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Working Party on the Information Economy

ICT DIFFUSION TO BUSINESS: Peer Review

Country report: Finland

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FOREWORD

In December 2003, this report was presented to the Working Party on the Information Economy (IE). It was recommended to be made public by the Committee for Information, Computer and Communications Policy in April 2004.

The report was prepared by Tuomas Aho (consultant), Anders Hoffmann (OECD Secretariat), Pekka Lindroos (OECD Secretariat) and Graham Vickery (OECD Secretariat). The series of peer reviews of ICT diffusion to business is coordinated by Graham Vickery. It is published under the responsibility of the Secretary-General of the OECD.

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BACKGROUND

The OECD Growth Study concluded that information and communications technology (ICT) is a key input to productivity and growth performance (OECD, 2001*a*; 2001*b*; 2003*a*). In 2001 the OECD Council Ministerial urged the OECD to strengthen its peer review of structural reforms. The 2002 Council Ministerial requested “the OECD to increase its monitoring of member countries' implementation of the recommendations of the OECD Growth Study” (OECD, 2002).

This report is part of the peer review process of policies promoting ICT diffusion to business, which has been designed to respond to the two Ministerial requests as part of the Growth Follow-up; Micro-policies for Growth project. OECD peer reviews are used as a method to bring together peers from member countries to discuss the policy experience and its main challenges in one country at a time. Once a critical mass of countries has been reviewed, a cross-country comparative synthesis paper will be prepared with a view to identifying policy benchmarks. The review has been conducted in the Working Party on the Information Economy (WPIE) on 4 December 2003. The discussion and comments made at the meeting are reflected in this document.

This report reviews the status of *diffusion of ICT to business* in Finland by examining the available indicators and describes the current and previous policies aimed at ICT uptake in firms. That area was designated as the focus policy domain for the peer reviews. It is one of the five pillars of the ICT policy framework that is used in the IT Outlook Policy Questionnaire, as reproduced in Table 1. Given the complexity of the ICT diffusion process and the central role of a number of the other factors attention is also given to the other parts of the framework, but they are not the primary focus of this review.

Table 1. ICT Policy Framework

ICT Policies				
Fostering ICT Innovation	Increasing Diffusion / Use	Maintaining a Healthy ICT Business Environment	Enhancing the Infrastructure	Promoting Trust Online
R&D programmes	<i>Diffusion to households and individuals</i>	<i>Competition in ICT markets</i>	Electronic payment / settlement	<i>Security of information systems and networks</i>
Government development	<i>Diffusion to businesses</i>	<i>Intellectual property rights</i>	Standards	<i>Privacy protection</i>
Government procurement	Professional/managerial ICT skills	<i>Trade and FDI</i>	Broadband	<i>Consumer protection</i>
Venture finance	Organisational change	International co-operation	<i>General network infrastructure</i>	
Innovation networks	<i>e-government</i>			
	Content			
	Government demonstration			

Source: OECD (2004), Information Technology Outlook.

The paper presents recommendations for possible policy actions based on the strengths and weaknesses observed in the Finnish policy approach. ICT diffusion to business policies covers both the traditional ICT policies like awareness-raising but also more general business environment policies like competition policies and finally policies focusing on developing small and medium-sized firms, such as publicly financed business services for development of ICT readiness of firms. The review does not, however, focus directly on broader aspects of Information Society policies aimed at citizens' and household's uptake of ICTs or participation in the Information Society. Furthermore, the review should not be seen as a comprehensive evaluation of the effectiveness of the most recent initiatives but as a guiding tool for facing the challenges and setting the priorities that new initiatives should address.

SUMMARY

Finland is well into the diffusion stage of the S-curve of ICT use in business (*cf. Information Technology Outlook 2002, 2004*). Levels of basic ICT “readiness” in business are well above the OECD average and ICT investment both in equipment and ICT skills remains high. However, good past performance may hide some problem areas such as significant sectoral differences in ICT related productivity and slow penetration of *e.g.* new wireless technologies in business use.

Overall, the Finnish ICT policy that has relied on market-driven diffusion, emphasising technology neutrality, has been successful. Now the challenge is to shift the focus of the policy towards efficient use of ICT, continuing to retain the technology neutral stance. There is still a need to establish, between various branches of government, that there is a market failure that argues for a more active policy to promote and guide SMEs to more intensive, strategy-based use of ICT. This report suggests that more emphasis be laid on ICT management and content development. Improving the co-ordination of different programmes and guaranteeing wide spread demand-driven use of ICT tools by businesses are also challenges that should be tackled. The following table summarises the analysis and recommendations developed in more detail in this paper.

Table 2. Recommendations

Policy domain	Current policy priority	This priority should be	Recommendations
Co-ordination of initiatives	High	Continued	Make sure that new measures for better co-ordination within central government enjoy full political backing. Currently, the company-oriented approach (based on the needs of businesses) needs to be strengthened along with the citizen-user theme. Increase coherence between different measures at different levels of government and regularise and improve policy evaluation.
Communication infrastructure and services	Medium	Increased	Increase competition in local loops and deploy affordable and innovative services <i>e.g.</i> in broadband services for SMEs. Guarantee competition between different broadband technology platforms. Ensure that benefits of infrastructure development are also sought for businesses – <i>e.g.</i> ‘the broadband for all’ strategy currently mainly emphasises promoting equality of citizens.
Equipment	Low	Continued	ICT equipment penetration in business is high particularly in sectors most amenable to IT use and does not require intervention, so continue the current policy of <i>not</i> offering subsidies or tax incentives for investment in equipment in firms.
R&D	Low to medium	Continued	Continue to support R&D of ICT and its applications through the development of general R&D support mechanisms (via TEKES). Ensure that the new SME ICT use support tool of TEKES is linked well with other schemes.

**Table 2. Recommendations
(Cont'd)**

Policy domain	Current policy priority	This priority should be	Recommendations
Public/private partnerships	Medium to high	Continued	Make sure that the existing network of P/P-partnerships is used effectively and strengthen co-ordination in implementing initiatives of various actors. Use the mobile cluster as a model of successful platforms meant for networking actors, piloting projects and developing standardisation. Study whether the private sector would need additional incentives or facilitation services to deliver transparent and competitive standards guaranteeing ICT compatibility, in particular for SMEs.
Skills: ICT in education and workplaces	High	Continued	Continue to invest in skills. Expand the key work place environment project (Tykes) to include ICT-based managerial and business processes. Make sure that company support schemes integrate ICT and management, seen from the companies' strategy perspective.
Restructuring of business organisation	Low to medium	Increased	Increase awareness among companies of the need to restructure business processes and ascertain that all schemes highlight the relation between ICT, management, skills and productivity, preferably in co-operation with trade associations. Consider introduction of a new analytical measure to provide deepened insight and piloting platform on restructuring business processes.
Incentives for content creation and multi-channel use	Medium	Increased	Treat content innovation no less favourably than technology. Promote awareness of the potential of multi-channel content creation and delivery. Speed up development of interactive e-government services for businesses on the already well functioning e-government platform. Ensure business access on competitive terms to public data that can be used for commercial ventures.
Trust/security	Medium to high	Continued	Ensure that the national information security strategy is implemented, paying special attention to tools for SMEs to meet privacy and consumer protection expectations.
Development of ICT skills in SMEs	Medium	Continued and reduced over time	Make sure that the regional business development network (TE-centres) throughout the country prioritizes ICT skills (both technical and management) and readiness issues in the provision of their services.
Reaching small firms	Medium	Continued or reduced	Improve reach by raising the awareness of subsidised consulting services which are easily available. Lower the threshold for companies to subscribe to these services. Make sure that business and ICT skills are mutually supporting in consulting provided, and that impartial consulting is available.

Source: Authors.

Evaluation. This report is essentially about evaluating policies. Monitoring and evaluation should be an embedded part of policy design according to e.g. OECD Good Governance recommendations. In Finland, as in most countries, there is room for improvement for systematic and comparable evaluation of different policies and measures. Although this can be an onerous process the benefits should clearly outweigh the effort in terms of improved policy coherence, greater transparency and more effective policy delivery through improved communication. In the Finnish system, with delegated competences and a

multi-stakeholder structure, this would seem to be particularly important. Evaluation capacity should be considerably increased when implementing programmes as complex as promotion of the Information Society.

