

A Growing Trend Towards Knowledge Work in Finland¹

All advanced economies are increasingly dependent on a highly educated and knowledgeable workforce. The consensus has it that the wealth of a nation depends neither on abundant natural resources nor capital, but rather on the intellectual capability of individual workers and the skills with which organizations harness and develop this asset. In keeping with this trend, the demand for knowledge workers who are capable of handling, synthesizing and creating new knowledge has grown, while space for traditional manual work, susceptible to be replaced by automation and mechanization, has been reduced. Especially managerial, professional and technical occupations have expanded. However, statistics also indicate that the most rapid growth of knowledge work is over. Although knowledge-driven industries will continue to generate a major proportion of export revenues, there are no new jobs in sight in this sector in Finland.

INTRODUCTION

When one flips through the pages of popular business magazines or mainstream management books, it is easy to get the impression that the notion of knowledge work is new. However, the economist Fritz Machlup, observing development in American society, established knowledge-based activities as a legitimate field of empirical research in economics as early as 1962. Peter Drucker (1969) and Daniel Bell (1973) then popularized the idea beyond academic circles. Simultaneously, yet independently of their American counterparts, Japanese researchers foresaw the coming of an information society (*johoka shakai*) and also developed a distinctive methodology for quantifying the consumption of information flows cascading across society's communication channels (Ito 1981).



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Although these early 'traditions' of information society studies represented completely different schools of thought, their conclusions were quite similar. On the one hand, if we look at the latter half of the twentieth century, we can see a significant increase in the production and consumption of information goods and services. Communication systems constitute one of the fastest growing and most important components in the economies of most nations. It is also said that the volume of information at our disposal is now doubling every couple of years. On the other hand, we can also witness the rise of knowledge work as a major trend in Western labour markets, a key factor that distinguishes globally competitive economies from their weaker rivals (Soete 2001). What is in demand now is a high level of education and skills that add value to the goods and services produced.

The growing importance of knowledge as an economic resource reflects the fact that, as economies and production technologies develop, they become ever more complex and

specialized, leading to increasing coordination costs. In the language of information economics, the organizational or informational task of coordinating the diverse steps in the productive chain grows, as the number of transactions within and among productive units increases (Joncher 1983, 15). Logically, the increasingly complex economy must also generate more information flows (Robinson 1986, 186). In other words, the more complex and specialized the production system becomes, the more communicative effort is required to manage organizational processes.

In keeping with this trend, the demand for knowledge workers or informational labour that is capable of handling, synthesizing and creating new knowledge has grown, while space for traditional manual work, susceptible to be replaced by automation and mechanization, has been reduced. As a consequence, especially managerial, professional and technical occupations have expanded.

THE RISE OF KNOWLEDGE WORK SPEARHEADED BY THE US

It is hardly coincidental that the first scholarly authors on knowledge work – including Machlup, Drucker and Bell – chose to concentrate on the United States, and the Japanese *johoka shakai* researchers also used the US as their benchmark case. According to Machlup and his successors, most notably Marc Porat (1977), the US has led the way towards the informationalization of social structures. Compared to other OECD countries just a few decades ago only Canada was on a par with the US in terms of the size of the information sector and its employment effects (see OECD 1981). By the beginning of the 1970s around 40 per cent of the working population in the US and Canada were classified to the information sector, whereas in most other OECD countries the figures were still considerably lower. In Finland, for example, just above one-fifth of the workforce was categorized as informational in 1970.

These early comparative statistics were premised on the well-attested observation that occupations in primary production and manufacturing were giving way to a growing percentage of service and white-collar work. Following the example set by American scholars, the OECD contended that conventional statistics actually hide from view a profound structural change which relates to the role of the activities of generating, processing and distributing information as well as the goods and services that these activities absorb. Based on a survey of nine OECD member states, it was projected that the occupations involved primarily in informational activities represent an important and rapidly growing segment of the labour force.

Today, we may conclude that this has indeed happened. Knowledge workers have risen to prominence both in numbers and especially in terms of their significance for all advanced economies. In this respect, Finland is a case in point. The ‘revolution’ in knowledge work occurred relatively late but, on the other hand, the process of change was very rapid, with far reaching consequences for working life and society at large.

The Proportion of Informational Labour in Nine OECD Countries in the 1970s

Country	Year	%
Austria	1971	28.0
Canada	1971	39.9
Finland	1970	22.1
France	1975	32.1
Germany	1978	32.2
Japan	1975	29.6
Sweden	1975	34.9
United Kingdom	1971	35.6
United States	1970	41.1

Source: OECD.

Figures for Finland are derived from sources that use a somewhat narrower definition of informational labour than other countries.

Although the figures are not fully comparable, the lead enjoyed by the US and Canada remains substantial and thus is of interest here.

