

## Overview

The *World Employment Report 2001* examines the impact of the new information and communication technologies on life at work at a time when the global employment situation still remains of considerable concern. While there have been some significant positive developments, especially in the United States and some industrialized countries, in most parts of the world the growth of new employment opportunities still remains insufficient to productively employ those who have lost jobs due to restructuring and the new entrants into the labour force.

The ILO estimates that at the end of 2000 some 160 million workers are unemployed, most of them first-time jobseekers. Unemployment rates among young workers are almost everywhere at least twice as high as the average. Of these 160 million unemployed workers, about 50 million are in the industrialized countries, including Central and Eastern Europe.

In addition about 500 million workers are unable to earn enough to keep their families above the US\$ 1 a day poverty line.<sup>1</sup> These are almost entirely in the developing world. And of the workers who are not among the poor, many lack basic job and income security. There is reason to believe that the numbers in this group are growing in many parts of the world.

Over the next ten years, although the growth rate of the world's labour force will slow down, there will be still some 460 million new, young jobseekers. Only 3 per cent of them will be in all parts of Europe and North America. Two-thirds will be in Asia. Fewer than earlier projected will be in Africa because the HIV/AIDS epidemic is having a disastrous impact on the economy and the labour market. In the longer run, the most serious problem will be the loss of human capital caused by HIV infection. Losses are disproportionately high among skilled, professional and managerial workers. The epidemic will not only reduce the stock of such workers, but also reduce the capacity to maintain future flows of trained people.

The prospects for an improving global employment situation will depend mainly on whether the current expansion of the world economy can be expected to continue. There are many uncertainties, including the trajectory of the US economy (towards a hard or soft landing), the possibility of Europe taking over as the global economy's dynamo, the sustainability of Russia's upturn and India's ability to maintain its high economic growth momentum.

On balance, while there are many uncertainties, overall recent developments present a favourable set of prospects for the world economy. Growth in itself will provide jobs of a kind to the new entrants and may contribute to a reduction of the unemployment rate. But that is not enough. Growth cannot in itself be expected to ensure that the needed 500 million jobs are of sufficient quality to bring all the world's workers closer to the enjoyment of decent work. To achieve this requires much greater attention to core labour market issues, including investments in human capital, overcoming discrimination and making employment a central goal of economic policy. Turning now to the report's thematic section, the diffusion and use of information and communication technologies will clearly have major, if at this stage, indeterminate impacts on global employment in the years to come.

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<sup>1</sup> Note that the poverty line is in purchasing power parity (PPP) dollars at 1985 prices.

## **Life at work in the information economy**

The digital convergence of information and communication technologies (ICT) has lessened two long-standing obstacles to communication - delay and distance. Ever cheaper, ever more rapid, and ever more varied means of communicating vast amounts of information through the Internet, among other networks, is creating a world in which there is far greater access to information than ever before. Is a "new economy" emerging?

ICT is making access to information more symmetrical - more people have access to more information whenever and wherever they need it - and this is disrupting established economic relations. The effect will be profound changes in the structure of markets and organizations and established patterns of economic behaviour. While much attention has surrounded the volatile new world of the "dot.coms", this is a distraction: the true portent of ICT is how it will transform the "old economy".

Changes in how the economy works will transform the world of work. The creation and loss of jobs, the content and quality of work, the location of work, the nature of the employment contract, the skills required and how often they can be obtained, the organization of work and the functioning and effectiveness of worker and employer organizations - all are affected by the emerging era of digital globalization.

Knowledge workers, those who generate ideas and transmit these electronically as "intangible" or "immaterial" products, gain particular advantage in the networking economy: through the Internet and other networking technologies, they have access any time to unlimited amounts of the "raw material" of knowledge creation. Yet there is a knowledge component to all work, and the illiterate farmer can also gain from greater access to information. Nor does networking necessarily mean an increase in knowledge or skill requirements. Unskilled or de-skilled jobs - skill polarization - in the networking economy also exist.

