

The employability of ICT professionals. A study of European SMEs

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Abstract: The present paper examines the management of employability of ICT professionals by small- and medium-sized enterprises (SMEs) in Europe. Employability can be defined as the extent to which employees have skills which the market and employers regard as attractive and is of increasing importance for the ICT sector, especially SMEs. The paper uses secondary data to characterise the ICT sectors in seven countries representing a range of markets, from highly developed to small and emerging, and presents a qualitative study of managers' in ICT SMEs attitudes towards employability and its management. The findings suggest an ad hoc and informal approach across countries towards assessing and developing existing employees' competencies, despite acknowledging skills gaps and the criticality of certain technical and non-technical qualities for meeting market demands.

1. Introduction

The paper describes a study conducted as part of the Indic@tor project funded by the European Commission (IST-2000-31070). The study examined the employability of ICT professionals and its management by small- and medium-sized enterprises (SMEs) in Europe and was conducted against the backdrop of a turbulent ICT sector, in particular at a time where there was a significant downturn in the market (2002-2003). Employability can be defined as the extent to which employees have skills which the market and employers regard as attractive. The development of technical and professional workers is an area of high priority for governments concerned with creating an adequate supply of skilled labour and fuelling economic growth, while for SMEs, there is general concern about the supply and utilisation of ICT skills, high turnover of experienced staff, and the under supply of qualified new entrants into the profession [1] [2] [3]. It is argued here that, despite the considerable retraction in the labour market evidenced at the time of the present research, the notion of employability enhancement remains a significant concern for both employers and policy makers in this dynamic sector.

Employability has gained in importance as the nature of employment and work patterns, particularly in knowledge-intensive industries, has changed. Discontinuous forms of employment, such as temporary contracts and increasing subcontracting, mean that employers are viewed increasingly as providers of the necessary knowledge and skills which enhance employability rather than secure employment [4] [5]. This highlights a tension between the role that should be played by organizations and individual employees in continuously updating knowledge and skills to enhance professional development. Employers generally do not take full responsibility for eliminating perceived skill gaps in their companies either through strategies for retaining highly qualified staff or through the provision of expensive training, mentoring or other development strategies. They may be reluctant to invest in the development of skills which make their employees more

marketable while employees themselves may develop expertise which is too narrow to stay employable in the long run and keep up with technological and scientific developments. In difficult business conditions, training is unlikely to be of high priority for employers, although it may increase in importance for employees faced with a more competitive labour market.

Highly qualified employees may also face declining re-employability when entering later stages of their career. The consideration of age-related issues in career development is relatively recent but there is growing concern about guiding individuals' professional development throughout their working life facilitating life-long learning approaches [6]. Given the ageing and dejuvenisation of the working population (i.e., the increasing proportion of older people coupled with decreasing proportions of young people in the labour force) and the tendency for older employees, working in middle and higher-level functions, to become immobile and overspecialised in narrow occupational domains, the need to ensure employability throughout the working career is apparent. Yet, the extent to which either management or employees themselves are actively engaged in furtherance of the professional career noticeably declines as employees age. For individuals, there may be serious consequences for older employees whose function becomes obsolete and who are unable to adapt to changing requirements.

2. Objectives

Despite the increasing importance of employability for governments, employers and employees, there has been little scientific study of how employability is acquired by individuals and how it can be developed and sustained over the life cycle of a career, especially in the relatively new ICT sector and for smaller employers with limited resources. The present study attempts to address this gap by examining employability of ICT professionals in different European countries and the management of employability by ICT SMEs. The paper has three objectives:

1. To examine the nature of employment in the ICT sector in seven European countries (Germany, Greece, Italy, the Netherlands, Norway, Poland, and the UK), each of which is expected to represent different employment conditions for ICT professionals.
2. To explore the perceptions of ICT SME employers in these countries with regard to the importance of employability for their organizations and their concerns in attempting to manage this quality of employees.
3. To consider the implications of the study findings for sustaining employability across Europe, particularly in terms of the expected role of employers and the development of professional expertise through all career stages. Issues impacting SMEs in the ICT sector during the economic downturn of 2003, in particular, will be highlighted.

3. Methodology

The empirical focus of the paper involves two analyses, one using secondary data sources and the other based on qualitative interviews of ICT SME managers. First, an analysis of the ICT sector in the seven countries based on cross-national and national data sources provides a summary of the key features of the ICT sector, including its contribution to economic growth, and a description of the high-skilled ICT workforce (e.g., demographic characteristics, labour market supply and demand for ICT professionals, and the nature of companies employing ICT professionals).