Lack of systematic evaluation in the current implementation of Finnish policies promoting ICT diffusion in businesses is also reflected in this review. In some areas the review is inclined towards presenting a snap shot picture rather than results of policy evaluation that would demonstrate how clearly established targets have been met over a period of time. The dynamics of ICT market and technology development should lead to constant adjustment of priorities. This is also reflected in the way that this report is composed. This report attaches great importance to broadband technologies and markets in its analysis of policy response to new challenges. Broadband networks and their efficient utilisation will form a key platform in future development of the information society. All governments have a crucial role both in designing policies and in monitoring broadband development.

TRENDS IN ICT USAGE IN BUSINESS IN FINLAND

Finland is a highly industrialised country that has successfully expanded its industrial base in the course of the last two decades. As in its neighbouring country Sweden, but in contrast to many other European OECD countries, a limited number of large companies have played and continue to play a central role in industrial production and exports. Of a total of some 224 000 enterprises only 582 companies (0.3%) are large, with more than 250 employees but contribute to almost half of the total production. About 15 700 companies (7%) are medium-sized companies (10-249 employees) and the bulk of companies are small or micro companies with fewer than 10 employees. Fruits from determined investment in R&D in the 80s and 90s have ripened and are now being seen as new technologies, and a number of new companies have emerged and taken their part of production and exports. The electronics industry, with the telecommunication equipment industry as its flagship, has taken over the dominant position from the traditional leaders, wood processing and metal industries. Many service sectors, especially banking and insurance, have gone through extensive restructuring, but the service sector as a whole is seen lagging behind in efforts for increasing productivity. In order to achieve job-producing growth, strengthening the culture of entrepreneurship is seen as crucial.

Finland has been a forerunner in some areas of new technologies, such as first and second generation mobile communication. However, for some recent and emerging technologies, such as broadband, particularly wireless broadband and third generation mobile telephony, Finland unexpectedly does not rank amongst the top performers when comparing penetration internationally, a position it held with *e.g.* GSM and ISDN technologies. Finnish companies that are generally counted among advanced ICT users have been slow for instance in the adoption of wireless enterprise solutions in their business operations, which may have an impact on company productivity development perspectives. The risk of losing the top edge in adoption of new technologies and efficient use of ICTs across all sectors of the economy has recently given the Finnish Government reasons to sharpen its policy *e.g.* in the promotion of broadband use particularly in households and in government.

Business use of ICT

The diffusion of ICT to business in Finland compared to other OECD countries is well above average. Early liberalisation of infrastructure has contributed to efficient markets and a good supply of competitive and innovative telecommunication and information services. In a survey conducted in spring 2003, of all companies, 94% said they use Internet in their daily business. Fifty-nine per cent of companies, the smallest ones included, had a home page. Even in smaller companies employing five to nine persons, almost half of the companies had a homepage. The readiness of Finnish companies as to their equipment and access to broadband is on a high level: of companies employing more than five persons, 54% had broadband connection (**Table 3**). Practically all companies employing more than 100 persons, had broadband. Some differences between various sectors of economic activity can be detected. The construction sector seems to be lagging behind, and wholesale trade seems to be the most active of sectors. The service sector is well represented among top users.

The integration of ICT into business processes remains a key challenge for achieving productivity effects from ICT use as demonstrated by the ICT adoption s-curve (see *OECD IT Outlook 2002, 2004*). It seems that Finnish companies have generally swiftly adopted e-business, at least according to a recent Nordic survey (Ramsbøll: E-business Nordic.com 2003; Strategies and spreading of e-business in Nordic

enterprises). According to the report, e-business strategies are more advanced in Finnish enterprises than in their Swedish, Danish or Norwegian competitors. The integrated ICT strategy approach of Finnish enterprises was found to be more technologically oriented than in companies of the other Nordic countries. The study concluded that apart from applications in sales and sourcing, the Nordic companies were using the Internet widely for knowledge management, human resources management and other administrative functions. Ultimately, the issue of to what extent deeper use of ICT contributes to productivity remains unclear, however, as it could well be that companies which are already more productive have a tendency to make more use of ICT.

In Finland, according to Statistics Finland surveys, Internet sales were performed by 15% of companies employing more than five people and one quarter of those companies have their own home page. The amount of Internet sales clearly increased from 2001 to 2002. This increase was mainly due to growth in B2B, not from sales to consumers; B2C trade was about 10% of all Internet trade. Purchases via Internet are clearly more common than the capability of selling: of all companies employing 10 persons or more, more than half of them used Internet for purchases. Again, the wholesale, retail trade and post and telecommunication sectors are most active. The Construction and transport sectors are less advanced in that respect.

Table 3. ICT use by Finnish companies, Spring 2003

	All, at least 5 employees	Manufacturing	Construction	Wholesale trade	Retail trade	Business and other services
	%	%	%	%	%	%
Computer	97	99	92	99	99	99
LAN	66	74	42	84	58	80
Internet	94	98	88	99	95	99
Homepage	58	71	30	76	44	74
Broadband	54	53	30	70	51	76
ISDN	31	36	37	33	36	19
Modem	30	31	36	25	32	23
Intranet	26	27	17	33	22	39
Extranet	13	13	..	15	20	21
EDI*	6	9	2	16	9	2
Internet sales*	15	16	8	24	14	17
Internet purchases	51	50	39	60	48	68

Note: * In 2002.

Source: Statistics Finland, 2003, Internet use and E-Commerce in Enterprises.

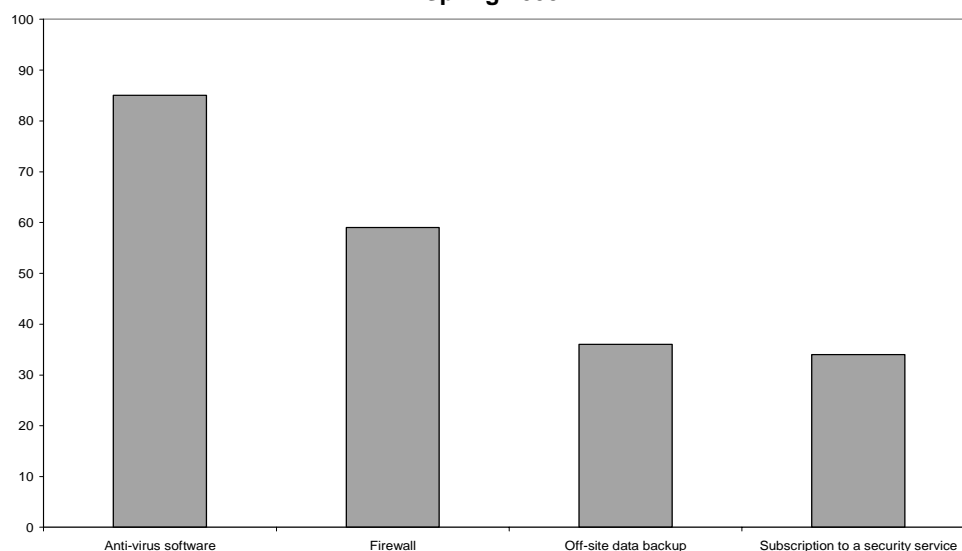
E-banking has played an important role in familiarising Finnish companies, irrespective of their size, with the daily use of Internet for business transactions. Today 85% of enterprises with Internet use it for e-banking. It is evident that the benefits in terms of increased efficiency and time savings have been attractive enough to entice the investment. Another important more recent contributor to the use of Internet by companies of all sizes have been the well-developed e-government applications. Development of eGovernment services has been a central part of business environment policy aiming at a reduction of administrative burdens. In Finland, companies withhold and pay taxes for their employees, pay and transfer various insurance and social security contributions and process monthly declarations, adding up to some 200 annual transactions per company even for SMEs. More than 50 000 companies manage compulsory information flows with authorities digitally, via the TYVI Internet system described below.

Awareness and use of information security tools is increasing. Anti-virus software is in use in 85% of companies and a firewall in almost 60%. More than one-third of companies use on-line security services. Off-site data back-up is used by one third of companies. The early development of a trustworthy e-banking infrastructure by the private banking sector also contributed to the creation of e-trust. Security problems have been practically inexistent in e-banking applications. E-banking has expanded to new applications

beyond finance. Banks provide the secure infrastructure for e-payments in e-commerce, but e-banking identification services are increasingly used also for e-government services. Companies do not need secure servers, which diminishes the relevance of their total number as an indicator of progress in e-commerce.

Available data suggests that practically all companies that are already using the Internet, and ICT equipment investments in general have been doing so at a high level, B2B commerce is developing quite rapidly and future challenges relate to more sophisticated and integrated applications of ICT. However, little data exists on the real impact on economic performance. More research using time series and more advanced methods should be carried out on productivity and other effects such as the impact of use of ICTs on organisational change. The nationwide company register that identifies business entities for easy follow-up and the willingness of Finnish companies to respond diligently to economic surveys perceived as useful, should support further and more thorough analysis of ICT impact on enterprises. Individual Finnish studies carried out thus far suggest that productivity impacts can be important but differ widely between sectors and different types of value chains.