## **Irreversibility and speed**

ICT is a "meta-technology" characterized by pervasive effects on the economy as a whole, and on areas of scientific and technological advance well beyond the ICT sector itself. Barring a disaster scenario, the onrush of information itself is irreversible; however, its course is by no means pre-ordained or pre-determined. This will clearly be a "steerable revolution", in which wise policies and appropriate institutions will be essential toward directing change toward the greatest public good. Passivity will lead to marginalization.

Periods of rapid technological change give rise to innovation and creativity, the outcomes of which cannot be known in advance. One effect of the technologies is clear: work is becoming independent of location - and this will change management practices, the nature of the employment contract, and the quality of work. Also, the ability to organize production in "real time" anywhere in the world will no doubt induce changing patterns in the global division of labour.

The digital era has diffused at an astonishing rate. Fifty million people were navigating the Internet within its first four years and their numbers are increasing at a rapid rate. But speed also means disruption and division. Disruption occurs as the inadequacies of existing institutions and regulatory frameworks are exposed to rapid change and new demands. Institutions and

organizations that do not adjust risk irrelevance. Technological change always favours the prepared: the world's different speeds of change and different stages of preparedness mean that the existing "digital divides" are certain to widen.

## **A widening digital divide**

Within countries, the digital divide often has common characteristics. Use of the Internet, for example, is more common among younger than older people, men than women, the more rather than the less educated, urban rather than rural dwellers, and those with higher incomes. One, if not the most significant factor is the level of education, as education itself is related to income and often to location. Girls lag in educational attainment in most countries and, even in wealthy ones, their enrolment in the core courses of the technologies is a small share of boys' enrolment.

Between countries, the divide's features also have common characteristics. Barely 6 per cent of the world's people have ever logged onto the Internet - and 85 to 90 per cent of them are in the industrialized countries. The level of national income is strongly related to ICT diffusion and is clearly the distinguishing feature of the divide between industrialized and developing countries. The cost and availability of telecommunications determines the extent to which the Internet is used, and per capita access costs are most often higher in poorer countries. Coercive governments limit the extent to which information is exchanged, and evidence shows a higher level of Internet usage where political and civil freedoms exist.

## **How will markets be affected?**

Macro-policies and features of the regulatory environment have a determining influence on the degree to which enterprises will adopt new technologies, how they will use them, and whether new enterprises will be created. In general terms, however, it is the incentives that the technologies create at the micro-level - and the strong pressure of competition - that will directly determine the economic and employment effects of ICT.

Using ICT lowers costs and can increase productivity economy-wide, including in "old economy" industries. As costs are lowered throughout the economy, some believe that a "new economy" will emerge - one characterized by a higher level of potential growth consistent with low inflation. The most that can be said at present is the appearance of a few hopeful signs surrounding the changing price relations associated with ICT. Available evidence does show that electronic markets are more transparent and, through lower transaction costs, appear to result in substantial changes in established price relations. For example, some evidence shows that electronic markets can result in up to 15 per cent lower costs for consumers. It is far more significant that lower costs are also apparent in inter-enterprise or "B2B" transactions across many "old economy" industries. The ICT sector itself is the fastest-growing sector in many industrialized countries. Although the ICT sector usually does not account for much more than 5 per cent of the workforce in any OECD country, the sector's contribution to GDP growth is disproportionately great.

## **How will work organization be affected?**

Globalization had already spurred an internal transformation of the enterprise, resulting in changes in the organization of work toward flatter hierarchies and project-based teams. The need for a more rapid response to volatile product markets and declining product life cycles has also been behind the trend toward greater outsourcing. The emerging era of “digital globalization“ is accelerating these organizational changes. Enterprises in the most globally competitive industries have experienced both a decline in the time devoted to strategy formulation and a qualitative change in the nature of competitive advantage. “Time-to-market“ has arisen as a critical competitive asset. This in turn compels companies to rely on the creativity, knowledge, and ability to acquire new knowledge of their core employees.

