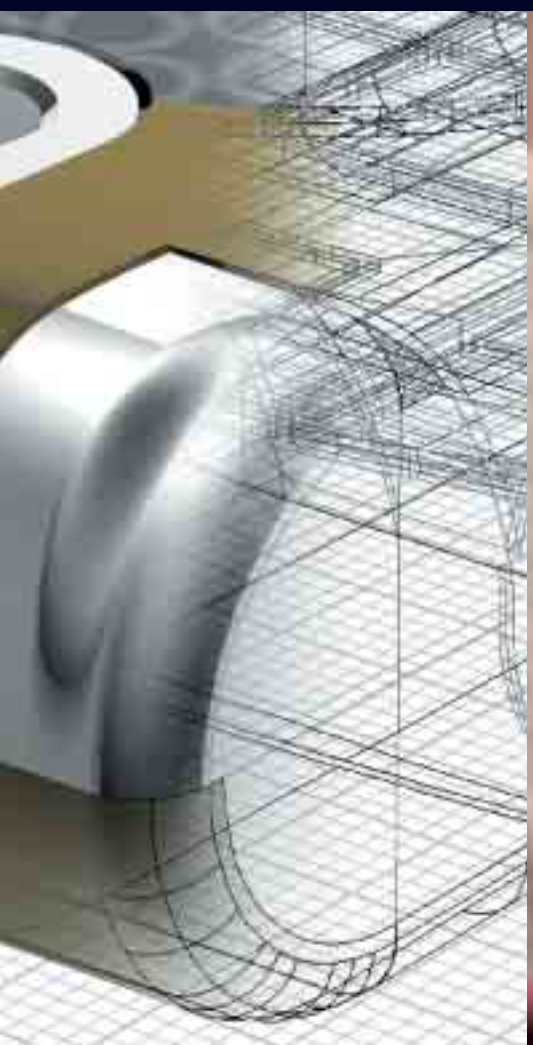
TIEKE

ven Knowledge Economy. Finland's Technology Policy Yields Fruit. |global view| Again? |international cooperation| Finland and WSIS. ICT for Development – Can esource in Global Competition |communications| Broadband Connections and nmunications| Ever Tougher Competition on All Fronts. Finnet Group – Believes l development| Information and Communications Technologies. New Business gmas of lifelong learning in engineering education. Finnish Open Source – Flying uality. Jyväskylä – Human Technology City Known for Its User Friendly Internet the Resque of SME's |investments in finland| Finland – Easy Going Markets and ng Center – an Innovative Landing to Japan. New Era of Building Management. gh-Technology – AirBuccaneers. In the Cross Roads of Development – from "ICT- bal Information Society. Report on Finland in the Global Economy: Competence, and.fi. Welcome to the Meeting Point for Information Society Developers

ICT CLUSTER FINLAND REVIEW 2005



Finnish Structures Favourable to Future Changes

During the past decade, Finland has successfully built a dynamic developing knowledge economy while maintaining the basic characteristics of the Nordic welfare model. The digitalisation has increased overall productivity in society and offered new market opportunities for digital content producers and service providers.

In order to secure continuity of development and competitiveness, Finland will need to be able to produce specialised products and services that are applicable to digital environment. A well recognized unbalance still exists between manufacturing of digital products and content production. Meanwhile, the structures – economy, education, capital and even age – of the Finnish society are favourable to the changes ahead.

Both the private and public sector will need to demonstrate innovativeness, ability to adjust to new challenges and willingness to invest. A precondition for further development is the cooperation between the two. The competitiveness of the Finnish ICT industry depends on continuous monitoring of markets and consumer behaviour and ability to change accordingly. The Information Society Programme of the current Finnish Government works as a forum where a wide range of actors from different sectors are gathered to discuss and make decisions on development of information society. The fact that the Finns have good information society skills enables the decisions to transform into actions.

TIEKE Finnish Information Society Development Centre has a vital role in building Public Private Partnership networks and initiating concrete projects to promote information society. Most recently progress has been made in developing eBusiness in Finland through our eInvoice Forum. The network promotes widespread adoption and use of electronic invoicing nationally. One local effort is described on page 39.

