of others. Policies allowing for more family-friendly work patterns do not solve all problems if there is a lack of feeling of entitlement to exercise the corresponding rights (Lewis and Lewis, 1996). It is therefore important to support family-friendly policies with more general rights to a clear divide between work and non-working time and to relatively short and predictable working hours.

The impact of ICT on skills, work organization and job prospects

The concurrent transformations in ICTs and organizational structures have generated an abundant literature on the emergence of a new "knowledge economy" (for a review, see OECD, 1996). Particular concerns include how new technologies and "network" organizational forms are influencing the development of workforce skills, work organization and career paths. As shown in table 1, there are optimistic and pessimistic scenarios suggesting moves towards both upskilling and deskilling and towards enhanced and constrained discretion and autonomy at work. Workers also face potential changes in career structures arising from a shift from vertical hierarchical career structures to "delayered", horizontal structures, and from internal, "bounded" job ladders to a "boundary-less career" stretching across different organizations (Arthur, 1994; Arthur and Rousseau, 1996; Miles and Snow, 1996; Osterman, 1996; Saxenian, 1996). This section first examines how ICTs have impacted upon skill and then turns to the question of job prospects.

Skills: Polarization, upskilling and deskilling

The general finding in the mainstream literature is that ICTs have led to polarization of the workforce; pressures for accelerated skill development coexist with falling demand for less skilled workers, leading to falling wage rates and social exclusion (Autor, Katz and Krueger, 1998; Berman, Bound and Griliches, 1994; Bound and Johnson, 1992; Machin and Van Reenen, 1998; see also ILO, 1999).[3] These findings are generated from stylized models, based upon questionable assumptions regarding the pace of technological change and the speed with which the supply of skilled workers can adapt (Brown and Campbell, 1999). In a partial response to these criticisms, the polarization thesis has also been tested using data-sets that do include specific measures of technology. In an influential study on the United States, Krueger (1993) argues that new technologies augment workers' skills. This is demonstrated by estimating the wage differential associated with computer use for a typical worker and attributing the observed wage premium to unobservable skills required for computer use (such as computer fluency). The typical wage premium for computer use is 15 to 20 per cent; proof, it is argued, of the hypothesis that ICTs have contributed to the recent polarization of wages in the United States (ibid.). A key weakness of Krueger's study, however, is the attribution of unobservable skills to ICTs.

[3] This finding was also significant in explanations of the changing wage structure. Analysis of national-level data demonstrates that skill-biased technological change had a greater impact on change in wage structure than did other variables, such as the collapse of manufacturing, or the decline of union membership (Bound and Johnson, 1992; Katz and Murphy, 1992; Juhn, Murphy and Pierce, 1993).

Using an even more detailed data-set for Germany, DiNardo and Pischke (1997) also find a wage premium associated with computer use but similar premia can also be found for using a calculator, a telephone, a pen, and even for sitting down.[4] Krueger assumes the variable related to computer use can be considered a measure of computer skills (DiNardo and Pischke, 1997, pp. 300-303), but the data on pencil use demonstrate that this assumption is not valid: around 60 per cent of German workers use pencils but around 99 per cent have writing skills. Writing is obviously not a scarce skill and, as such, should not command a wage premium. The observed premium in wage regression analysis must therefore reflect other selection processes. Similarly, the wage premium for computer users may reflect other unobserved skills or attributes, which do not reflect the level of computer skill.

Major weaknesses can thus be identified in the methodologies used in studies which have generated the polarization thesis. The problem lies, in part, with the failure to establish a theoretical analysis of the relationship between technological change and individual skills. Instead, as with all econometric analysis, a correlation is established, and the direction and dynamics of causation assumed. Similar problems are also found among sociological studies, where the use of econometric analysis is now common. For example, Gallie et al. (1998) find that individuals using advanced technology in the United Kingdom were more likely to experience increases in skill and responsibility than non-users, and this finding holds true when the sample is divided across five different occupational classes (op. cit., table 2.5). Again, this method assumes an unobserved causal relationship between computer use and upskilling. Other "unobservables" associated with the observed upskilling may include increased investment in firm-specific skills or strengthened bargaining power (Levine, O'Shaughnessy and Cappelli, 1999).[5]

One of the difficulties with the debate arises from how upskilling is measured in large-scale surveys of workers. Clearly, there are general problems with the concept of skill (Spenner, 1990; Vallas, 1990), but these problems are compounded by surveys which treat an employee's perception of skill change as indicative of changes in the nature of their work. An employee with five years' experience in a particular job is highly likely to have personally experienced an increase in her or his skill on that job. Similarly, use of new technologies that require new skills is likely to be equated

[4] In each case, DiNardo and Pischke (1997) control for the possibility that the "dummies" (use of a pencil, use of a telephone, etc.) may be proxies for use of a computer. In contrast, working with "blue-collar" tools — such as a hammer, a screwdriver or a paintbrush — is associated with a wage penalty of 9 to 11 per cent.