The second approach was to conduct in-depth interviews with a selected group of managing directors, CEOs or managers in ICT SMEs who were representative of the population of ICT companies identified in the sector analysis. This was intended to explore employers' understanding of occupational expertise of ICT professionals, and the extent of

practice addressing employability issues (e.g. dealing with skills gaps, performance assessment, or career planning). Interviews were conducted in all seven countries from April 2002 to February 2003 and aimed for five companies in each of three SME sizebands: 10-49 employees, 50-149 employees, and 150-249 employees. A common semi-structured interview protocol was used covering three themes: employability (13 items), ageing (8 items), and future developments and requirements (13 items). The final number of interviews conducted was 107; numbers by company size in each country are shown in Table 1.

All final interview transcriptions were analysed at a national level by researchers in each country according to a common coding scheme. This was constructed on the basis of three Dutch interviews by subdividing the data into core labels (variable categories), dimensions of core labels, and loadings [7]. There were three core labels: employability, ageing, and future developments and requirements, each of which was assigned several dimensions. For example, the core label employability included the dimension ‘employability management’. A loading represents a group of similar statements given by respondents which are indicative of a certain dimension. Researchers at the national level were able to add additional categories to this general framework for each item. Comparable answering patterns were aggregated in the cross-cultural analysis to produce an overall frequency table of responses.

Table 1: Number of interviews conducted by SME size

<i>Country</i>	<i>No. of employees</i>			<i>Total</i>
	<i>10 – 49</i>	<i>50 – 149</i>	<i>150 – 249</i>	
Germany	3	7	5	15
Greece	13	2		15
The Netherlands	10	2	3	15
Norway	5	5	5	15
Italy	10	3	2	15
Poland	6	6	6	18
United Kingdom	8	5	1	14
Total	55	30	22	107

4. Results

4.1 The ICT market in the seven countries

The European Information Technology Observatory’s (EITO) 2003 overview of the ICT sector across Europe shows a picture of rapid growth during the 1990s and decline since 2000. Market evaluations for 2002-2003 indicated zero growth in Europe in 2002 and the prospect of limited development in 2003 (growth of 2.5%)[8]. However, there is expected to be strong growth in internet penetration and broadband connections (DSL and cable). This has lead the EITO to forecast 3.1% growth in the total ICT market for western Europe in 2004 with some segments of the market, particularly software products and carrier services, showing stronger performance [9].

Comparisons across the seven countries showed key differences in the development and distribution of ICT activity. At the high end of development, the UK and Germany represent the largest IT software and services markets in Europe. In 2000, the UK contributed 9% and Germany 6% of the overall OECD ICT sector employment (by comparison, amongst OECD countries, only the US and Japan have higher country shares on both measures) [10]. They also represent a sizable proportion of Europe’s overall employment in high technology [11]. Growth in the ICT sector for both countries is currently around 10% per annum and they each employ close to 1 million people.

Italy is the fourth largest ICT market in Europe (after Germany, UK and France) with a growth rate of 12% per annum. It is ranked sixth in terms of OECD share of ICT employment (after the US, Japan, the UK, Germany and France) and fifth in terms of country share to the total OECD value added of the ICT sector (after the US, Japan, Germany and the UK). It employed over 700,000 people in around 108,000 companies.

The ICT sector in the Netherlands, although representing only 1.2% of the OECD's total ICT sector value added and 1.6% of total OECD ICT employment, has seen rapid growth in terms of its contribution to the national economy, with contribution to GDP growing from 9% to 13% between 1996 and 1998. In 2000, the sector employed almost 270,000 people in around 27,000 companies.

Norway is a relatively small ICT market relative to other countries in the project, employing around 84,000 people in 10,000 enterprises, but in 2001, the ICT sector grew 7.7% from 2000. This represented 4% of total employment and 6% of the economy. Norwegian ICT employment and value added are dominated by consultancy services which accounted for 45% of all employment in the ICT sector in 2001 and unlike the other industries within the ICT sector showed significant growth between 1995 and 2001.

Poland saw rapid growth, exceeding 22%, in its ICT sector through the 1990s which began to retrench in 2000 falling to 8%. The value of the Polish computer market was estimated at \$2,500,000 in 2000 rising by around 10% from 1999. This largely reflects the deteriorating economic situation and slower rate of development of the Polish economy in general.

Finally, although Greece has the smallest market in our sample of countries (the ICT sector accounts for over 4% of Greece's GDP and experienced a 9.4% growth rate in 2002) there is a faster rate of growth in telecommunications. The Greek telecommunications market (which includes telecom services, equipment, and systems) is driven by the recent expansion in mobile telephony and deregulation of the industry. The ICT industry in Greece is expected to grow about 5.6% in 2004.