Evidence shows that major gains in enterprise performance only occur where the use of the new technologies has been combined with wide-ranging changes in work organization. Evidence also shows that the most widespread use of the new technologies exists in enterprises that have adopted the most thorough range of work organization changes, such as the decentralization of decision-making, and the organization of work into semi-autonomous, task-oriented teams.

The fast pace of competition means that, for some highly skilled activities, companies are relying on the external labour market for inputs of temporary duration. The technologies, meanwhile, allow companies to source work independently of location. The outsourcing of needed inputs is accelerated both by the enabling technologies, as well as by competitive pressures. Locations (in both industrialized and developing countries) that have the adequate infrastructure and skills in their labour markets can benefit by participation in new global value chains, in “intangible“ product markets such as software development or data processing.

The convergence of “carrier“ and “content“ industries has resulted in mergers between large firms. At the same time, there are lower barriers to entry in a period of rapidly evolving technologies, in which creativity and innovation matter more than physical plant, physical raw materials, and investment capital. Business start-ups are on the rise.

## **Potential, but not without risk**

A world economy integrated in real time carries with it both advantages and new sources of instability. For example, the fortunes of Internet firms and the remuneration of at least some of their workers are unusually dependent on volatile equity markets. Capital markets, meanwhile - the most integrated global markets of all through ICT - have already proven their ability in recent years to be contributing sources of massive job destruction.

It is also true that value chains integrated in real time create dependencies that, in turn, increase vulnerability to disruption at any stage in the chain. On the one hand, this could prove destabilizing as natural or human-made disturbances anywhere at any one point in a highly integrated chain could have immediate repercussions elsewhere. On the other, another effect of this could well be to increase the leverage that workers and their organizations could bring to bear on the enterprise that employs them.

Finally, a higher level of integration between some developing country locations and industrialized countries could increase the relative exclusion of locations that are not connected. This is another reason why appropriate policies at both international and national levels -

involving both the public and private sectors - will be necessary for increasing the gains arising from the use of the technologies.

## **Will the information economy be a jobs economy?**

The report is guardedly optimistic on the chances for employment growth where ICT is most in use. Productivity growth is greatest in the core ICT sector itself, where, in manufacturing it has resulted in stunning increases in output with nevertheless declining employment. But the employment decline in manufacturing has been more than offset by the rapid growth of new markets and new employment in the service sector, with business and producer services and social services (health, education) claiming the highest share of growth. In France, for example, evidence shows that the negative effects of labour-saving investments in ICT in manufacturing have been largely compensated by job growth in services, business services in particular.

Evidence shows that the countries that have had the greatest growth in total factor productivity“ in the 1990s are those where ICT has been used most widely in the economy. These are also the countries in which employment has grown the most. There is evidence that employment ratios are highest in those countries where the use of ICT is most widespread. Evidence also shows that unemployment has declined most in the small number of countries where Internet use is most widespread, such as Denmark, Finland and Ireland. It is too early to conclude, but there are hopeful signs that the effect of ICT on employment is positive.

Use of the technologies is nevertheless associated with new patterns of job creation and job loss. And despite the hopeful signs of employment creation, it is clear that jobs will also be lost through three main channels - obsolescence, automation, and disintermediation“.

ICT replaces old tasks and occupations through automation, such as the telephone switchboard operator. But the technologies also create new tasks and occupations, such as Webpage designers or call-centre workers or a variety of new intermediaries. Consensus reigns on the fact that the highest rates of job creation, job destruction, and job switching occur among the most technologically innovative firms in sectors where overall employment is growing. More generally, ICT creates jobs for occupations in rising demand, such as software programmers, while destroys jobs in those skills in declining demand, such as those associated with analog technologies. Since ICT enables routine tasks to be “codified“ and automated as part of the labour-saving increases in productivity that arise with the use of ICT - this, of course, is a source of job loss. Some jobs based on information intermediation - travel agents, for example - could be lost through more direct access to information or change in function.