[5] More robust findings may be generated from use of industry- and plant-level data-sets (for a review, see Brown and Campbell, 1999). For example, one recent study shows that between 30 and 50 per cent of the increase in demand for skilled workers may be due to computer technology (Autor, Katz and Krueger, 1998). Nevertheless, the study relies on general proxies for technological change — such as research-and-development intensity or accounting equipment — which may be biased towards particular sectors of economic activity.

with upskilling rather than downgrading or deskilling. These perceptions are valid, but do not necessarily imply a change in some absolute level of skill required in that form of work. In fact, case study analysis suggests that the experience of "upskilling" associated with ICTs may go hand-in-hand with a deterioration in other indicators of job quality such as the degree of discretion and autonomy and the range of job tasks. For example, a number of studies argue that implementation of new technologies is highly contingent upon the gendered structuring of the labour market (Wacjman, 1991; Webster, 1996). The findings of the survey by Gallie et al. (1998) lend support to this argument. These show that while both male and female users of advanced technology were more likely to believe they had experienced skill increases than non-users, for women use of technology was not associated with higher levels of task discretion and job responsibility, as was the case for men (op. cit., pp. 49-50). Moreover, while the simple binary model of the mainstream literature assumes a match between the changing proportions of high-skill and low-skill workers, on the one hand, and patterns of use and non-use of advanced technologies, on the other, case study research demonstrates the possibility that there may be both winners and losers among users of ICTs.

At the level of the organization, the impact of ICTs on skills is shaped by associated changes in employment policies and practices (Grimshaw et al., 1999). For example, where employers are keen to improve recruitment and retention among workers they may introduce ICTs alongside costly programmes of multiskilling and a genuine effort to enhance worker skills and enrich job design. Conversely, other employers may be keen to design ICT systems in a way that allows them to monitor worker effort and the quality of job tasks. One technique is to require workers to follow "scripts" that are encoded into computer systems, thereby removing worker discretion and restricting possibilities for skill development. Similar forms of ICTs may thus have contrasting implications for skill development in different organizations.

Moreover, simultaneous transformations in the nature of work and employment mean that, for many organizations, the issues associated with the development of ICTs may be concerned less with how to improve technical skills and more with how to adapt workforce attitudes to the rapidly changing pace and nature of work. As Miozzo and Ramirez (2000) argue, employer goals of upskilling may be complicated by ulterior motives to exploit the weak bargaining position of workers, particularly in the context of a transformed industrial relations landscape. In a case study of a large telecommunications company based in the United Kingdom, one manager talked about the skills development approach associated with new ICT systems:

> You've got a completely new technology that people have never seen. … The key is adaptability to change and these are more general skills. In this sense, sometimes 'inside people' are often stuck in a rut. They are thinking of designs along lines of the past. I need high skilled staff. So I'm forced to go outside ... I could re-train, but I need some new attitudes. ... I need adaptable people with positive attitudes. Some of the staff here

> have the wrong attitude. ... I need flexibility, adaptability and excitement by new technology. A lot of people around here are distrustful of new technology; they wish it would just go away (cited in Miozzo and Ramirez, 2000).

In fact, the balance of bargaining power between employer and employee is critical in shaping the impact of ICTs on skills. Analyses need to recognize the interdependence of ICTs, bargaining structure and other institutional and economic changes in the employment system. Institutional economic analysis that focuses on agency and bargaining provides some insight here (Guy 2000). According to this approach, ICTs may act as a pressure towards delinking the process of upskilling from improvements in job quality. There are two reasons for this. First, the bargaining position of workers using ICTs in a networked organization is considerably weakened by the ability of the "core" firm to restructure continuously, changing both its internal organizational focus and its external relationships. This reduces the relative bargaining strength of workers in the "network" firm as all workforce groups are vulnerable to being shifted from core to non-core status. This diminishes the likelihood that upskilling might lead — through negotiations — to higher remuneration, for example. Second, the fragmentation of the large, bureaucratic organization may lead to variations in the rents paid to workers since certain parts of the new "disintegrated" organization will enjoy greater market power than others. Here, although all segments of the network organization may utilize the same technologies, and thus share similar skills, the returns may be distributed unevenly between core and peripheral sites. In an explicit attempt to disentangle the links between pay, skill and new technologies, Guy draws the following conclusions:

> What produces a new class of low-paid workers in the information economy is not a lack of skill in the new information technologies. The low-paid jobs use just those technologies, but are on the wrong end of it. Organisations based on older information technologies, by their limited capacity to specify, monitor and adjust the plan, required solidaristic institutions in order to function well. The new technology drives people apart (2000, p. 15).

