

# ICT Sector Characteristics in Finland

**Iiris Aaltio**

*Lappeenranta University of Technology, Finland*

**Pia Heilmann**

*Lappeenranta University of Technology, Finland*

## INTRODUCTION

The ICT sector is a newcomer in the Finnish economy. The pace of growth in the Finnish electronics industry was extraordinary over the 1990s. It led to an industrial restructuring in which knowledge replaced capital, raw materials, and energy as the dominant factor in production (Ali-Yrkkö, 2001). The Finnish ICT company Nokia is a world leader in mobile communications. Nokia connects people to each other and the information that matters to them with easy-to-use and innovative products like mobile phones, devices, and solutions for imaging, games, media, and business. The net sales of Nokia totaled •29.3 billion in 2004. Nokia provides equipment, solutions, and services for network operators and corporations. The company has 15 manufacturing facilities in nine countries, and research and development in 12 countries. At the end of 2004, Nokia employed approximately 55,500 people. Nokia is a broadly held company with listings on four major exchanges (<http://www.nokia.com>). While Nokia's role in the Finnish economy is considerable, there is a large number of other actors in the ICT sector: hundreds of small and medium-sized, fast-growing companies networking and cooperating with Nokia. The strong ICT sector is largely the outcome of mutually enforcing, dynamic cluster relations, which were intensified during the 1990s. ICT managers are mainly engaged in developing software. The work is largely connected to projects in which suitable applications are developed for customers' needs. Applications are usually designed through interaction with customer representatives and software developers (Heilmann, 2004). The customers and the users of ICT in Finland are both women and men, but the majority of the workforce consists of men.

*At the customer's side, there are many female ICT professionals. We can have a meeting where there are more women than men, and these women are really capable.*

This article considers, first, background information about the ICT sector. Then information-technology companies are analyzed as sites for women's work. Future trends and needs of research are examined next, and finally the conclusion is presented.

## BACKGROUND

While Finland is highly dependent on its two main business sectors, forestry and ICT, the attractiveness of the sectors, career development in the businesses, and their future developments are interesting fields of study. The second sector (ICT) is a newcomer, and the first one (forestry) has a long history. ICT has meant for many small economies like that of Finland a possibility for growth and development. The infrastructure in Finland is also recognized to be highly supportive for sector development because of good expertise backgrounds, schooling, adult learning, and state support. Does it attract women and men equally, and what will be its attractiveness in the future? Do women and men advance in the field in similar ways?

This study is comprised of two primary forms of research: literature on the ICT sector's development and empirical interview data gathered in 2002. The interviews were held with 15 ICT managers in Finland, including 2 females and 13 males. The average age of the ICT managers was 34.13 years. The managers were highly educated; 73.3% of all

the managers had an academic degree, mainly that of a master of science in technology. Twenty percent of ICT managers were undergraduates in a technical university (Heilmann, 2004).

When compared with the paper business sector (producing pulp, paper, and paperboard), an older Finnish business sector with a long tradition, typical of the ICT sector seems to be the importance of networks, team working, and togetherness between workmates, even during leisure time (Heilmann, 2004). These characteristics also guide work advancement and have an impact on career development.

## **MAIN THRUST OF THE ARTICLE**

The ICT sector can be characterized as a cluster. Clusters are used to describe networks of organizations in which competitive advantage grows from the dynamic interaction between the actors. Cluster relations cross the boundaries of sectors and spur innovation and upgrading through spillovers and knowledge transfer. A cluster can also be defined as a “network of networks,” which has economic importance at the macro level (Ali-Yrkkö, Paija, Reilly, & Ylä-Anttila, 2000). The network dynamics cause positive effects on companies’ competitiveness. The information and communication cluster, based on competence and technical development, has been able to offer new job opportunities, even if the time for the most rapid growth seems to be over.

In Finland, the main areas of the ICT cluster are the manufacturing of communications equipment and service provision. These areas have increased their share in the information and communication cluster (Hernesniemi, Kylmäläinen, Mäkelä, Rantala, Rautkylä-Willey, & Valtakari, 2001). Around the key industries there are industries that are considered to harbour special potential in enhancing the competitive advantage of the system through innovative applications on ICT, or through the improvement of its functional preconditions (Paija, 2001). The growth of the ICT cluster is not only connected to the growth of the markets in question, however. It is also connected to the general rise of the technical level in production and society (see Koski, Rouvinen, & Ylä-Anttila, 2001).

## **Careers in the Finnish ICT Sector**

Because the ICT industry went through a very dynamic expansion during the 1990s, there was an especially big demand for young ICT professionals who had not only the necessary technical skills, but who could also understand the needs of customers within the new economic environment (Ruohonen, Kultanen, Lahtonen, Liikanen, Rytönen, & Kasvio, 2002). Universities and research institutes have been successful in producing competent human resources and world-class research and development to support the development of the cluster. The supplier industries, particularly the electronics industry, in turn, have become highly specialized over the last decade to meet the needs of the key activities of the sector. The venture-capital market, as an example of associated services, has emerged as a new and important source of funding that has greatly enhanced preconditions for growth in the cluster (Paija, 2001).

The concept of career has been changing. Career progression has typically meant vertical advancement within one or more organizations, but nowadays it often describes lateral movements within an organization or from one company to another (Stroh & Reilly, 1999). Women should cope with the changing career environment, and within ICT, this means an increasing importance of the role of professional networks in career advancement.

In the future, the software sector will grow from a “nerdy” business into a professional business. Diverse skills relating to internationalization, especially experience in business management associated with international trade; language skills; negotiation skills; and knowledge of different cultures and administrative bureaucracy will be in great demand. In terms of personal skills, visionary capabilities, the ability to perceive matters in their entirety and to concentrate on essentials, communication skills, project and teamwork skills, adaptability, the ability to manage change, creativity, and courage will be emphasized. Strategic expertise will focus especially on network-related capabilities and on understanding the changes brought by the new economy and value chains within the digital economy. Eclectic scientific knowledge, the ability to integrate

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