In ICT Cluster Finland Review 2005 we have brought together a variety of Finnish actors to present their innovative ideas, products and modes of operation, and examples of regional and state-level initiatives related to information and communication technology. By doing so, we hope to share useful information and introduce new partners for continuous building of dynamic global information society.

Aatto J. Repo
Managing Director
TIEKE

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"Wide use of ICT is everyday life. For instance, the number of Internet users is high on the international scale: 80 per cent of the Finnish population is familiar with the Internet and nearly half of these people use it every day."

Available on the Internet at www.e.finland.fi and www.tieke.fi (pdf)

4th volume

TIEKE Finnish Information Society Development Centre has a key networking role as a neutral and non-profit organisation in promoting the efforts of its members, within the public and private sectors alike, with an ultimate goal to create viable tools and expertise for use in the information society.

ICT Cluster Finland Review 2005

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ICT – Essential Tool for the Future

Leif Fagernäs, Director General | Confederation of Finnish Industries

"Indicators show that Finland is among the most advanced countries in the world with regard to education, research, and product development."

Finland has been resolutely developed into an information society over the course of several years. As the information society has advanced, changes have been experienced by production, working life, training, distribution channels, consumer habits, and everyday life. The new applications of information technology have had a major impact both socially and economically. Citizens are expected to master new equipment-skills. Companies have become users and providers of a different type of information technology.

The ICT sector is constantly growing and developing globally. E-commerce has taken a big share of the sales of products and services.

Finns can use information networks for their everyday activities in a great number of ways. Bank transactions and dealing with government departments can be handled online, as well as purchasing airplane or concert tickets. In Helsinki, tram tickets can be ordered with a mobile phone.

The Finnish government has also been actively engaged in the information society issues. The Information Society Council of Finland, chaired by Prime Minister **Matti Vanhanen**, published its first report in February 2005. In the report, the Council reviews the current information society development and ensuing challenges in Finland. It also outlines measures to address these challenges.

Indicators show that Finland is among the most advanced countries in the world with regard to education, research, and product development. Finland scores exceptionally high marks in school learning outcomes. Investments in research and product development are high in international comparison. Finland is one of the top countries in regard the use of electronic services in public administration.

Wide use of ICT is everyday life. For instance, the number of Internet users is high on the international scale: 80 per cent of the Finnish population is familiar with the Internet and nearly half of these people use it every day.

According to the report, the aim is to stay on the top of international information society development in the future as well. The goal is also to develop the information society on the basis of the Finnish model in order to make benefits of the information society available for companies and the entire population as widely as possible.

For companies, for industry, and service producers, the advanced use of ICT and the well functioning of the information society are essential tools for the future. It has been estimated that ICT accounts for 40 per cent of total productivity growth on the European Union level, but it could give a much greater contribution if it were more widely adopted. For example, in the United States of America ICT accounts to 60 per cent of total productivity growth.

It can't be enough emphasized that the use of ICT and efficient functioning of related infrastructure is at the core of making Finland, and the whole EU, a more competitive knowledge-based society.

The Lisbon strategy, as the aim of making Europe the most competitive and dynamic economy in the world placed information society issues at the top of the agenda. The strategy included drawing up an eEurope Action Plan containing several actions to be performed. ICT was identified as playing the key role in achieving the objectives. Progress has been achieved in many of these areas at both the EU and national levels, but still the work is far from complete.

Now, the Commission has undertaken a new effort and given a new start for the Lisbon strategy. It includes again significant proposals on ICT. The Commission has already started preparations for a renewed eEurope Action Plan.

We urge you all to be the engine to make these activities run and reach our goal for Europe to be a good place for its citizens and the most competitive economy in the world.

Finnish Industry Speaks With One Voice

Internationalisation and globalization have forced nations and firms into harder and harder competition. This is especially challenging for a small country like Finland. We need unparalleled knowledge, entrepreneurship, and sustainable structures for our society in order to overcome the challenge.

With these challenges in mind the Finnish business community founded the Confederation of Finnish Industries EK in the spring 2004. Finnish companies wanted to concentrate their strengths in one organization and speak with one voice at home, in the European Union, and on other international forums. Before EK the manufacturing and service industries were represented by separate organisations. EK officially began its activities on January 1, 2005.