4.2 The ICT professional workforce

In all countries, ICT professionals, defined here as IT practitioners whose job involves "designing, developing, producing, installing, managing, maintaining or supporting systems for other people to use" [12], are employed by both ICT-suppliers (i.e., organizations whose primary purpose is IT supply) and ICT-users (i.e., organizations whose primary business is in another sector of the economy, such as telecommunications or manufacturing). There is a strong emphasis on ICT services in all countries, with the majority of enterprises classified in 'Computer and Related Activities' and 'Other ICT services' according to Revision 3 of the International Standard Industrial Classification (ISIC)). The subsector 'Software consultancy and supply' accounts for approximately 40% of all ICT employment in Italy, the Netherlands, Norway and the UK. Combined with other ICT services, over half of employment is in ICT services. Only in Germany does ICT manufacturing comprise a relatively larger share of total ICT employment.

With respect to ICT professionals themselves, common job titles are application developers, technical developers, software engineers or computer analyst/programmer. The rate of growth in high-skilled ICT-related workers has been greater in Germany, the Netherlands and the UK. The EU average of high-skilled ICT workers as a proportion of total employment was 1.7%. This compares to the highest share of high-skilled ICT workers which was in the Netherlands (3.2%) and the lowest which was in Greece (0.6%). The demographic profile of ICT professionals suggests a common pattern across all countries; this group is more likely to be male (approximately 70% across the seven countries); aged between 25 and 40 (again over 70%, although software engineers tend to

be even younger); and better qualified than the workforce as a whole (i.e., more likely to be university graduates, particularly in computer science).

4.3 Labour market demand and supply

The increased activity in the ICT sector during the 1990s, partly due to liberalization of the telecommunications sector, the authorization of new mobile telephone providers, and the level of internet and new media diffusion, has resulted in an increased demand for labour with ICT skills in both ICT supplier sectors and end-user sectors [13]. Since 2000, however, there has been considerable retraction, as is evident in the analysis for all countries. There is also a gap between the skills of current and future workers and the needs of firms. Studies carried out by International Data Corporation estimated skill demand and shortages in the EU-15 countries, Norway and Switzerland. ICT skill shortages in particular areas (internet-related activities, IT-supported business activities and host-based, distributed and applications environments) were expected to reach 13% of total demand in 2003 [14]. The demand for these ICT specialists was found to vary across countries, being particularly high in the Netherlands, where ICT has one of the highest weights in total employment, and low in Greece, where supply and demand are more balanced. The skill shortage in the UK was just above the Western European average, while the level of skill shortage for Norway, Germany and Italy was below the average.

Policy responses to shortfalls in supply of ICT specialists do vary between countries, particularly in the role played by higher education, and the impact on ICT recruitment and training policies. While employers may look towards government to respond, for example, by expanding the supply of labour from higher education, as is the case in the UK [15], one implication of the present study is to consider the role of employers in generating a larger pool of highly skilled ICT employees (e.g., through work-based training and development). This issue is addressed further in the qualitative study and final discussion with respect to employability.

4.4 Analysis of ICT SME needs

Our interviews show that most ICT managers have an interest in employability matters concerning the whole organization. However, attention is often ad hoc due to the influence of the market in the ICT sector which tends to dictate the required competences for ICT professionals. Flexibility is needed in order to maintain adequate accreditation for new software and as a result strategies tend to be ad hoc to fit with current demands. Employability management, where it is present, tends to be directed towards assessment and development plans, mainly in order to keep ICT professionals up-to-date. Management also tries to enhance employees' commitment towards the organization and to a lesser degree to optimize the full utilization and development of competences. Responsibility for employability matters tended to rest with the director/management team, the human resource manager, or the manager of the department concerned.

Ageing and dejuvenization of the population did not cause any problem for the SMEs in this sample. Confirming the relatively young profile identified in the industry analysis, ICT professionals were found to function at senior levels, for example, as managers or directors of SMEs at around 35 years of age. Seniority was related more to competences which match the requirements of the market than age borders. However, some ICT managers thought young ICT professionals were more ambitious, mobile, and eager to learn than older professionals (over 40).

The present and future effects of the economic depression were mentioned by most ICT managers, and survival, especially for SMEs, was a major issue. Some companies where interviews were conducted have already gone bankrupt. Technological developments

have meant that updating of technical knowledge and expertise, as well as communication and consultancy competences has become more significant; yet, this is unaffordable in times of crisis. Nevertheless, ICT professionals have to be flexible generalists often without the help of real organizational structures to stimulate and maintain learning. For the majority, these issues, as well as the problems of combating and/or preventing skill ‘obsolescence’ or of increased demand for ICT professionals, were not priorities.