KNOWLEDGE WORK IN THE CONTEXT OF FINLAND

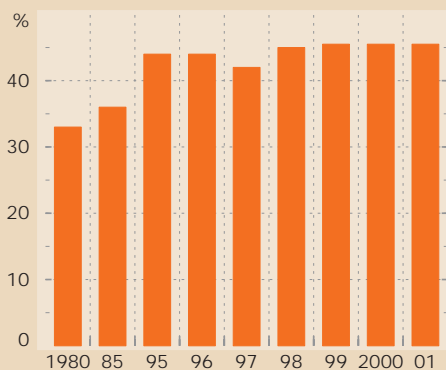
According to a comprehensive survey project by Raimo Blom *et al.* (2001; 2002) the proportion of knowledge workers in Finland more than tripled from 12 to 39 per cent between 1988 and 2000. In this study knowledge workers were defined as wage (and/or salary) earners whose jobs meet the following three criteria: (1) the use of information technology; (2) independent design of important aspects of the job; and (3) at least upper intermediate vocational training (a college degree). Above else, these figures reflect a clear shift in the division of labour towards jobs which require IT skills: by now well over two-thirds of all wage earners use a microcomputer, computer terminal or work station at work. However, as Blom *et al.* describe, other skill demands placed on individuals have been on the increase as well.

Figures released by Statistics Finland give a somewhat more detailed picture on recent

trends in development in Finnish society. According to Statistics Finland up to one third of wage earners were engaged in information occupations in 1980; by 1995 the share had increased to 44 per cent but then levelled off. Since the mid-1990s, growth in these occupations has been virtually non-existent. In 1999 the proportion of information occupations reached 45.5 per cent, and no change took place in the following two years. Unfortunately, due to revisions of statistical criteria in 1997, subsequent comparisons are not completely reliable. Nevertheless, we may conclude that the most rapid transitional period is over and the proportion of informational labour has become more or less stabilized.

Why this sudden slowdown in the growth of informational labour? The most probable explanation lies in the recession that swept across Finland in the first half of the 1990s, and particularly in the negative employment trends in the public sector, which are still reflected in the figures for the latter half of the decade. Due to the recession the expansion of the public sector not only ended abruptly, but many services had to be dramatically cut. Although the recession was followed by a period of strong growth, there was no turning back to the days of the expanding welfare state (Pyörä 2003). This is important because public administration, health care and education employ large numbers of knowledge workers. There is also the possibility that increased information handling productivity, for example via office automation, will have a stabilizing effect on the relative size of the information sector, contributing to the saturation of demand for knowledge workers. However, it is impossible to make any firm predictions as to what is going to happen in the long term.

The Proportion of Persons Employed in Information Occupations in Finland



Source: Statistics Finland.

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Following the OECD, Statistics Finland has adopted the term 'information occupation' instead of 'knowledge work'. The figures are derived from official labour force surveys and as such they are based almost directly on the ISCO-88 standard; i.e., the International Standard Classification of Occupations by the International Labour Organization (ILO). Although occupational classifications have their problems (e.g., comparisons over time can sometimes be unreliable), they nevertheless allow for cross-national comparisons as well as a detailed breakdown of the occupational structure.

For the reasons outlined above it is likely that the growth of knowledge work in Finland has approached its 'natural' point of saturation beyond which further growth slows down considerably. In the US this kind of turning point

was reached as early as the beginning of the 1980s, although for different reasons, of course. In 1980 already half of the American workforce was classified to the information sector (Schement & Curtis 1995, 85).

In addition to the overall growth pattern of informational labour, figures by Statistics Finland reveal some other interesting facts about the structure of labour demand. Following the OECD, Statistics Finland has divided informational labour into five main categories illustrated in table below (see also Paakkolanvaara 1988; Statistics Finland 1999). Perhaps the most important observation here is that both the relative share and especially the absolute number of workers classified as information producers have shown the sharpest growth. In general terms, information producers create new information or rearrange existing information into novel configurations. In both instances the output of work is highly context-sensitive and sometimes even unpredictable. This group of workers includes all scientists as well as the producers of consultative services and market information (e.g., health care specialists, legal and financial advisers and technical experts). According to some recent estimates, for example, different R&D jobs employ around 70,000 people in Finland today. This puts Finland in the top league among OECD countries.

Another important observation represented in table below is that the share of information distributors and users has also increased. As distinct from information producers, these two groups of workers are primarily concerned with communicating existing information, although their work may include some elements of information production. The category of information distributors comprises teachers and communication and cultural workers (e.g., journalists), whereas the category of information users is confined to administrative and supervisory workers (e.g., line managers).