The Confederation of Finnish Industries EK is the leading business organisation in Finland. It represents the entire private sector, both industry and services, and companies of all sizes. Its member companies stand for more than 70 percent of Finland's GDP, and over 96 per cent of the export from Finland.

EK covers 43 different branch federations with a membership of 15 000 companies in all, which employ about 900,000 employees. EK is a member of UNICE (the Union of Industrial and Employers' Confederations of Europe), BIAC in the OECD, and IOE in the ILO.

EK's task is to create a better and more competitive operating environment for companies and the business community in Finland. The mission is to improve the competitiveness of companies in Finland. EK's vision is Finland as the most competitive country in Europe and one of the most competitive countries in the world.

EK is the leading business organization in Finland. It represents the entire private sector, both industry and services, and companies of all sizes. www.ek.fi

Confederation of Finnish Industries

Finland
An ICT-Driven Knowledge Economy

Pekka Ylä-Anttila, Research Director | ETLA – The Research Institute of the Finnish Economy

The Finnish experience in the 1990s represents one of the few examples of how knowledge can become the driving force in economic growth and transformation. In a less than a decade the country became the most ICT (Information and Communication Technology) specialized economy in the world.

Structural Change of the 1990s – the Basis of the Knowledge Economy

In the beginning of the 21st century Finland has been ranked three times on the top in World Economic Forum's (WEF) competitiveness studies, as one of the most developed IT economies, and also number one in OECD's PISA (Programme for International Student Assessment) studies of youths' learning skills and educational attainment. In addition, the country was able to produce success stories like Linux Operating System and Nokia that grew into global scale during the 1990s.

In the beginning of the 1990s, Finland's prospects seemed much gloomier. The country was hit by the most severe economic downturn in any OECD country since the World War II. GDP fell by 10 % in just three years and unemployment rose from 3 to 17 %. The recovery was, however, fast and based on major industrial restructurings. The most important factor was the phenomenal growth of ICT production. But also the more traditional industries – like pulp and paper and engineering – renewed themselves by making their production processes more productive. The economy went through a between-industries and within-industry structural change. In between-industry transformation the immense growth of electronics – i.e. telecommunications equipment industry – was the key. Within-industry change was that of creative destruction – almost in all industrial sectors large part of low productivity plants were closed down.

As a consequence, by the end of the 1990s the productivity level of manufacturing was among the highest in the world, and the ICT sector played the major role in the economy. Finland went from being one of the least information and communication technology (ICT) specialized countries to becoming the single most specialized one. This is exceptional. In ICT laggards rarely catch up, let alone leapfrog, the leaders. Probably good luck and wise policies were needed.

Indeed, there were major changes in policy thinking. Today, acknowledging the underlying causes of the early 1990s recession, greater emphasis is put on longer term microeconomic as opposed to short-term macroeconomic policies – the foundations of sustained national competitiveness are largely created at micro level, i.e. in firms, financial institutions, and various innovation policy agencies.

Finnish Knowledge Economy in an International Perspective

Competitiveness indicators, like that of WEF, predict relatively poor future growth performance of economies, but they may give useful hindsight on the various factors that have contributed to the competitive edge and well-being of nations. Undoubtedly, the most important ones include strong commitment to education, high-level technological infrastructure, well-functioning public institutions, openness of the economy, and integration into the international trade blocs. But today also more importantly factors such as network readiness, research and creativity, strong social cohesion, and sustainability of environment. An important issue is also adaptability and common acceptance of change – often typical of small countries.

No doubt, high-level education system, developing information and communication infrastructure, and increasing public and private investment to R&D had their role in the industrial transformation of the country.

Education is the key, however. Educational attainment in Finland increased significantly throughout the 1990s. Enrollments in universities and other higher education rose significantly, and today younger generations are among the highest educated by any standards. The country was showing extraordinary dynamism and high social cohesion at the same time. By the beginning of the new millennium it was among the high performers by almost any economic and knowledge economy indicator.

The overall picture and comparisons across various regions and countries is given in Figure 2. It ranks Finland on the top in knowledge economy development together with other Nordic countries and North America. It also tells that there is strong persistence – at least over the medium term – in the group of most developed countries. Taking a bit longer horizon Finland stands out, however, also as an example of structural change, transformation – and actually relatively quick turnaround – as discussed above.