In short, the analysis found that, although there is an interest in employability matters among SME ICT managers, actual policy and action lag behind. In this respect the current economic depression and the developmental stage of the ICT sector in each participating country have a strong impact. The development of ICT professionals’ employability is not a top priority, but a luxury item on which little time and effort can be spent.

4.5 Implications for the management of employability of ICT professionals

Despite management interest in their workforces’ employability, there was little evidence of action to stimulate employees’ further growth and development, flexibility or versatility in any of the participating countries. Our analysis of the state of the ICT sector provides a strong indication of why this may be the case; the economic slowdown affecting the ICT sector since 2001 has meant a considerably less dynamic labour market for ICT professionals compared to the 1990s, implying less competition for skilled professionals and simultaneously fewer resources for companies to invest in developing their own employees.

Despite the difficult economic conditions, our sector analysis also showed that there are continuing skills shortages in some areas (primarily internet-related activities, IT-supported business activities and host-based, distributed and applications environments). The demand for such ICT specialists is especially acute in the Netherlands, and less of a problem in Germany, Greece, Italy and Norway. Nevertheless, this shows that technological developments are still likely to dictate the required competences of ICT suppliers and hence require continuous updating of technical knowledge in key areas of the market. Moreover, amongst the small ICT suppliers who make up the majority of the sector in all countries, we found that managers consistently identified ‘soft’ skills, such as communication, flexibility, teamworking and consultancy competencies, as important for dealing with client service interactions in addition to technical software or systems development skills.

The interviews suggest that SME managers and employers in all countries, while acknowledging the importance of this range of competencies for the survival of their companies, consider it unaffordable to invest in developing their employees in this way in times of crisis. They seemed unconcerned with formally gathering data on existing levels of competence or with taking strategic action to prevent ‘obsolescence’ and meet expected future needs.

Such a short-termist, instrumental approach to managing employees characterises well the increasingly temporary nature of employment relationships which, as we have seen, has been intensely felt in the volatile ICT sector. The need for rapid reaction times may also preclude managers from more strategic planning. They also may be unwilling to enhance the employability of their employees if they are likely to take these new skills elsewhere. Yet, a sizable proportion of managers across our seven countries also mentioned the importance of employee commitment to the organization, especially in a depressed market when an SME’s survival may depend on specific expertise possessed by one or two individuals. Some writers have argued that employees, in fact, are more likely to commit themselves to an organization which invests in broader competence development and enables career development and professional growth e.g., [16].

The existence of a human resource specialist may increase the chances of companies developing career programmes for their employees or of being aware of development issues, but for SMEs, a separate HR function is rare. The present results showed that it is more often the managing director or line managers who take responsibility for performance assessment and development. This is consistent with literature which describes smaller firms' competence development and acquisition as improvised and informal, e.g., [17].

On the basis of the present findings, ageing and dejuvenization of the population is not expected to cause any problem for SMEs, most likely because of the already young age profile of the sector at all career stages. There was some suggestion that younger workers display greater adaptability to changing market demands, for example in accreditation for new software, but the majority of managers interviewed claimed that promotions were based on possession of competence in areas driven by market-need and this was not age related. It may be that the more direct communication and flatter hierarchy possible in SMEs means that managers are less likely to be led by age stereotypes than in larger organisation with more formal hierarchies.

5. Business Benefits

The study has shown that managers in ICT SMEs take an informal and ad hoc approach to the employability of their employees, despite the pressures imposed simply to survive in a highly competitive and, at present, depressed market. By investing in the employability of their present personnel, however, many authors have argued that companies can facilitate the flexible deployment of staff and provide a binding force for IT practitioners who may be more likely to remain in organizations where they can keep learning and where their market value is sustained. Investing in existing staff also improves the recruiting power of the organization, making it more attractive for potential employees. This is a critical feature in tightening labour markets.

Ageing as a problem for employability was not yet recognised in the majority of our interviews. In the relatively young ICT sector, however, it is possible that ageing of the workforce will present a challenge in the future for ensuring and promoting the employment of people over forty years of age, as this group was acknowledged by some to be less likely to possess the required adaptability in technical competence required in the ICT sector.

In short, changing career direction or acquiring new competencies is to be expected in the dynamic ICT sector, where reorganisations or market changes are frequent. Employees whose acquired expertise is focused in a single area will be left aside in such shifts. Individuals may have to increasingly accept responsibility for their skills development and marketability; however, management also would benefit from ensuring that highly qualified employees remain committed to their companies.