## **Diversity, but also signs of stability in the labour market**

Through the Internet and email, when work is independent of location, new ways of working arise. There has been a rise in self-employment. A growing number of “freelancers“ move from enterprise to enterprise or project to project on their own, sometimes for months, sometimes for days. In labour markets that are at the forefront of the digital economy, such as Silicon Valley, the share of self-employed and temporary workers is far higher than the national average. The skill levels and value to the firm of these individuals are high, but the firm specificity of their knowledge is low. In consequence, diversity is increasing in those labour markets where ICT has diffused the most. Although disaggregated data are unavailable, the share of self-employed, temporary and part-time work has been rising in most OECD countries.

The margin of the digital workforce that is mobile has needs that both the reform of existing labour market institutions and the growth of new ones can address. Both public and private employment agencies are extending their range of services beyond the job-matching function to the additional needs of a mobile workforce. While there is substantial variety in the agency work industry, the most advanced companies are not only major providers of career continuity for their temporary workforce, but also providers of skills as well. Trade unions and employer organizations are also offering services to these new independent workers.

The theory that labour markets in the digital era are undergoing profound transformation has some basis in truth. For most people at work, however, there continues to be a surprisingly high degree of employment stability. In 12 out of 16 OECD countries' labour markets examined in this report, job tenure, a measure of employment stability, has either remained unchanged during the last decade of the 1990s, or had in fact increased. Even looking more closely at some of the occupations most associated with the New economy, such as telecommunications workers or those in the distribution sector, job tenure has remained largely unchanged.

Continued employment stability despite an era of fast-paced technological change is not an unreasonable expectation for at least two reasons. First, and as noted earlier, the OECD labour market is ageing. Job tenure always increases with the age of the workforce. A second reason may relate to how ICT and globalization are affecting competitive advantage. As "time-to-market" becomes increasingly important, the organization of work needs to adjust so that a high degree of creativity and a more rapid response to product market pressures can occur. Critical to the new organization of work is the increased need to "tap" the tacit knowledge of the workforce. To do so requires a workplace culture in which trust and experimentation can simultaneously occur. Such behaviours are unlikely to occur between relative strangers in workplaces characterized by a high degree of instability and frequent turnover.

Employment stability is no indication of the absence of change. Labour markets have indeed become more demanding, more diversified, and more turbulent. But most of this turbulence is being internalized with the enterprise, where jobs are indeed changing. Nor does employment stability mean employment security: contracts are changing, stress is on the rise, and this report cites evidence of employment insecurity perceived by workers up and down the organizational hierarchy.

## **The spatial distribution of employment**

The report places considerable emphasis on the independence of work from any physical location. This is a feature of teleworking from home, but it also refers to the relocation of jobs from industrialized to developing countries, such as "back-office" staff located in call centres, data entry and processing, software development. Work that is independent of location has a growing share of employment in industrialized countries. For example, almost one-fourth of the workforce in the United Kingdom now carries out at least some of its work at home. By 2003, there will be an estimated 1.3 million employed in call centres in the European Union, up from an estimated 670,000 in 2001.

Women are often thought to benefit from the new independence of work location. In some ways, this is clearly the case: working from home, for example, can allow a better accommodation of work and family schedules. But isolation and exclusion from career choices can also occur. Women tend less than men to mix telework with stays at the office. Nor is women's telework as

mobile as men's, but concentrated at home. At home, women are more likely to combine telework with family responsibilities, whereas men are more likely to separate the two. Call centres and data processing in developing countries are predominantly female occupations. But data processing, although it may be better than other local labour market alternatives, may not lead to career upgrading. And wages and conditions of work in call centres appear to vary widely. In the best, a new, more informal and more appealing work culture may be apparent; but, in the worst instances, call centres have been called the "sweatshops of the digital era".