Overall, the evidence from case-study analysis suggests that to understand the changing pattern of skill demand associated with ICTs, research needs to identify the interrelated roles of organizational structure, bargaining position and employer strategy. Large-scale data analysis of the relationship between ICTs and skills often fails to draw out these links. Technological change needs to be treated as an endogenous and contingent variable, not as an independent given; and pay levels need to be disentangled from measures of skill to allow analysis of how variations in the relationship between skills and bargaining power occur across organizations. Indeed, upskilling and deskilling tendencies need to be understood in the context of interrelated changes in job prospects — including pay and other dimensions of job quality — so that a more balanced assessment of the costs and benefits of skill-biased technological change can be made.

Boundary-less careers and fragmented organizational structures

Internal and external restructuring of organizations has dismantled traditional ties between the employer and the worker and led to changes in the pattern of career structures. This section assesses the extent to which such changes represent opportunities for the employer to displace risk or opportunities for the worker to acquire broader work experience and develop new skills.

Internal restructuring

A number of studies argue that the internal restructuring of organizations complements changes in ICTs. For example, the "delayering" of job hierarchies is said to improve communications among staff by reducing the number of workforce layers between shop-floor staff and senior management (for a review, see Harrison, 1994; McGovern, Hope-Hailey and Stiles, 1998; Purcell and Hutchinson, 1996). Vertical hierarchies of management are thus replaced by horizontal layers of coordination, facilitated by ICTs, where workers at different levels rely on teamworking, collaboration and the interchange of ideas and information (Despres and Hiltrop, 1995; Frenkel et al., 1995). While the apparent efficiency gains of such practices are debatable (Delbridge, 1998; Thompson and Warhurst, 1998), they have a number of important implications for career structures.

The usual image of the delayered organization is that of a flattened structure, as the traditional pyramidal shape is whittled down in size. However, a very different shape may also emerge — that of a hollowed-out pyramid, since the removal of middle layers may open up a gap in the internal job structure. Where this happens, such a gap can potentially undermine the linkage between training and career advancement, both by increasing the organizational costs of formal training and by reducing the likelihood of informal on-the-job training being seen as the basis for promotion to the next level (Grimshaw et al., 1999). The effect is to increase the incentives for managers "to buy" rather than "to make" skills to fill high-level positions.

For those groups of workers who are mobile among the upper rungs of organizational job ladders — Reich's (1991) "symbolic analysts" or knowledge workers — delayering thus appears to open up new opportunities to accumulate knowledge and broaden experience as part of a "portfolio career". For these workers the goal is to move towards "the centre of an occupational community rather than the pinnacle of an organization" (Barley, 1996, p. 47, cited in Warhurst and Thompson, 1998). However, delayering perhaps has its most radical impact on workers employed on the lower rungs of an organization, Reich's "routine production workers" and "in-person service workers". For these workers, the degree to which the "skills gap" within the delayered organization penalizes their career prospects depends on three factors.

First, the greater the firm-specificity of skills acquired by workers, the weaker their prospects for external career mobility. Thus, in a labour market

where there is no coordination of the training or job ladders across organizations, opportunities for workers to enhance their career prospects through external mobility may be highly constrained (Crouch, 1997). Second, the concept of "employability" tends to be regarded as independent of the conditions of the external labour market (see also Sengenberger, 1981). The rate of unemployment tends to be higher among workers with low levels of education than it is among more educated workers, suggesting more constrained external opportunities for career mobility. Third, traditional notions of internal career prospects may be replaced by alternative organizational arrangements that establish a new sense of loyalty to business goals. For example, employers may seek to improve workers' perception of job quality through "empowerment" rather than through traditional programmes of skills acquisition. In the wake of delayering policies, workers are encouraged to acquire the disciplines of self-management, individual responsibility and new problem-solving techniques; a focus on the objective of "self-realization" is intended to enhance both the productivity of employees as workers and their commitment to business goals as individuals (Champy, 1995; Kanter, 1989; see also Du Gay, 2000, for a review). But there is considerable scepticism regarding this new agenda of "winning hearts", or "mobilizing subjectivity". Rather than job enhancement, employees are more likely to experience adverse "normative controls" on their personality at work. For example, the employer may prescribe new "skills" needed to become a team player in the delayered organization, such as cooperativeness and positive attitudes. However, these may be interpreted by the employee as just another management strategy designed to increase work effort (Warhurst and Thompson, 1998).