6. Conclusions

Despite the diverse ICT sectors represented by the seven countries in the present study, interviews with managers of SME ICT companies revealed remarkable similarity in the concerns expressed with respect to issues of employability. SMEs in all countries, from the well-developed markets in the UK and Germany to the emerging Polish ICT sector and tiny Greek market, expressed concern with their own survival in the current economic conditions. There also was a general interest in attracting and keeping ICT professionals with key technical and general consultancy skills, but a relative absence of formal management systems for optimizing the competencies of their existing employees in the form of enhanced employability. Employee development practice and strategy in these ICT SMEs tended to be ad hoc, informal and short-termist.

The study fills a gap in HRM research generally with respect to SMEs as most HRM recommendations are based on studies conducted in large firms. Moreover, there has been little research on expertise and employability in the ICT industry, especially with respect to the role of management rather than other stakeholders, such as government and higher education, in expanding the supply of skilled workers. In addition to identifying the general lack of SME management of employability enhancement, the study addresses debates that individuals are increasingly expected to take responsibility for their skills development and marketability. While the paper confirms the relatively hands-off approach of management, the identification of continuing skills gaps and the potential resurgence of the ICT sector from 2004 each suggests that ICT SMEs also would benefit from ensuring that highly qualified employees remain both employable and committed to their companies. It can also be argued that the same applies under more buoyant market conditions than those encountered within the ICT sector at the time of the study. Ensuring the employability of workers enables organisations to meet fluctuating demands more effectively, particularly if attitudinal factors, such as adaptability and self-management, which are key dimensions of employability, are nurtured in addition to valued technical skills.

Although the ICT sector is of strategic importance for Europe, it continues to suffer from structural deficiencies, including insufficient supply of qualified human capital at both basic and higher skill levels. The present study supports proactive employer strategies in dealing with skill development, training and retention, even in economic downturn; it suggests further direction for policy-making for educational and training opportunities to enhance ICT careers in particular areas of skilled labour shortage and enhance entry into high skill occupations; and, finally, it shows that issues of ageing – and hence diminishing employability - during the life-cycle of an ICT career may become more of an issue in subsequent years for employers as well as individuals themselves.

References

- [1] P Cappelli, Why is it so hard to find information technology workers?, *Organizational Dynamics*, 2001, 30(2), pp.87-99.
- [2] R Hill and J Stewart, Human Resource Development in small firms. *Human Resource Development International. Enhancing performance, learning and integrity*, 1999, 2(2), pp.103-123.
- [3] ITNTO/AISS Skills 99 – IT skills summary. IT National Training Organisation and the Alliance for Information Systems Skills (AISS), Report to DTI and DfEE, 1999.
- [4] M B Arthur, K Inkson, and J K Pringle, *The New Careers: Individual Action and Economic Change*, Sage, London, 1999.
- [5] P Capelli, *The New Deal at Work*, Boston: Mass., Harvard Business School Press, 1999.
- [6] K Kwakman, B I J M Van der Heijden, J Streumer, A Wognum and S Van Zolingen, Current HRD trends in the Netherlands: conceptualisation and practices. *International Journal of Human Resource Development and Management*, 2002, 2(3/4), pp.358-378.
- [7] D B Baarda., M P M De Goede and J Teunissen, *Kwalitatief onderzoek [Qualitative research]*, Houten: Stenfert Kroese, 1995.
- [8] European Information Technology Observatory (EITO) 2003
- [9] European Information Technology Observatory (EITO) Update 2003. Available at <http://www.eito.com>
- [10] OECD, *Measuring the Information Economy 2002*, Paris, 2003.
- [11] I Laafia, *Regional employment in high technology*, Statistics in Focus, Theme 9, Eurostat, 1999.
- [12] CEPIS, *Information Technology Practitioner Skills in Europe*, 2002.
- [13] *European Competitiveness Report*, Annex. III.1 European skill shortages in ICT and policy responses, European Union, 2001.
- [14] IDC, *Europe's growing IT skills crisis*, London, 2000.
- [15] H Steedman, K Wagner and J Foreman, *The impact on firms of ICT skill-supply strategies: An Anglo-German comparison*, Centre for Economic Performance, London School of Economics, 2003.
- [16] J Gaspersz and M Ott, *Management van employability. Nieuwe kansen in arbeidsrelaties [Management of employability. New opportunities in labour relations]*. Assen: Van Gorcum/Stichting Management Studies, 1996.
- [17] C Hendry, M B Arthur and A M Jones, *Strategy through People – Adaptation and Learning in the Small-medium Enterprise*, London, Routledge, 1995.