One estimate suggests that up to 5 per cent of all service-sector jobs in industrialized countries could be "contestable" by developing countries. This would amount to about 12 million jobs in which relocation to developing countries could occur. For example, in the Caribbean countries, almost 5,000 women were employed in data processing activities in the late 1990s. Such jobs can provide developing countries with an important toehold in global export markets, as well as providing direct employment and foreign exchange earnings. But if the magnitude of the relocation of work is a credible estimate, it implies that the greatest employment potential of ICT for developing countries needs to lie elsewhere.

Beyond participation in global value chains through the increasing tradability of services, the technologies offer the chance for purely domestic activities and associated job growth. Through telecentres, for example, countries such as Bangladesh, India and Senegal and others have been able to create direct employment for thousands of women and men. Over the last four years in India, for example, an estimated 250,000 jobs for women have been created through mobile telephony centres. Such local entrepreneurial activities are likely to have positive externalities on local economies as well. Evidence also shows that women's operation of telecentres increases the participation of women as consumers of these services.

## **The chances for development**

It is clear that ICT is merely a tool, and tools do not substitute for genuine development. ICT, however, offer tools that may accelerate development. Since the principal consequence of ICT is greater access to and use of information, it is precisely those locations that have the least of both where the technologies could have the greatest marginal impact. Telecommunications are positively correlated with economic growth. Even mobile telephony can be a stimulus to local economic development and, in causal terms, some evidence shows that better telecommunications are likely to be a source of economic growth. A widening digital divide may be inevitable, but using the technologies can be beneficial at any level of economic development. The potential welfare gains for developing countries are of three major types.

First, countries with the right mix of skills, infrastructure, and policies could become important locations in global markets for intangible products or ICT products generally. Countries as diverse as Brazil, China, Costa Rica, Israel, Malaysia and Romania have all been able to gain niches in such markets. Some commonalities underlie their success. It is clear, for example, that for maximum gains to emerge, the development of essential ICT skills, including software development, is necessary. Without such skills, the technologies can neither be maintained nor adapted to local usages, from which greater economic advantages are obtained.

Second, acceleration of development can occur through the leapfrogging potentials inherent in the technologies, where leapfrogging is defined as the ability to bypass earlier investments in the time or cost of development. Leapfrogging has first of all a technological foundation: through wireless applications, developing countries can bypass more costly and time-consuming

investments in fixed-wire telecom infrastructures.

In economic terms, leapfrogging can occur through several channels. For example, developing countries have often gained an initial niche in export markets through comparative advantage in cheap, unskilled labour, as is characteristic of the garment industry. Where appropriate skills are available, countries can now bypass this earlier, lower value-added entrance into global markets in favour of greater value-added production. An example is Costa Rica, where the educational level of the workforce was a vital factor in Intel's decision to locate a semiconductor production facility.

Small enterprises in developing countries have at least potential access to a global market for both tangible and intangible products. For example, pockets of software development are now occurring in the Philippines and in Viet Nam for clients identified through the Internet. For tangible products, provided that the physical infrastructure is adequate enough for the fulfilment of transactions to occur, countries can find markets for goods in which they have an unassailable competitive advantage, such as products made locally or cultural artefacts. In many cases, leapfrogging refers to advantages at the microeconomic level. For macroeconomic gains to occur requires a range of commercial, trade, investment, telecommunications and other infrastructure policies to be brought to bear on the development potential of ICT. China's strategy is particularly promising in this regard. It has combined previously separate ministries into the Ministry of Information Industries, and established economic zones particularly devoted to the growth of start-up ICT ventures

The third welfare gain that could underpin a new development paradigm arises from the possibilities that networking opens up for poverty alleviation. To the extent that ICT can improve aggregate economic growth, this could generate linkages to activities that provide livelihoods for those who are poor. Poor people could also benefit directly through access to the information that the technologies provide - or through the potential for greater collective voice and empowerment they allow. Finally, to the extent that the technologies can make governments more transparent, extend their services more broadly, and at lower cost, the poor could benefit from the improved quality and reach of health, education and social services. This could also create opportunities for women through access to learning, incomes, and greater autonomy. Access to ICT for poor segments of the population is likeliest to occur at the community level. A key focus for expanding such access could be through the improvement of NGO capacities and other local development agencies in, for example, the fields of health care, child welfare, or basic education or nutrition.