Figure 1. Data security tools in enterprises as a proportion of enterprises with at least 5 employees Spring 2003



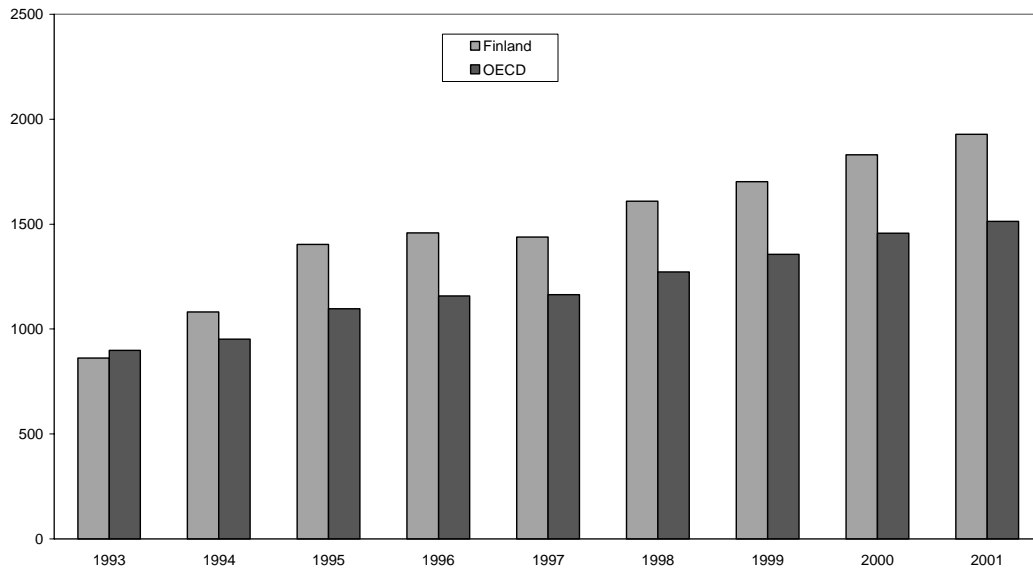
Source: Statistics Finland, 2003, Internet use and E-Commerce in Enterprises.

On a company level, attention is already shifting from visibility motivations – “be present in the Internet or perish” to productivity motivations: more global adoption of ICT particularly in business processes other than production and in networking should be seen as a tool for significant productivity gains *e.g.* in customer relationship management, administrative and financial processes. Value chain impulses naturally play a significant role in motivating SMEs to adopt e-business.

Business ICT spending

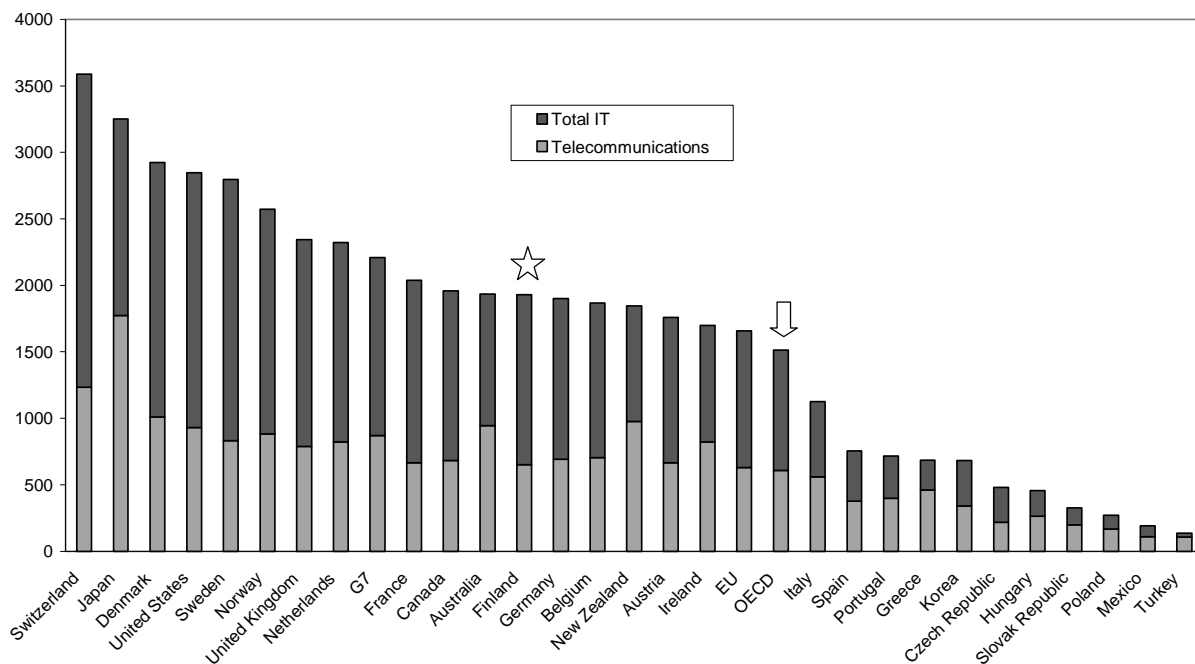
Figure 2a illustrates that Finland, in line with other OECD countries, invests in ICT at a rate which has constantly grown over the period 1993 to 2001. Finland’s total ICT spending is just above the OECD average. A snapshot look at ICT spending in 2001 seems to suggest that spending on telecommunications in that year was low in Finland in comparison with other OECD countries. (Figure 2b). Year 2001 was probably an exceptional one with low investment into telecommunication equipment. Most consumed ICT services in 2001, such as mobile phone and traditional Internet, were relatively competitive, whereas broadband use was less common and more expensive than in other countries, as will be discussed below.

Figure 2a. ICT spending per inhabitant (USD)



Source: OECD, based on World Information Technology and Services Alliance (WITSA) / International Data Corporation, *Digital Planet 2002*.

Figure 2b. Total ICT spending per inhabitant (USD): OECD countries 2001

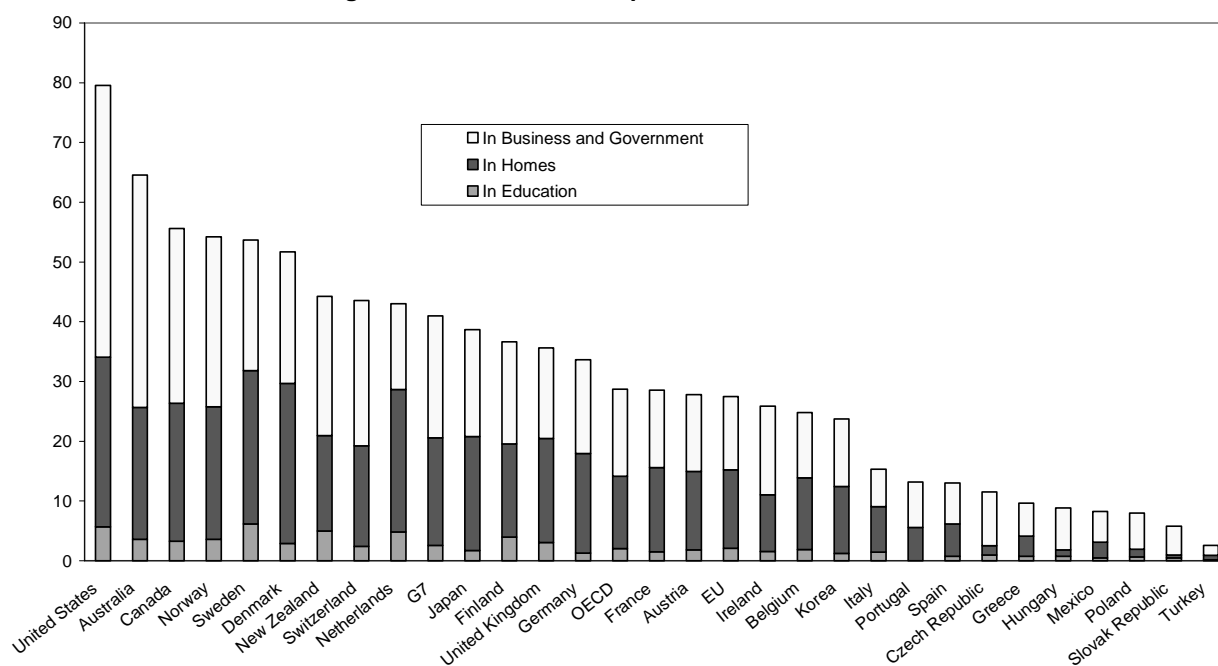


Source: OECD, based on World Information Technology and Services Alliance (WITSA) / International Data Corporation, *Digital Planet 2002*.