The background of the major structural change lies in the economic and social system that has developed over decades. Smallness, homogeneous society, and ability to seek consensus when needed, might also be important explanations for knowledge economy developments.

Small Nordic Economy and Welfare State

Finland can be appropriately characterized as a Nordic welfare state: an egalitarian country with relatively even income distribution, low class distinctions, and relatively high social cohesion.

THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY, ETLA

carries out research on economics, business and social policy as well as makes economic forecasts. ETLA's activities facilitate financial and economic policy decision making in the organizations sponsoring the Institute, Finnish companies and the entire economy.

www.etla.fi/eng

Figure 1. Finland in WEF (World Economic Forum) Competitiveness Rankings

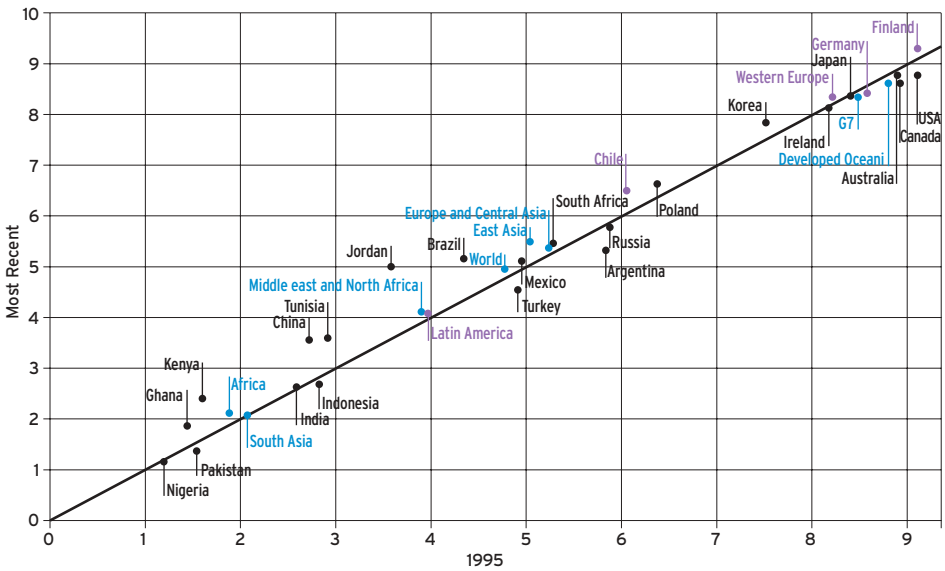

Figure 2. Global View to Knowledge Economy – Knowledge Economy Index by countries and regions, 1995 and the most recent year

Source: World Bank - Knowledge Assessment Methodology. Knowledge economy index consists of 76 structural or qualitative variables to benchmark performance of more than 120 countries (see www.worldbank.org/kam)

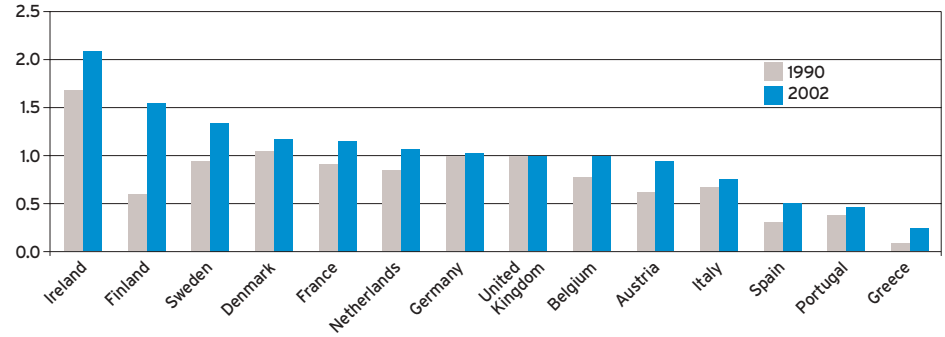

Figure 3. Exports/imports ratio of high-tech products

Smallness is both an advantage and a disadvantage. There is some evidence in the economic literature that smallness as such might retard economic growth. Small countries have less scope for utilizing scale economies in production and marketing. On the other hand, small home markets drive firms to specialize and seek foreign markets early on. Most small countries can be described as open economies with large exporting sector and high ratio of FDI to GDP. In Finland exports in relation to GDP is currently close to fifty percent.