## **Education matters most of all**

The report emphasizes that literacy and education cannot be leapfrogged, yet both are vital for reaping the greatest advantages from the emerging digital era. The promotion of education and literacy generally, and digital literacy in particular, is a challenge facing all countries. Educational differences underlie the different rates of penetration of ICT and Internet usage. For example, the ICT world is often depicted as a world of relatively young men, and the available evidence supports this depiction. Two-thirds of the world's illiterate are girls and women. Nor are girls sufficiently enrolled in the science curricula at the core of the technologies' innovation and use.

In the wealthiest countries, substantial progress has been made in ensuring access to the Internet in schoolrooms. The European Union's programme, for example, is for 100 per cent "connectivity" in schools by the end of 2001. Access alone is insufficient: teachers need to be



trained in the substance of the new technologies and their most effective use. Even in the wealthiest countries, such training is far from thorough, and investments in the pursuit of this objective are often minimal. Obviously, for the majority of the world's people, this objective is distant from reality. In the poorest countries, the main objectives need to continue to be the promotion of literacy and access to general education.

Poorly equipped schools or their absence altogether are most characteristic of the poorest locations. Through their application to distance-learning, the technologies could greatly multiply access to learning opportunities for those who most need them. Distance learning applications, while costly to develop, have low unit costs the more there are people who use them. In such locations, distance learning can be an important complement to existing education providers.

### **Lifelong learning in schools, first, and then at work**

Wealth creation in the wealthiest countries relies less on physical inputs than on knowledge. The frontiers of knowledge itself, however, are rapidly expanding. Two consequences of this are, first, a shift in teaching methodologies away from the transfer of facts to students as passive recipients, and, instead, towards teaching students how to learn and instilling in them the curiosity to do so. In short, how people learn is becoming as important as what they learn. A parallel trend is observable in high tech firms exposed to fast-paced competition. The ability to learn, to transform existing knowledge into new knowledge, is a source of competitive advantage of increasing significance. In such companies, daily learning has become an integral part of the job. Part of such learning relies on the exchange of tacit knowledge among employees.

The adoption of ICT in enterprises is creating two types of skill needs. The first relates to a variety of foundation skills, such as the ability to learn, to communicate, and to analyse and solve problems, all of which are essential to work environments that rely on rapid innovation, and the interpersonal exchange and creation of knowledge. Beyond such skills, however, are the technical skills related to ICT itself, the need for which extends well beyond the ICT sector to the economy as a whole.

Where the technologies are most broadly in use, skill shortages - particularly in the technical support skills surrounding both hardware and software applications - are acute, if difficult to quantify. This, in turn, is a brake on economic growth for enterprises that would otherwise adopt the technologies' applications more readily. Three problems relating to the skills shortage are of particular significance. The first of these is the debate over labour migration. The availability of technical skills in developing countries could be used to meet the skill needs of industrialized countries. On the positive side, migrant workers benefit from the greater experience and higher wages that migration can bring, and sending countries can benefit from the remittances their expatriates send home. It is also true that countries such as China, India and Viet Nam have all benefited from the networks their expatriates have created outside the country, and also from the skills and experiences they repatriate when they do return home. For receiving countries, of course, reliance on foreign labour is a way of overcoming skill shortages in the short term.

On the negative side, however, the outward migration of the technically skilled can result in a brain drain, depriving developing countries of these scarce skills. For example, possibly all of India's annual graduates in ICT-related core skills could be in demand in industrialized countries. For receiving countries, meanwhile, there are two problems. First, some evidence suggests that the attractiveness of skilled migrant labour in the United States comes from the lower pay that employers can offer them relative to domestic labour. Additionally, there is concern in both the

United States as well as in European Union countries that recourse to foreign labour might detract from the need for the training and retraining of the existing workforce. This is particularly the case where emerging skill shortages coexist with still relatively high unemployment.