Business access to PCs

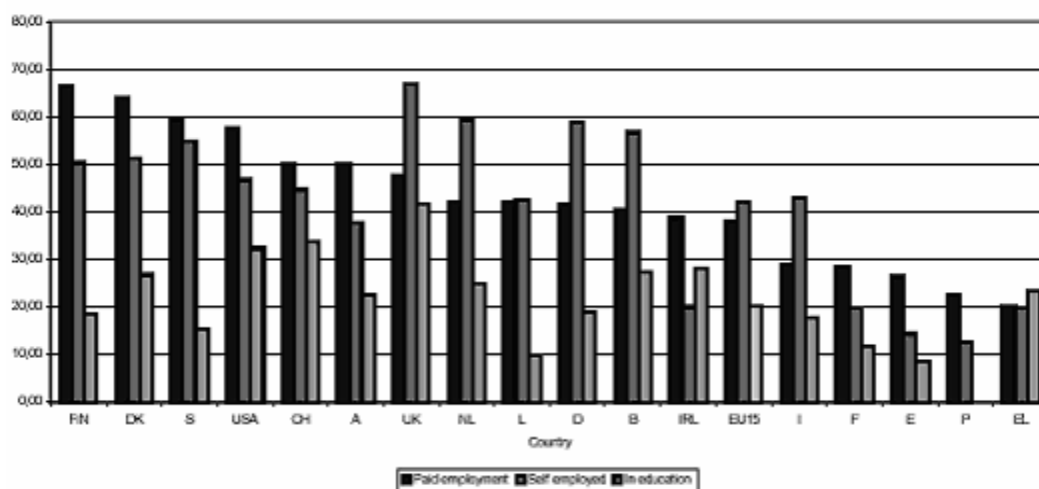
The number of PCs installed in education, business and private homes was 37 PCs per 100 inhabitants in 2001. This is about 25% above the OECD average. Finland has relatively fewer PCs in homes than in education and businesses when compared to the situation in other countries. In the business sector, in about half of the enterprises, at least one half of the employees use a company computer with Internet access and in one quarter of them all employees do. A liberal business culture supportive of ICT use has contributed to the fact that in Finland the use of company resources for private Internet affairs is at an internationally high level.

Figure 3a. Number of PCs per 100 inhabitants 2001



Source: OECD, based on World Information Technology and Services Alliance (WITSA) / International Data Corporation, *Digital Planet 2002*.

Figure 3b. Access to Internet services at work: ranked by access. Segmentation includes paid employment



Base: respondents using the Internet from work by employment status. Weighted results, EU15 weighted by EU15 pop. n=all respondents=11,832; EU15 n=10,306.

Source: SIBIS 2002, GPS.

THE FINNISH POLICY APPROACH

The Finnish policy approach towards adoption of ICT by companies has in many respects been "market-driven". This approach is built on the assumption that the search for better efficiency and productivity on the firm level itself is sufficient to promote a more efficient adoption of ICT. This is supported by an efficient innovation system which takes as a starting point that ICTs should be embedded, applied and used efficiently in the innovation process and in projects for which public funding is sought. The corner stones of the policy have been technology neutrality and promotion of convergence of technologies. High penetration of ICT equipment or at least individual devices such as mobile phones or basic Internet connectivity on both citizen and company level and continuing good positioning in international competitiveness and network readiness comparisons have created a general belief that "we Finns are doing well" which may have lessened pressure on new policy initiatives. This does not mean, however, that the national strategy would not continuously emphasise the role of new technologies and especially ICT. On the contrary, the strong industrial base, especially in the telecommunication cluster, has made it natural to see ICT as a core element in national technology policy. In public R&D investments, ICT has for long been one of the biggest sectors to benefit.

However, indications from past years reveal that the presumed good competitive position may be diluting in the course of coming years. The country that sometimes believes it is the information society No. 1 has not done everything it could have done and, according to recent comparisons, is lagging behind other countries in some respects. Development of the broadband and in particular Wi-fi (WLAN) market, 3rd generation mobile network, etc. are examples of technologies deployed more rapidly in the front-runner countries.

A recent benchmark study by OECD indicates that even though Finland is on a par with countries that have benefited most from ICT, it does not figure at the top in many business environment indicators (OECD, 2003c). As to "ICT endowment" Finland ranks ninth of all OECD countries. Its strengths seem to relate to ICT skills and readiness and e-government. Suggestions are made that both government and companies seem to have neglected some of the potential ICT offers in terms of applications of digital economy and society.

There are indications that the government is "sharpening" its strategy. In the platform of the Government nominated in April 2003 information society issues have received more attention, resources are to be co-ordinated better and policies will be more focused. The Government promises to pursue an active policy on development of the information society, with the aim of improving productivity and competitiveness and promoting social and regional equality through effective utilisation of ICT in society.

New goals are set in the overall Government programme, which includes four horizontal priority programmes. One of them is the Information Society Programme. The new Information Society Policy Programme reflects a worry about the gap between the opportunities that the existing infrastructure offers, on the one hand, and limited preparedness to make use of it, on the other hand. The programme enumerates eight fields of action. Promotion of electronic business and adoption of ICT among enterprises are part of an action labelled "Promotion of electronic business, e-services and digital content". However, the substance in this field of action seems relatively "narrow". According to this section of the Programme, the Government promotes the take-up of e-business and services by developing the environment of e-business in close collaboration with businesses and by advancing the use of e-invoicing and e-procurement applications. As part of the effort, the government promises to issue a report of the current status and future challenges of e-business. Based on the report, the government, together with the private sector, *may* draw up an e-business promotion strategy for making use of new technologies, new skills and new working methods throughout the business sector. The analysis of this report will thus be central to future priority setting in ICT diffusion to businesses.

No specific additional resources are allocated so far to the implementation of the strategy. The ministries have to find resources from their ordinary budgets.

Co-ordination

Even though the strategy regarding diffusion of ICT in businesses remains in many respects open, the need for better co-ordination has received a lot of attention. As some previous OECD reports (notably the report on regulatory reform) have also pointed out, a characteristic of the Finnish central administration is the very autonomous role of ministries which sometimes makes co-ordination a challenge. Similarly, the regional and local authorities have far-reaching autonomy and responsibility for *e.g.* provision of education and health and social services. A wide variety of different ICT pilot projects are run, engaging enterprises in work that promotes local innovation and tailored results rather than establishes or applies best practice – not to speak of ensuring interoperability with the ICT systems of neighbouring regions. This has also been the case in respect of implementation of the Information society agenda: ministries have not been fully aware of each other's activities. The new government puts clear emphasis on better coordination of information society policies. A horizontal information society council, led by the Prime Minister, has been set up. The council comprises members from relevant ministries and a wide representation of public and private sector actors. Below the council level, co-ordination has been strengthened. Also a remarkable additional step is the nomination of a "Programme director" for each of the four horizontal programmes including one on information society issues. The programme directors will be responsible for co-ordination of cross-governmental strategy and the implementation of their respective policy programme.

Developing ICT competence in SMEs

The traditional industrial competitiveness policy focused on improvement of the business environment and the enterprise policy measures directed towards the smallest entities traditionally employ different approaches. SME measures are usually integrated into regional policies. In the case of Finland, SME policy measures are largely supported by financing from the EU structural funds, channelled to autonomous regional authorities. These normally see that the government should promote change and adoption of best practices by giving direct guidance to enterprises. The ICT diffusion policy to enterprises stands at the cross-roads of these policy approaches. Commitment to an active ICT diffusion policy and the policy approach employed may vary within ministries and across the administration.

The role of various actors in Finland in building company competences with regard to ICT use can be illustrated by the framework shown in Table 4, constructed in the Ministry of Trade and Industry. The main goal of the table is to further a consensus on the needs and roles of the different private and public actors when looking at ICT competences in a framework for enterprise policy. The actors are divided into four categories; peers, market-based actors, subsidised actors, and formal public actors. In raising general awareness of ICT potential, all actors have an important role; impulses from other market operators in the value chain probably have the greatest role (Column 1 in Table). In building ICT skills both at individual company level and in the society at large, authorities and various service providers are the most important actors. Strategic vision on the potential of ICT use in most cases is born from impulses from the market. Authorities and consultants play a secondary role in that respect. Once a company has a vision on ICT potential it needs to restructure its operations; authorities and subsidised services hardly can play an important role in respect of the bulk of companies, instead, market operators and consultants provide most of those capacities. Using best practices as a marketing tool is best suited to public authorities and subsidised services.