Smallness and homogeneity of the society might also be beneficial for creation and diffusion of new knowledge in specific areas – like ICT. In the period of rapid technical change this could be a competitive advantage over larger countries.

Smallness and specialization increase a country's sensitivity to external shocks. Small economies have developed various ways to cope with the problem including not only macroeconomic policy measures but also many kinds of formal and informal networks and social security systems. As argued by e.g. Rodrik (2004), openness of the economy is often linked to social security systems designed to dampen down the risks arising from the high degree of exposure to the external environment.

The Finnish economy can be characterized as highly open, specialized, and networked. Networking and cooperation in society in general, as well as in the business sector and between industry and universities in particular, have proven to be important in developing new information and communication technologies in Finland (see Romanainen, 2001). Of course, social networks (or social capital more generally), can become too tight and finally an obstacle for social change and industrial transformation, but so far the benefits of networking and cooperation have been an

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advantage rather than a disadvantage (cf. Castells and Himanen, 2002; Rouvinen and Ylä-Anttila, 2003).

Finnish ICT Cluster – It Is Not Nokia Alone

The core of the Finnish knowledge economy is the Nokia-driven ICT cluster. The broadly understood cluster – from digital content provision and packing via network infrastructure, equipment manufacturing and operation to end-user terminals and portals – is comprised of about 6,000 firms, including 300 first-tier subcontractors of Nokia.

The GDP share of ICT -cluster has increased from 4 per cent in 1990 to more than 10 percent today. Nokia's share is a bit less than 4 percent. ICT cluster's and Nokia's role are even more important in strategic areas like R&D and globalization of business. ICT-related research accounts for more than 50 % of all industrial R&D.

Nokia's share in Finland's total exports is 20 %, i.e. as much as that of the total pulp and paper industry. Due to extensive exports of telecom equipments Finland's trade surplus of high-tech goods is among the highest in Europe. Also, there are significant spillovers from ICT sector to other industries in their international business. See figure 3.

Finland is quite dependent on Nokia, however. But at least now the Finnish economy has another major pillar alongside the traditional forest-based industries. What is more important, the economy has proven its ability to adapt and transform from a resource-based economy to a knowledge-based one. As compared to dependence on natural resources like oil or minerals, it seems plausible to argue that the knowledge accumulated in ICT sector could be more easily applied elsewhere should anything go wrong.

Obviously, small economies have always to concentrate and specialize and can not have a well-diversified portfolio of internationally competitive business activities. That, of course, includes major risks. These have to be responded by highly developed social security and flexible economic and social structures.

Challenges and Challengers

The wave of the information revolution coupled with the globalization process is posing serious challenges to both well-established knowledge-based economies as well as emerging countries who want to benefit from new technologies. Global production patterns are changing while leading producers of ICT goods and services are moving their production off-shore. China and East Asia are becoming the most important production bases for manufacturers, including ICT goods.

Recent research seems to give evidence that some Asian countries like China, South Korea, and Taiwan are specializing in their production and foreign trade to similar goods as Finland and other advanced ICT producers. That is mainly due to increasing foreign direct investment (FDI). Leading ICT multinationals have been growing their FDI in Asia and Central Eastern Europe. Consequently, some of these countries have become major players in global export market for ICT goods, and increasingly IT services too. Innovation is not a domain of advanced markets and developed countries either.

What's Next?

Although the original ICT boom was over in the turn of the new millennium, the revolution is not over. Quite the contrary. We see shifts in the global division of labor as new producers take their place in world trade and global production networks. Advanced countries are put into a harder competition and are forced to seek new ways of creating value in the global digital economy.

The focus will be in new applications and opportunities given by digital convergence. Being a leading edge ICT producer is not any more a guarantee of future success. That is a major challenge to Finland, since the country has lagged somewhat behind the frontier of the most sophisticated users of ICT and benefited from ICT revolution mainly as an advanced producer. It is evident that the productivity gains from ICT will diminish substantially unless the usage of these technologies is intensified. Production advantages are moving off-shore, more efficient use of ICT has to take the key role in fostering and upgrading knowledge economy.