A second and related problem is the ageing workforce in many OECD countries. This implies, first of all, that the majority of “tomorrow’s workforce“ is, in fact, already on the job. The promotion of lifelong learning and the retraining of the existing workforce need therefore to be policy objectives applied to those already at work. Equipping workers with ICT-related skills, therefore, will need to be specifically targeted to the needs of older workers.

A third problem is the possibility of a skills polarization emerging as the technologies are taken up by enterprises. On the high end, highly skilled workers using ICT-related skills intensively on the job may have broad career options and command high salaries. But there remain many jobs in the networking economy that are low-skilled and low-paid. The polarization of skills could also reinforce the gender-based segmentation of the labour market.

There are many avenues available to address the greater need for retraining and lifelong learning. Both feature prominently in enterprise training policies, as well as in the strategies of trade unions, and access to learning opportunities increasingly features in national tripartite agreements or at the collective bargaining table. In Singapore, for example, the Critical Enabling Skills Training (CREST) programme will enrol 100,000 trainees in 2001. Germany’s tripartite Alliance for Jobs agreed on the creation of training places for 60,000 people in ICT up to 2003. In South Africa, a tripartite training authority in the ICT sector specifically was set up in 2000.

Addressing the skills shortage has resulted in new ways in which training is delivered and new deliverers of that training. Distance-learning is a valuable substitute for classroom instruction. For example, multinational enterprises are increasingly using distance learning applications for their staff worldwide: in an environment of rapid change, lifelong learning has become critical to corporate success, as well as to the employability of workers. Classrooms are a poor substitute for learning vehicles that can be used anywhere, anytime, such as distance-learning. Evidence also suggests that interactive, multimedia formats can often be a more effective means of knowledge retention than classroom lectures. To remedy a worldwide shortage of skills in ICT makes good economic sense and will require both an innovative new range of public/private partnerships as well as investments of human and financial resources.

## **How will the quality of work and life be affected?**

Will the quality of work and life improve? The networking economy offers genuine potential for striking a better balance between work and family responsibilities, or work and leisure. Work itself has become more rewarding for many in its pay and in its content. The creation and use of knowledge on the job can be inherently more satisfying than the monotony of narrow tasks performed under strict supervision. The independence of work from its location can be liberating not only in spatial terms, but also in the ability to schedule work when desired. The increasing knowledge content of work should favour the equality of women and men in the workforce. Intelligence and creativity are also homogeneously distributed between industrialized and developing countries, or between people with and without physical disabilities. The digital era’s potential to improve the quality of work and life is clearly real. But it is not a given.

The values, agreements, and institutions of an earlier industrial era are often no longer suited to current trends in working conditions. Gaps in social protection are opening up. Some of the self-

employed, for example, are in disguised self-employment, dependent on an individual employer but without the benefits of an employment contract. Also, as stimulating as work can be in fast-paced, semi-autonomous work teams, not all workers are likely to appreciate the greater risks associated with greater responsibility. These risks extend from the need to keep oneself “employable” through continuous learning to the greater stress of having simultaneously to manage competing demands, cope with information “overload”, etc. An irony of the communications revolution, moreover, is that a sharply higher intensity of virtual communications can go hand in hand with increased isolation. That much work in the digital era can be done anywhere, anytime has meant for some that this is precisely what is occurring, with a consequent blurring of hours of work and hours of leisure. Far from adjusting working needs to the needs of family life, there can be rising pressure to work everywhere and all the time. Older workers could be excluded from the new careers and opportunities created by the technologies, and women, too, as they lag behind men in scientific and technical training. The report highlights many more risks, ranging from those of health and safety, to invasions of privacy, and skill polarization.

## **Social actors and social choices for addressing negative consequences**

Addressing the negative consequences of changes in the nature of work has been the key function of industrial relations. In creating a more diversified labour market, however, the diffusion of these technologies renders the effort of collective organization and representation far more difficult. The technologies are associated with smaller units of production and they accelerate both the trend toward outsourcing, as well as the frequent redefinition of who is a core employee and who is not. Fragmentation in the organization of production, and a continually changing organization of work, are additional challenges to organizing workers in the new economy.