On the other hand, occupations related to information processing (e.g., office clerks) have remained at quite a stable level while the use and maintenance of IT equipment has somewhat surprisingly declined. There are two primary reasons for these developments. First, office automation has made certain occupations such as simple word processing jobs redundant. To take a concrete example, in the age of portable PCs, palm computers and communicators there is no need for most knowledge workers to delegate simple word processing tasks to subordinates. Instead, it makes sense to send drafts via e-mail directly to the right colleagues, secretary or professional editor. Second, modern computer hardware requires relatively little maintenance compared

Trends in the Proportions of Persons Employed in Information Occupations in 1980-1998

1000's	1980	1985	1995	1996	1997	1998
I Information producers	224	282	334	348	345	373
II Information distributors	100	117	137	137	142	153
III Information users	109	132	151	156	160	182
IV Information processors	215	229	213	208	209	219
V Use and maintenance of IT equipment	109	108	75	71	64	67
Total	757	868	910	919	920	993
All employed persons	2328	2437	2068	2096	2170	2222
Information occupations (% of all employed persons)	33	36	44	44	42	45

Source: Statistics Finland. Figures for 1997 and 1998 are not fully comparable with those for earlier years.

to increasingly complex software. Computer support personnel have consequently come to resemble information distributors who consult and mentor end users rather than merely install or repair machines.

Similar trends indicating the growing importance of professional and technical occupations have also been reported elsewhere, in accordance with the general theory of post-industrialization, exemplified by Bell's (1973) work. To name a few examples, in such countries as New Zealand (Engelbrecht 2000), Singapore (Kuo & Low 2001) and the US (Martin 1998) and Canada (Lavoie *et al.* 2002) the growing proportion of informational labour has mostly been due to an increase in the number of information producers, scientists and engineers in particular. Conversely, the occupations related to routine information handling have declined fastest. Since the production of information is fundamental to the growth and strength of an information society, this development can be interpreted as a healthy sign (Kuo & Low 2001, 286).

However, it has to be pointed out that the informationalization of work also means that the labour market has become more selective than before. The tendency for the workforce to be divided into a stable core and a disposable periphery is a common feature of advanced economies (Castells 1996; Frenkel *et al.* 1999). In Finland, this is clearly seen in high unemployment levels being constantly coupled with a shortage of competent labour in certain industries. In the current situation the people who are out of work simply do not have the competencies required by potential employers.

THE FUTURE OF EMPLOYMENT IN FINLAND

During the social and economic upheavals of the 1990s Finland became more dependent than ever on its highly knowledgeable workforce. Today, with a view to nurturing its ability to update and renew itself, Finland continues to invest heavily in education and R&D while

emphasizing extensive and systematic cooperation between publicly funded research institutions and private enterprises. So far the results of this policy have been good. According to Swedish sociologist Mats Benner (2003), the Scandinavian countries have managed the transition to the 'new economy' well, but Finland clearly stands out in comparison to its neighbours, 'with its concerted effort to move from a raw materials-based growth pattern into knowledge-intensive production, while not deviating from the established welfare and employment policies' (p. 147).

In my view, however, a social structural change lies ahead for Finland: the same welfare mechanisms that have helped Finland to produce highly educated and adaptive citizens are now in need of reorganization. In the face of increasingly global competition for informational labour and high-performing enterprises, pressures to cut back taxation and thus public spending are building up, perhaps even marking the end of the welfare state as we know it. The paradox here is that to a large extent the success of the Finnish economy can be attributed to strong and universal welfare mechanisms. In the future, however, Finland needs to learn how to do more with less. This is probably the most decisive challenge that the Finnish information society must overcome in order to prosper (see also Pyörä 2003).

These problems reflect structural rigidities in Finnish society. Although conducive to social equality, a centrally set wage bargaining system coupled with high taxation and employer contribution rates are among the most often criticized factors hindering an increase in labour market participation and entrepreneurship (it remains to be seen whether or not the government's recent tax reform implemented in November 2003 proves sufficient). Yet, in order to balance the rapid ageing of the population and sustain the welfare state, Finland should boost its employment rate. The two horns of the dilemma can be described in this way:

while the availability of expert labour for international high-tech firms needs to be secured, for example by making immigration a more attractive option, it is of equal importance to retain traditional manufacturing jobs in the country as well as to create new employment opportunities for the less skilled.

In the foreseeable future knowledge-driven enterprise such as Nokia will continue to generate a major proportion of export revenues, but due to ever more efficient production methods and global outsourcing of labour, there are no new jobs in sight in this sector in Finland. Instead, the real demand for labour is on the increase in various in-person services, which must be produced on a local basis (e.g., health care services for the elderly). Continuous investment in higher education and R&D is certainly necessary in order to sustain Finland's competitiveness but, unfortunately, this policy is largely powerless in the face of the high level of structural unemployment.

FOOTNOTE

¹ This article is based on a forthcoming book *Knowledge Workers in the Information Society: Evidence from Finland* by Pasi Pyöriä, Harri Melin and Raimo Blom.

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