There are, however, several new routes opening in ICT applications. The sector specific effects of ICT use will gain more importance. Especially, in services sector the opportunities for productivity increasing solutions and applications are numerous. Another thing is the convergence of several historically distinct technologies, like ICT, bio and nanotechnologies. The next industrial revolution might well be based on combination of Nano-, Bio-, Information, and Cognitive technologies. Maybe the next wave of fast industrial development is called NBIC revolution, as has been envisioned. In that wave Finland will be well positioned due to strong ICT sector, and rapid advances in the other three.

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Finland's Technology Policy Yields Fruit

Antti Joensuu, Deputy Director | General Technology Department Ministry of Trade and Industry

Since centuries, Finns have been known to be fast appliers of new technologies. A nation struggling with severe climate conditions simply had no other possibilities than to apply new technologies as fast as possible.

For instance, only six years after the patent of Bell major cities in Finland had telephone companies. In the beginning of the 1920's Finland had already both a national airline and a broadcasting company in operation. Later, Finland became a forerunner in the mobile phone and Internet use, as well as in international comparisons based on science and technology indicators.

The modern research and development (R&D) policy in Finland starts from the beginning of the 1980's. It became clear that Finland would never be able to compete successfully with a resource-intensive industry, whereas knowledge intensity and technology offered the platform on which to build the future. The solid shape of the competitiveness of Finland today is based on the common understanding of the importance of technology, research, and development. This national consensus was largely built already more than twenty years ago during the 1980's, both Tekes, the National Technology Agency and the Science and Technology Policy Council were founded.

The performance of the Finnish economy in the 1990s was remarkable after a severe economic crisis in the beginning of the 1990's. The keywords "information society" and "knowledge-based economy" were adopted in the Finnish policies.

Today, Finland is close to the top on many interesting ranking lists: competitiveness, environmental sustainability, technology, industry-science relations, R&D expenditures, reading literacy and mathematics readiness among the youth, engineering, and natural sciences...

"Risk taking and risk sharing is an absolute necessity, since experience shows that avoiding risks is the best way to avoid success stories as well!", says Antti Joensuu.

Science and Technology Policy Council Formulates the Strategies

The Science and Technology Policy Council of Finland, chaired by the Prime Minister, advices the government and its ministries in questions relating to science and technology. The Council is responsible for the strategic development and coordination of Finnish science and technology policy as well as of the national innovation system as a whole.

Currently as many as seven other Ministers and ten other members well versed in science and technology participate in the work. The Science and Technology Policy Council has contributed a lot in the national technology strategy and has been instrumental in forming the national consensus and a solid commitment concerning the actions to be carried out in the field of national technology policy.

Tekes – an Internationally Renown Best Practice Entity

Tekes, the National Technology Agency is the main public financing and expert organization for research and technological development in Finland. Tekes finances industrial R&D projects as well as

projects in universities and research institutes. Tekes especially promotes innovative, risk-intensive projects. Risk taking and risk sharing is an absolute necessity, since experience shows that avoiding risks is the best way to avoid success stories as well!

The primary objective of Tekes is to promote the competitiveness of Finnish industry and the service sector by assisting in the creation of world-class technology. Tekes' funds come from the state budget via the Ministry of Trade and Industry. Tekes has a budget of more than 400 million euros, a solid source of funding for 2,000 projects annually.

The Ministry of Trade and Industry is responsible for Finland's technology policy. On an operational level Tekes promotes and coordinates R&D projects and programmes, in addition to maintaining cooperation within international networks. Tekes works in collaboration with several partners within the Finnish innovation environment, including the Academy of Finland, the main basic research funding organisation in Finland, and Finpro, which provides services, support and information to help Finnish companies enter the international market.

Science Parks Combine Regional and International Activities

The science parks (or technology centres) working in the vicinity of universities promote the creation of new business in the regions. They foster the founding, growth, and internationalization of innovative hi-tech companies and act as active middlemen in collaboration with universities, companies, and local authorities. The 22 members of the Finnish Science Park Association TEKEL accommodate 1,600 enterprises and other organizations – bringing together 32,000 experts working in different fields of technology such as ICT, health care, biotechnology, environmental and food technology, materials research, and digital media. On top of these, several thousands of enterprises operating outside the premises of the science parks also work in close cooperation with the local science park influence.