The effects of ICT on the quality of life at work have strong potentials in both positive and negative directions. It is clear that the need for worker protection remains and is arguably greater in the context of the disruptive changes that are occurring. There is evidence of the need for changing attitudes and strategies within the trade union movement to address issues of organizing and the representation of new areas of worker protection. Some international trade secretariats, such as the Union Network International (UNI), have comprehensive strategies and programmes in place for the networking economy. For example, UNI’s “online rights for online workers” campaign emphasizes employee representatives’ right to corporate email and intranet communications, and the right for privacy and due process in the monitoring of employee communications.

Various of the risks to the quality of life at work are also being addressed by trade unions in their policies, bargaining agreements, or tripartite negotiations. Of these, the right to lifelong learning and access to such opportunities is perhaps the most fundamental, and one where substantial progress is being made. In recognition of the fact that teleworking creates welcome opportunities for some employees but also risks it, too, is an area in which collective bargaining is extensive. Common features in telework agreements include that it be undertaken voluntarily, that the worker’s decision is reversible, and that the pay and employment status of the teleworker are not downgraded.

The issue of stress at the workplace is also beginning to enter the bargaining agendas of trade unions. The digital reproduction of intellectual property is a concern of workers in the entertainment and media interests, and a focus of bargaining for journalists. Trade unions are also addressing the digital divide through expanding access to the new technologies. Both the

Swedish LO and the AFL-CIO in the United States, for example, assist in the effort to overcome the within-country digital divide through the provision of low-cost, Internet-connected PCs to members. International trade secretariats are also assisting their affiliates in developing countries to become digitally literate.

However much it may be the case that the present era of technological change presents certain risks to labour market institutions, the technologies can also be of benefit to trade unions and employer organizations. For example, some employer organizations, such as ALMEGA in Sweden, have created an online presence - a "virtual employers' organization" - allowing them to provide interactive services, individually tailored to members' interests. The Web allows them to reach out to non-members as well, particularly the new small firms in the new economy.

For trade unions, the fundamental aim remains that of organizing the new, more diverse ICT workforce. UNI has targeted the organizing of freelance workers as a priority area, for example. Some trade unions have established organizations especially for the self-employed. In the Netherlands, the Allied Union in the FNV federation created the FNV Zelfstandige Bondgenoten in 1999, the first Dutch trade union specifically for self-employed people. In the United States, a variant of the "guild model" of organization is being experimented with by a newly formed organization affiliated to the Communication Workers of America: the Washington Alliance of Technology Workers (WashTech) is a new Web-based service provider for agency and directly employed workers in the ICT sector, offering individual services, rather than collective bargaining.

Access to information and the collective strength of communication can assist trade unions in redressing imbalances of power in the workplace. The Internet was the vehicle through which the Seattle protests against the World Trade Organization meeting in 1999 were organized. There are also numerous examples of how the Internet has been used to increase the Asymmetry of information" at the bargaining table. Through the Internet, local disputes can go global". Many trade unions have engaged in "cyber-pickets" to shed light broadly on violations of worker rights and bad industrial relations practices. In a global organization of production that increasingly relies on information flows in real time, giving greater leverage to the voice of workers is a clear possibility.

## **Conclusion**

The report's final chapter raises the issue of policies needed to increase the potential gains of the emerging digital era and lessen the costs of adjustment. The positive potential of the technologies for employment growth, a better quality of life, and as a tool for reinforcing the development agenda is beyond doubt. Not beyond doubt is whether this potential can be translated into reality for the majority of the world's people anytime soon - or whether the risks of change can be avoided. A passive policy stance that leaves to markets alone the direction of change will reinforce divides. It is also the case that the quality of life and work for women and men will be exposed as much to the potential for negative outcomes as positive ones. For all these reasons, social choices and the social institutions through which such choices are moulded are essential to the digital era.