Table 4: The role of various actors in inciting and facilitating the use of ICT in business

ACTOR	Peer networks, trade associations, supplier/customer impulses	Commercial service providers (consultants operators)	Subsidized service providers	Authorities (national, local)
COMPANY COMPETENCE				
General awareness of ICT potential	XXX	X X	X X X	X X
ICT skills	X	X X	XX	X X
Strategic vision on ICT use	X X X	X	X	X X
Capacity to carry out organisation restructuring	X X X	X X	X	X
Company specific business case for ICT use	X	X	X X X	X X

XXX = Very active role.

X = not an active role.

Source: Finnish Ministry of Trade and Industry.

Market competition in telecommunication

Finland was one of the first countries to liberalise the basic ICT infrastructure. The results of this policy were visible in terms of rapid deployment of emerging technologies such as mobile phones and Internet. The market structure consisting of numerous local operators contributed to innovative provision and use of technology and the markets have been functioning efficiently. Finland has been a test bed for several new technologies, both foreign and domestic.

The Finnish Communications Regulatory Authority, *Ficora*, together with the Finnish Competition Authority, is responsible for promotion of effective competition in communications markets. One of *Ficora*'s major responsibilities according to the new Communications Market Act (entered into force in July 2003) is the evaluation of a competitive situation in the communications market and determinations of operators having significant market power. *Ficora* defines SMP (significant market power) operators and sets special obligations for them as required by law. Systematic data collection is being established in order to define the relevant market.

Contrary to the rather competitive mobile phone communication pricing, the price situation for fixed lines is seen as unsatisfactory. In an OECD comparison Finland ranks ninth for the composite basket of business telephone charges and twelfth for residential telephone charges. The local loop remains the main problem. More than 40 local operators remain factual monopolies for local fixed lines. The law requires transparency and fair pricing. *Ficora* and the Competition Office have been active in forcing companies to adjust their pricing and other conditions in line with the legal requirements, but obviously there is still room for reaching the goals of the legislation. The fact that there are no reference prices available for international benchmarking of leased lines is exceptional within the OECD. Probably the enterprise sector does enjoy competitive service offerings and list prices do not play a major role. OECD experience suggests, however, that all price information contributes to increased transparency and better functioning of the markets. Thus, it should be in the interest of the Finnish authorities to promote publication of such market information.

As part of the eEurope 2005 initiative of the European Union, all 15 EU member states were expected to draft a national broadband strategy by the end of 2003. Finland was among the first countries to adopt such a strategy by a Government resolution at the end of January 2004. The Finnish broadband strategy relies on the market to provide access to broadband for most citizens. No additional funds will be allocated to building the infrastructure, nor to support operators or end users, but special measures may be taken to ensure availability of broadband in remote areas with insufficient commercial offering. However, special attention is paid to improved broadband connectivity of schools and libraries. The corner stones of the strategy are enhancement of competition

through intensive market surveillance, stimulation of demand through development of content, with eGovernment services as a key area, awareness-raising activities and improvement of information security. In this respect, the national strategies on broadband and information security share action points. The national broadband strategy sets 1 million subscribers by the end of 2005 as its main target. The strategy stresses technology neutrality, but concentrates on competition problems in the two currently leading broadband channels (ADSL, cable TV networks).

One factor which may have slowed down the introduction of competition between DSL and cable broadband technologies is the telephone operator ownership of cable TV networks. OECD analysis has established that this common tendency in the Nordic countries produces a structural impediment for effective competition between technology platforms and has resulted in higher prices and, consequently, slower development of broadband use. There are, however, signs of emerging competition across different technology platforms, through *e.g.* provision of broadband WLAN services by municipal electricity companies. Whilst new entries will introduce innovative and competitive solutions to the markets, it is important to guarantee that cross-subsidies do not distort markets. Ongoing OECD work suggests that new technology, in particular wireless, is bringing substantial improvement to broadband availability and speed in rural and under-served areas, whereas this may not be very visible in Finland yet. Overall, broadband price and quality of service levels should reach those in more competitive OECD markets through interplay between different competitive forces. These issues are addressed in the recent Government Broadband Strategy, including the target of bringing Finland to the European forefront of fast telecommunication use and availability. Consistent political support for statements and concrete measures introduced by Ficora and the Finnish Competition Authority one important for bringing more dynamism to the markets.

Specific initiatives

R&D support measures

Finland has been increasingly investing in research and technological development. R&D investment totalled 3.5% of the GDP in 2002. The private sector share accounted for two-thirds of all investments. The results of a continued high level of R&D investment are clearly visible in the structural change of the industry and in the wide range of Finnish high-tech exports. The electronics and electrical industry now represent the third strongest supporting arm of the Finnish national economy, alongside the forestry, metal and engineering industries.

The National Technology Agency of Finland, *Tekes*, is responsible for awarding most public R&D funding. Tekes' role is to ensure the competitiveness of traditional industrial clusters, and at the same time promote emergence and growth of new industries. Tekes' strategy outlines eight competence areas. Of these, three are defined to be core competence areas: ICT, biotechnology and material technology. Applications are seen to be crossing various themes and thus to be complementary. Thus, in biotechnology, for example, ICT applications are used to a growing extent. As another example, applications of ICTs are of growing importance in health care service business applications. The current estimate is that in two-thirds of all projects getting R&D financing, adoption and use of ICT is involved in one way or another. In Tekes' policy, however, ICT is not only seen as an industry. It is seen as a means for increased productivity and as such expected to be present in most innovation projects.

ICT is seen as a central driver for change in the economy and in the society as a whole. It is expected to be present extensively in products, systems and services. Networking between companies and especially SMEs is an exemplary feature of the new economy that is identified in Tekes' strategy. This is realised mainly through ICT.

Box 1. New financial instrument from the National Technology Agency of Finland, Tekes

“ICT in support of Business” is a new service from Tekes. It is aimed at providing financial support for SMEs for planning at a firm level how to make best use of ICT. It does not target the first phase planning but rather advanced planning before the adoption stage. Companies applying for this service are typically expected to have undergone e-assessment and preliminary planning stages such as e-Askel described below in Box 4. Financing can cover an ICT project plan including for example determining specifications for software. Mainly consulting services are eligible for the subsidy.

Interoperability

Increasing demands for interoperability in the networked business environment underline the importance of standardisation. Both the established technologies and new services require substantial improvements in compatibility and integration between systems and solutions. The government has established that this task should mainly be left to the private sector. However, in connection with efforts to strengthen co-ordination of information society related policies, the question has been raised whether and how the government should contribute to establishment of appropriate fora. In particular, guaranteeing SME interests in standardisation remains a challenging goal. Giving the right incentives to guarantee SME representation and public-private partnership models are amongst the appropriate tools.

The government has provided some financial support for various pilot projects on mobile platforms and for developing business-models for *e.g.* location-based mobile services. Building networks between public and private actors is an essential component in such projects. The mobile cluster is a good example of a platform that assembles industry interests and discusses leading-edge applications. Currently, following an industry lead initiative, Tekes is financing a project called RUBIC (Research on Business Information Community) that brings together some 50 large industry and service sector enterprises to look at possibilities to develop an integrated platform for business processes of the industry. The project has started with a sectoral assessment on how Finland currently stands in development of eBusiness interoperability. Again, it seems important to pay particular attention to how the user and SME interests should be channelled in such work.

Tax rules for equipment

The position toward ICT reflected in tax policy can be described as neutral. As for tax-related measures, there are no specific rules or tax exemptions for ICT investment at the company level or for households. Nor are there public subventions for such expenditure. This is in line with long standing policies in respect of public subsidies to companies: they are mainly used for R&D and training and consulting and improving the business environment in general. In Finnish tax policy thinking, the principle of neutrality is enhanced and deviation from that would probably necessitate very clear evidence of market failure.