External restructuring

ICTs also enable organizations to restructure their operations externally across a network of firms through arrangements which include subcontracting, outsourcing and partnerships. The literature has focused primarily on the implications for production efficiency (for a reader, see Buckley and Michie, 1996) and the role of trust in interorganizational contractual relations (see Lane and Bachmann, 1998). But these changes in organizational structure also raise important questions for workers' careers (Hirsch and Shanley, 1996). For example, as "non-core" activities are externalized, it might be expected that career structures for "core" workers within the organization are strengthened. The difficulty here is that the definition of "core" is highly contingent upon the character of external pressures and conditions (as well as management fads and the tendency for mimicry of apparent "best practice"). Thus the "core functions" of an organization are likely to be in a permanent state of flux, which diminishes the security even of so-called "core" workers.

There is also the issue of sunk investments and irreversibility. A worker may have embarked on a "bounded" career path, which involved a large sunk-cost investment (in time and expenditure). A shift in organizational structure is thus particularly problematic for workers with several years'

experience for whom career investments may be irreversible and new job opportunities in partner firms, or with subcontractors, may be limited. Thus, even where they do succeed in finding new employment, older workers may have difficulty finding new users of their firm-specific skills and knowledge, and may be forced to accept lower rates of pay if those skills are not recognized or required. The issue of sunk costs may be less serious for new entrants to the labour market, although this is contingent upon the national system of education and training. Countries that depend upon coordinated occupational/vocational training systems (such as Germany's apprenticeship system) are unlikely to substitute new generic learning principles of problem-solving, analytical reasoning and networking skills for the content of apprenticeship programmes dedicated to particular occupational skills. At the same time, however, the uncertainty of organizational transformation and the way skills are utilized may reduce the supply of applicants to highly structured training programmes.

A further problem concerns the general difficulties of career planning in a context of greater uncertainty as large organizations "downsize" and farm out activities to other firms or to individuals on temporary contracts. Within the organization, the continuous shifting between "core" and "periphery" functions has collapsed conventional rules and norms governing job security, as well as the principles regarding promotion and dismissal. Also, for workers contemplating building a "network" career, conditions in the external environment are no less uncertain. Whether they are based on internal or external mobility, investment decisions are likely to involve very little information about the future state of the network organization; the constant state of flux makes rational decision-making futile (Lash and Urry, 1987).

Overall, the implications of new organizational forms for careers are likely to depend on the economic and institutional context. This includes the general conditions of the labour market, the industrial relations system and the education and training system. While ICTs may well be an important lever in facilitating current transformations away from the large, hierarchically structured organization, employers are not solely interested in tapping into external pools of specialist skills, or in the gains from contracting through new forms of codified know-how. In some cases, a more important factor may be the capacity for employers to reorganize activities in a way that allows them to discard the historical baggage of powerful trade unions that have negotiated decent terms and conditions within many large organizations (Bosch, Webster and Weißbach, 2000). New job opportunities arising in the context of downsizing and delayering are therefore likely to reflect the cost-cutting goals of employers. Whereas in the past, moves from one organization to another were likely to be associated with improved rates of pay as workers sought better career opportunities, the contemporary pattern is just as likely to be associated with an erosion of terms and conditions as many workers are forced to seek alternative employment in less protected segments of the network organization.

Concluding remarks

ICTs represent both a threat to and an opportunity for the development of job quality. What is clear is that if the opportunities are to be seized, there will need to be an intensive stage of building and rebuilding labour market systems and institutions to provide the framework within which job quality and indeed decent work can flourish. While the pessimistic scenarios concerning ICTs tend to obscure the many benefits which can be derived from the application of new technologies, the literature associated with the more optimistic scenarios often makes the assumption that the beneficial effects will arise automatically, provided that ICTs are embraced enthusiastically and without barriers. The likely future will include elements from both the pessimistic and the optimistic scenarios, with different impacts felt by different groups and by different parts of the globe.

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