Skills

Finnish companies are deemed to be in a relatively strong position with regard to their competences to make use of new technologies. Skills and readiness of the staff are at a high level. Finland ranks among the best performers as regards to ICT training and skills in schools and working places. This has been a priority in the Finnish policies for a long time and incontestably shows results. The general high level of ICT skills among employees reduces the needs for company-specific training programmes, but publicly available individual training is encouraged in many companies. Generally positive attitudes towards new technologies among employees have facilitated the adoption of ICT in work places. Readiness based on workers' skills and attitudes seems to be an excellent platform on which to build more sophisticated systems at the company level. In spite of a good situation already, the skills issue continues to figure among top policy priorities. The new government is going to launch a programme “Developing a

programme for working life” (TYKES) with substantial financial support measures aimed at developing company-level best practices for combining greater efficiency (more efficient use of ICT being one of the means) with a better working environment. Here the need for a more efficient working environment arises not only and not even primarily from economic reasons but also from demographic trends; Finland is simultaneously facing relatively high unemployment levels and a looming workforce shortage due to an ageing population. However, the goals match well with one another and efforts support the basic goal: rethinking the way of operating in the work place whether it is a company or a public sector unit.

Content creation, public procurement and e-financing applications pull through

In Tekes funding, the share of projects involving the development of innovative content products is increasing. While many of these are based on rapid and innovative application of new technologies, increasing attention is paid to market research and anticipation of target audience behaviour and applicable business models. This has required a broader view on funding criteria than the general criteria applied for purely technical R&D projects. Various multimedia, game and other mobile applications have thus far been among the leading content sectors receiving support. Multi-channel delivery of content is increasingly a requirement in digital content-related projects. While privately offered services based on public domain information, such as geological, cartography, meteorology or public archives are growing, Finland shares with other countries the unsolved issue of pricing and access to public information for business purposes currently discussed *i.a.* in the European Union.

In the Finnish debate, more and more emphasis has recently been put on the role of the public sector itself as a partner and user of ICT. On the private side, the creation of an electronic interface between public and private sectors for public services are seen, by many analysts, as the most genuine and effective measure to promote use of ICT. An example of the government’s efforts to create such an interface and at the same time, facilitate the bureaucracy requirements imposed on companies, is the TYVI-system that supports enterprises in their dealings with the authorities. This work needs to be actively continued.

Box 2. TYVI – information streams between businesses and to public authorities

Finnish companies can submit compulsory reports such as VAT, customs, statistical as well as pension insurance reports on-line to authorities and pension insurance companies using the TYVI - system. Reporting is free of charge for the companies.

A recent study by the Helsinki Chamber of Commerce addressing 500 member companies found that SMEs are familiar with online reporting to authorities. 59 % of SMEs had started to use e-reporting or e-forms with the tax authorities. 47% report to pension insurance companies online.

Two years ago, in a corresponding study, 60% of SMEs felt that they had too little information on e-government services. This year, only 33% felt so. In 2001, 45% of the respondents found it cumbersome that the databases needed for reporting to authorities were not integrated to other information systems of the company. This year the share was 31%.

However, electronic banking systems have been the most crucial promoter of use of ICT and have paved the way for other electronic applications in businesses. Sophisticated applications, their usefulness and trust in security have eased adoption of banking applications. Thus, e-banking has materialised as the primary tool in learning the methods of e-business. This is especially true in the case of SMEs which have no experience of EDI messaging, the traditional B2B electronic data transfer system. Almost all companies including SMEs use e-Banking. According to surveys among SMEs, e-Banking is one of the most common reasons to use Internet.

However, also in e-Banking, most of the potential has not yet been exploited: *e.g.* electronic invoicing is still in its infancy. E-invoicing is expected to grow as experiences from large companies and public authorities on e-invoicing in their in-house trading show remarkable cost efficiency gains and the number

of entities, particularly SMEs, engaging in e-invoicing reaches a critical mass partly due to pressure from larger enterprises and encouragement by other actors such as banks.

In central government, a goal has been set to make e-invoicing a reality also within the administration: by 2007 half of all government branches, including universities, should be ready for sending and receiving invoices electronically. At local administration level, awareness is growing about the potential for savings that e-invoicing brings: within the administration in a medium-sized town, constant savings close to 50% have been realised thanks to electronic handling of invoices received.

Box 3. Forum for e-invoicing by Finnish information Society Development Centre, Tieke

Together with a number of market actors Tieke is promoting, the adoption of electronic invoicing systems. The organisation hosts a public-private forum on e-invoices and maintains a list on its Web site of companies ready to receive/send electronic invoices. The list currently contains some 1 000 companies.

Invoicing via electronic media has been quite common among bigger companies for decades thanks to EDI: while quite unknown to the larger public and smaller companies, the number of EDI invoices is estimated to be close to 40% of all invoices between companies. Electronic invoicing, however, is believed to make a breakthrough among SMEs only via Internet, due to easier applications and use.

The Tieke forum for e-invoicing embraces "pioneer" market actors such as operators, banks, software houses and bigger companies interested in the practice.

The public procurement market is another significant interface for electronic applications between public and private actors. The potential of the electronic public procurement market is far from being exhausted. A big challenge ahead is to introduce more interactive e-procurement applications. Work is underway to develop electronic model documents for procurement. Well established European and national rules for public procurement and, more specifically, for mandatory invitations to tender by the state, municipalities and other public authorities, have served as a trigger for companies to adopt the Internet as an everyday business tool. To complement the electronic public procurement platforms at the EU level, electronic media for procurement on the national level (JULMA) have been developed. Thousands of companies are already keeping an eye on the electronic procurement market and a significant number of companies make use of it in participating in bidding contests. KILPANET is another recent initiative for establishing an electronic market for public procurement of services.

Trust and security

Information security is a significant element of the infrastructure. Securing information comprises of rules and technological solutions. As is well known, lack of trust in the security of information on the Internet has been one of the essential hindrances to the expansion of its commercial use.

The Government has adopted a National information security strategy in September 2003, making Finland second only after the United States to formulate an information security strategy on a national level. The starting point of the strategy is that development, competitiveness and privacy are largely dependent on the nation's capacity to protect its national information. In short, a national vision for information security embraces the following main goals:

- Finland is an information secure society where everybody can trust security information, secure communications and management of data.
- Information security is a horizontal issue present everywhere; it is also a question of awareness and an information security culture in a larger sense. In companies and other organisations this attitude needs to be adopted at all levels of management.

Information security is also identified as an element for improving national competitiveness: societal development and economic competitiveness are enhanced by supporting availability and usefulness of information; it also promotes innovative commercial solutions.

Building the information security strategy is a national project necessitating a broad consensus. To this end, the government has set up a National board for Information security, an advisory body reporting and making proposals to the government for updating and implementing the strategy.

A strategy project can be seen as an ambitious and efficient way of building a national consensus on the best ways to improve information security in the society as a whole. The Finnish national information security strategy includes a large number of specific actions to be implemented in the field of awareness raising, availability of user-friendly technical solutions and services for information security and promotion of behaviour to enhance information security.

Protection of personal data is a central issue in Finland in building trust in the digital economy. The EU legislative framework lays the foundation for the policy. The implementation of the national law has given rise to several recent and visible cases dealing with protection of mobile phone log data. Currently, the issue of protecting the privacy of personal e-mails exchanged over the infrastructure and equipment provided by the employer is lively discussed, and it looks as if protection is at an exceptionally high level when compared with practices in other countries.

Consumer protection is an important trust-related issue for the growth of B-to-C commerce. On its Web site, and in its printed material, the Finnish Consumer Agency offers information on consumer protection both to consumers and e-shops. In addition to local legislation, the Agency presents the *OECD Guidelines on Consumer Protection*, examples of applications of the Guidelines, and joint Nordic statements on consumer protection. Special emphasis is laid on the position of children in e-commerce. In addition, Tiekke (Information Society Development Centre) in its newly revised e-commerce manual for e-shops, the 'ABC of Internet selling', has expanded sections on the legal rights and obligations of parties to e-commerce transactions. Privacy issues are also addressed in the information given.

Awareness-raising and e-business promotion initiatives: E-step and others

Technology-centred innovations do not integrate easily with business management to the extent possible. This is the case especially in SMEs. However, in Finland, this cannot be explained by lack of supply of relevant e-business readiness initiatives. Rather these initiatives seem not to have raised the expected interest from SMEs.

- Initiatives of various actors can be divided into national, regional and sectoral initiatives. National initiatives are mainly designed by the Ministry of Trade and Industry and implemented by the regional offices of the Ministry, TE-Centres, (Employment and economic development centres). The TE-Centres provide training and consulting for ICT preparedness. *E-step* below is an example of a national initiative.
- Regional initiatives are normally outcomes from "consortia" of various regional actors from the public and private sectors. *Karelttek's eBusiness for SMEs* mentioned below is an example of a regional initiative.
- Sectoral initiatives are targeted at specific business sectors. The *Craftnet* project described below is an example of a sectoral initiative.

One specific problem in consulting related to ICT diffusion is the limited competence of consultants serving the SME sector: consultants tend to be ICT specialists with limited knowledge in business management or "pure" business development consultants without particular skills in ICT. This is often the case also in Finland. Consulting should be focused and developed from the viewpoint of customers' needs.

Two important groups of clients stand out: those focusing on the use of ICT tools, and those who wish to apply the tools as part of their overall business strategy. A pertinent question is how to move from the first target group to the second, also given the generally high business ICT use and information available throughout the business community.

Box 4. Policy examples

Easkel ("E-step"):

E-step is a programme developed by the MTI enterprise policy unit and provided by the government's regional business centres (TE-Centres). Its focus is on evaluating the e-readiness and needs of companies using self-assessment forms and consultant assistance. The programme is designed to support enterprises to develop e-business plans. The programme uses a network of trained and certified consultants recruited from the private sector. The government provides a subsidy that reduces the consultancy fee.

The demand for the programme among SMEs has been a disappointment. Some specialists estimate that the programme (one of 15 'packaged' programmes of TE-Centres aimed at developing various aspects of SMEs competitiveness) is too technology-oriented and in their marketing too little emphasis has been put on business management. In autumn 2003 new efforts were made to develop and market this service further with the aim of strengthening the links of ICT potential to the overall strategy of individual interested firms. E-step is linked to another e-business promotion tool, Verkkokaveri ("Netfellow"). Verkkokaveri functions as a Web-based service that provides information to companies on e-Business development. It features "success stories", lists regional e-Business promotion initiatives, links to e-Commerce manuals and other resources and generates awareness for E-step.

E-business for SMEs

The main task of Kareltek, a private association embracing mainly private actors but also some public bodies, is to promote new business activity in southeast Finland. The technology centre offers an operating environment: business premises, basic services and development services, as well as innovative co-operation partners. Kareltek operates in close co-operation with the neighbouring Lappeenranta University of Technology and other training and research units in the region.

The 'e-Business for companies' project is an example of projects co-ordinated by Kareltek and targeted particularly at SMEs in the region. It aims at helping companies in their business by adopting new ICT (mainly software) applications and services. The project offers an online e-readiness tool and a matching service for helping ICT solution providers and SMEs to find each other. It also illustrates the step-by-step approach preferred by SMEs in adopting ICT tools by breaking down concepts and acronyms such as SCM (supply chain management) and ERP (enterprise resource planning) into components easily understood by SMEs. An innovative aspect of the project has been presenting the subsidy for training costs in adopting new systems and software in the form of an 'e-Voucher'. This has raised great interest among micro-enterprises. Other participants in the project are a local chamber of commerce, local entrepreneur organisations, local university and regional development organisations. The project is financed by European Social Fund and regional TE-Centre.

Craftnet

Skills Craftnet 2000-2003 targets handicraft and design companies and consultants advising such SMEs. The project aims at developing SMEs skills in networking and in the use of ICT in marketing, sales, sub-contracting and maintaining skills. The project aims at developing new teaching methods in an Internet environment and at improving competitiveness by promoting networked business tools of the companies. Methods include teaching and tailored consulting. The project also provides a virtual learning forum for participants.

Craftnet is partly funded by the European Social Fund.

Evaluation

The overall picture of the impacts of various measures, presented above, is based on isolated observations rather than on focused and co-ordinated evaluations. Sectoral analyses and evaluations have been carried out but the success of ICT diffusion programmes as such has not been the target of the evaluations. Some regional ICT programmes have been evaluated but the main focus has been on the effects on local employment. Evaluation of R&D programmes has a long-standing tradition but thus far that has been based on technological and cluster creation merits rather than on diffusion impacts. Evaluation of ICT impacts as such can be expected to be strengthened following the efforts to co-ordinate the information society policy issues in a more horizontal way.

CONCLUSIONS

The Finnish policy approach to making the best use of ICT in business, and especially in SMEs, seems to rely on the competition expected from a well-functioning market. The corner stones of the policy have been technology neutrality and expected convergence of ICT applications. As regards information society issues as a whole, the main emphasis by public authorities has been on ICT skills among workers and youth, networking of educational institutions and e-government. Consequently, Finland ranks well in these areas. Generally positive attitudes and the traditional eagerness among Finnish companies and citizens to adopt new technologies have paved the way.

Positive attitudes of authorities towards promoting competition have been an asset for a long time. Searching for further room for liberalization in the telecom markets is already a tradition. Market-oriented communications legislation which entered into force this summer is in line with European directives. Opening local loops remains a target for the market regulator in implementing new legislation.

The improving access to ICT and strengthening competition have kept the discussion on infrastructure calm. Goals set by the new government for broadband focus on the availability of connections to all citizens. The issue of broadband access and transmission speeds of connections offered to companies have received less attention.

Awareness among decision makers of some weaknesses in the adoption of ICT is growing. Recent data on the level of adoption of ICT, particularly in application of technologies, commercialising their results and ICT-related productivity in many branches of industry and service sectors, and the tightening international competition for leadership rank in the development of the Information society as a whole, has awakened the decision-makers and new attitudes can be noticed.

The central government's efforts are going to be more concentrated. Raising the information society issues among four core strategy areas of the government is proof in itself that there is a need and room for action. Setting up a ministerial group for Information society issues, chaired by the Prime Minister, and the nomination of an information society policy programme director at the Prime Minister's office, indicate a pursuit of a better co-ordination between various ministries. However, several issues could be addressed further. First, the government has not allocated additional funds for implementing the information society strategy. Of course, this may be temporary and be explained by the early term of the Government. Secondly, from the e-business issues point of view the recent programme document is rather light. Issues relating to the adoption of ICT among SMEs seem to get less attention: the general impression from the document is that the emphasis is on administration-citizen relationships and ICT use.

Lack of co-ordination among authorities has contributed to slowing down the adoption of integrated ICT applications in several public services sectors. The public health care sector is the clearest example of a number of autonomous actors without adequate coordination: municipalities and hospital districts have their own specific ICT applications which are not compatible. The situation may only be improved by relying on a more centralised approach. Experiences from e-banking on how confidential information can be secured to the maximum could help create a climate of trust in increased networked patient information handling.

The level of interest among companies in awareness-raising and training campaigns has been a disappointment. The number of campaigns available, especially to SMEs, is not low but there is room for improving their attractiveness and visibility. New campaigns marketing public training and consulting services are underway. But a deeper awareness is needed: understanding technology's potential for business management at the company level is a challenge and the core issue for SMEs. Criticism has emerged that there are many SME consultants who do not always understand this.

The significance of broadband is an issue with many different interpretations. Basically, broadband connections are available for most households and SMEs willing to take one. According to the Ministry of Transport and Communications, 85% of households have broadband access in their area. The penetration has not developed equally favourably. Prices are relatively high, the quality of service less advanced than in a number of other OECD countries and the availability of content services may not meet expectations.

On the company level, especially in SMEs, there are still mental obstacles. Profits from ICT business applications are not always easily seen. Costs for new applications are or are perceived to be too high. Benefits seem to be too distant. Successful restructuring combined with efficient use of ICT can bring about significant productivity outcomes as indicated in a recent Finnish study. On the other hand, intense competition provides a real downside for not adopting ICT, *i.e.* firms that do not keep up with the technological developments, may be forced to exit (Maliranta and Rouvinen, 2003). Are firms aware of that? This is a challenge for awareness-raising projects rather than for the authorities. Also, it is realistic to presume that some companies benefit more than other companies, depending on the sector in which the company is doing business. A major conclusion from a Finnish study made among the SMEs in the Helsinki region is, however, that most companies have expectations of remarkable benefits from ICT use and e-business (Helsinki Chamber of Commerce, 2003). On the other hand, even among those companies which already conduct business by using ICT applications, all the benefits are not clearly seen.

Strengths

- The availability, use and integration of ICT in business processes of ICT is above OECD average.
- Telecommunication infrastructure, including access to broadband services, is of good quality, readily available and for the most part, a highly competitive sector.
- Attitudes among entrepreneurs and other stakeholders are generally positive toward the adoption of new business tools even though this might result in temporary negative impacts on employment.
- Well developed e-banking infrastructure and its use by practically all companies has paved the way to everyday use of Internet by firms, including the smallest firms.
- E-government, which has received recognition in recent OECD comparisons, has also contributed to Internet use especially among SMEs, permitting for example ordinary tax declarations etc. via the Internet.
- Skills of people in general and workers in particular are at a high level and employers, employees and public authorities continue to see skills as the primary asset in building a more efficient information society.
- Mobile platform gets a lot of attention with regard to potential new applications for mobile business but wireless Internet technologies such as Wi-Fi seem thus far to have been overlooked.
- Co-operation between stakeholders for drafting and adoption of common standards for e-business is intensifying and enjoys the moral support of public authorities.

Weaknesses

- Measures for strengthening the co-ordination within central government have received attention only recently; lack of co-ordinated efforts among regional authorities (TE-Centres) has led to an uneven approach from one region to another.
- There is some ambiguity on policy content and government roles between different policy communities. Analysis of the business environment development and its implications for industrial competitiveness policy suggests that no intervention is needed to promote ICT use in enterprises. Traditionally, local SME initiatives take public sector interventions as given. A well established ICT diffusion policy will need to strike a balance and should strive towards a consensus on the roles of different actors.
- Positive impacts of ICT use in business and e-commerce have not been seen on a higher political level as area for major policy measures; rather, public policy measures have targeted “Internet for all” issues.
- ICT diffusion has not received sufficient attention in policy programmes and co-ordination; results have been quite modest in passing the message to the bulk of SMEs.
- Intensive use of portals, e-banking, e-government applications and, to some degree, e-procurement and e-invoicing applications may have led to satisfaction with the current state of affairs, and the search for more sophisticated applications of ICT use does not seem to be a high priority.
- Competition in local telecom markets remains limited and innovative deployment of new technologies is slow. The business sector enjoys more competitive supply conditions but increased price transparency and benchmarking would contribute to stronger market dynamism.

Recommendations

Ensure political support and co-ordination at the highest level. The approach to national co-ordination and implementation of programmes adopted by the recently appointed government seems to underline the readiness to define and meet the future challenges of various aspects of the Information society. It shows that, instead of being too complacent with what has already been achieved in terms of ICT use and diffusion, the society and government are ready to stay alert to future demands. International comparative data, such as OECD analyses on productivity, technology deployment and structural transformation, form an important political instrument in this respect. In order to implement the strategy of the new government, continued political support and also resources are needed. However, the strategy itself and the state budget for 2004 do not indicate any additional resources. Nor is there any indication where additional new inputs, if available, would be needed. There is a clear effort to improve horizontal coordination between various actors, especially various ministries. Consequently, in addition to top level support, there should be comprehensive commitment throughout the administration. New bodies for information society issues have been established on political and administrative levels. Interested circles are well involved in policy planning and execution of policy measures. This is especially the case at the central government level. Close co-ordination and agreement on the basic strategies between the Information Society and the Entrepreneurship program – the latter being one of the three other horizontal programmes – is very important in designing subsequent policy priorities. Co-ordination of policy implementation on the regional level needs attention; action (TE-Centres) to define and implement policies varies from one to another according to their own priorities.

Continue market-driven measures to build out the infrastructure. Statistics show that business investment in ICT is high, in particular in sectors most amenable to ICT use, and does not require public intervention. The long-standing policy priority on building workable market conditions has borne fruit: market competition is robust with the exception of the local loops where the competition authority still has work to do. From the ICT diffusion point of view the priority should now be shifted to ensure that benefits of infrastructure development are also sought for businesses – e.g. the “broadband for all” objective is based on equality between citizens rather than on business needs arguments.

Maintain active R&D support measures. Public support to R&D is a dominant part of all support measures at least in terms of expenditure. ICT use is emphasised in all public R&D measures, either directly or indirectly. There is limited room for new measures to help companies in adopting ICTs and making better use of them. The support measure recently established by Tekes to support adoption of ICT among SMEs is one important effort to fill the gap. A thought should be given to whether Tekes’ toolbox needs to be expanded further to cover ICT use to a larger extent.

Expand Public/private partnership. One relevant problem is fragmentation of the overall picture of support measures of various actors that the Verkkokaveri Web service is now addressing. More importantly, the roles of different private and public actors should be systematically assessed. The schematic presentation (See Table 2) could form the backbone of a deepened public-private partnership model that would look into enterprise development barriers and the natural sources for their solution. Make sure that existing networks of public-private-partnerships are used effectively, in particular in standardisation work. Continue to use the mobile cluster as a model platform for development.

Continue to invest in skills. This is particularly important in the central area of management training and skills. Whether some of the resources of the work place development project (TYKES) programme should be allocated to management training should also be assessed.

Consider introduction of specific measures to promote restructuring of business processes. Companies get main impulses to rethink their business processes from markets and various actors in their value chain (see Table 3). Similarly, motivations to launch various forms of e-business are based on market analysis. The role of authorities and supporting services in inciting business reprocessing can only be secondary and complementary. However, especially in the case of SMEs, public schemes which are designed to help companies to “innovate” new ways of doing and organising business (e.g. E-Askel) can lower the threshold for seeking advice, planning and – eventually – implementing new business strategies. Quite modest use of public measures so far should not lead to reducing these measures. On the contrary, more efforts should be made to expand and market the use of promotion schemes.

Promote content creation and supply-demand interplay to drive broadband deployment and use. The “chicken and egg” situation in broadband development – no investment in service development because technology deployment is slow and vice versa – can be broken through innovation and demonstration. Government services, discussed below, are one dimension in providing content. Incentives to competitive multi-channel content ventures, making use of competition between various fixed and mobile technology platforms, (the terrestrial digital television broadcasting network being one of the platforms), should receive further attention, with content innovations treated no less favourably than technology innovations. Demonstration of lowered investment thresholds through use of new technologies and downward prices will attract further investment in content and services. Efficiency-improving services in the enterprise sector are readily welcomed and adopted as shown in the case of eBanking services promotion schemes. The new broadband strategy adopted by the Government in early 2004 offers a variety of targets and measures addressing the challenge. Reaching the targeted position as European frontrunner will take active promotion measures and dynamic market developments, duly foreseen in the strategy.

Expand eGovernment services. Finland has very high rates of e-government services. Recent assessment by OECD shows that country's national e-government vision is well integrated within its administrative reform and information society agenda (OECD, 2003b). The focus has been on service quality, relevance and access. Their importance can hardly be over-emphasized: it plays important role as a driver especially for SMEs in adopting ICT tools. Like e-banking services, government services online can be first to incite companies to interactive use. Thus, government should assess its portfolio of current interactive online services and prepare to extend it. Its indirect positive impact can be much bigger than the direct use of government services. Electronic banking applications, the use of which has reached an overwhelming share of companies, including SMEs, has proved the key first "everyday application" of Internet. Shift-over of traditional practices necessitates examples and "pressure" from large companies; electronic invoicing is a major application for the expansion and adoption of ICT. More push from the government side seems to be needed for expanding the use of e-invoicing, also in the private sector: various operators seem quite slow to find a common approach in standardization issues. Central and regional authorities could show the way in this field. E-invoicing, especially in the public administration, can prove to be a next "killer application" of ICT. There is growing awareness of potentially very significant impact of e-invoicing on productivity. E-invoicing standards for public administration (JHS) are currently under development and probably soon in force. The adoption of standards should be seen as one step forward. Government should push work onward ensuring at least an ad-hoc project financing of the standardization work.

Enhance Trust and Security. The national information security strategy shows clearly that in the government and widely within the interested circles the issue of trust based on the most reliable systems is taken seriously. Efforts to identify challenges, coordinate and delegate responsibilities in that field will prove to be important. Special attention should be paid to tools for SMEs to meet the expectations regarding privacy and consumer protection. Building trust is also based on good experiences. The above-mentioned Finnish study concludes that privacy, security, authentication and consumer protection initiatives are certainly welcome, but with a lack of supporting public decisions, they are less likely to succeed.

Continue awareness-raising initiatives. In respect of all public support measures, the basic question is how to pass the message to the bulk of companies. Only a very minor share of companies are direct clients of public SME services. Thus, awareness-raising plays an important role. The focus should be on benefits to be reaped from rethinking business strategies and using ICT in developing the companies' own e-business strategies. Identification of ICT's potential, planning of business strategy and ICT strategy and respectively, adoption and development of systems during use are the key issues to be addressed.

Improve monitoring of the Information Society. It has been concluded on a number of occasions that there are shortcomings in the way that statistics present the development and impacts of ICT. ICT and productivity would call for deeper analysis, in particular associated with an assessment of intangible investment such as management information systems, business models, process development, training etc. This, of course is a joint task for the OECD and all member states. International comparison of prices and quality of services and making the corresponding information available in Finland also would contribute towards increased awareness and improved market efficiency.

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