The science parks execute the regional Centre of Expertise programmes. They bring together companies, universities, polytechnics, public bodies, investors, etc. as well as providers of business development services in joint R&D projects within different fields. The science parks also actively identify research break-throughs for commercialization and participate in the work of the EU Innovation Relay Centre Network for technology transfer.

Today's Challenge Is Globalization

The nationality of a product or company plays a diminishing role in the modern world. Globalization is a process in which elements needed for a process or product can be selected and combined globally. This development has already relocated a significant amount of the manufacturing industry in the world. Currently, the question is about the division of labour between the nations. The only viable strategy is to accept the phenomenon and to try to make use of the best parts of it.

The role of Finland in the global distribution of tasks is evident. We cannot compete with low salaries but we can do so in the creativity and innovation. We offer one of the best innovation environments for companies coming from all over the world. A small country can, thus, really benefit from the current globalization. Small home markets forces firms to specialize and seek foreign markets already at an early stage. Moreover, the small size of Finland is also an advantage for creation and efficient diffusion of new knowledge in, for instance, ICT.

An efficient networking is crucial in the innovation process. From this point of view Finland is an excellent environment, since the Finnish economy is known as open, specialized, and extremely networked. Some foreigners even say that Finland is not a country but merely a club! A networked society is a real asset, since innovation is an extremely complicated phenomenon needing good social capital in order to realize. It cannot easily be described as a chain (as was the normal description years ago) – rather a plate of spaghetti – complicated and difficult to manage!

An example of a proactive approach vis-à-vis the globalization is the launching of a Finnish-Chinese Innovation Centre in Shanghai this year. This innovation centre, which is called FinChi, will not only help the Finnish companies to find business and technology partners in China but also pave the way for the Chinese investments towards Finland. The pragmatic approach is to amplify the favourable effects of the inevitable globalization instead of trying to restrict the phenomenon.

New themes constantly pop up and the national innovation policy can never sleep. Investing 3,5 per cent of our GDP in research and development (3rd highest figure in the world) is good – yet not good enough alone. We have to remember that the scoreboards of 2020 are built today.

www.ktm.fi/english

Finnish ICT Development from the OECD Perspective

Pekka Lindroos, Head of Information | Computer & Communications Policy Division OECD Directorate for Science, Technology and Industry

The OECD (Organisation for Economic Co-operation and Development) brings together the 30 industrialized countries for policy analysis and peer review. Some of the most frequently referred to publications are benchmarking statistics and country rankings. Luckily for all parties concerned, those of the OECD generally agree with the key findings of broad competitiveness surveys even though the OECD bases its analysis hard statistical facts mostly on official sources. This article casts a view in Finnish ICT development in the light of two reports published in December 2004.

The OECD Science, Technology, and Industry Outlook 2004 offers a comprehensive picture of micro-economic performance of countries. Finland generally ranks high in areas such as share of R&D spending and employing scientists in enterprises, as demonstrated by the following two graphs.

The report also identifies a number of challenges for Finnish policy. Service sector productivity and innovation need more focus, although the picture is uneven. Competitive services sectors, such as business and telecom services, are high-performing whereas personal and public services demonstrate room for improvement. Again, there is a need for more detail; Finland was placed at the top in the recent PISA 2003 study that ranked learning skills of 15 year olds across the OECD countries. Other public services, such as health of government, are more difficult to measure but show generally a slow change despite investment in technology.

The IT Outlook 2004 looks closer into the ICT clusters and policies in the OECD countries. Traditionally Finland has ranked high in penetration of new technologies such as mobile phones or the Internet. Broadband penetration in the household sector will remain a challenge in sparsely populated country like Finland if compared to some front-runners, in particular in the Asian countries. But commercial use of ICT in Finland is well advanced as companies seek ways to improve productivity through technology.

Despite this wide across-the-economy investment in ICT, there is still room for development in the services sectors as, like in most countries, the ICT cluster itself has played an important role in eco-

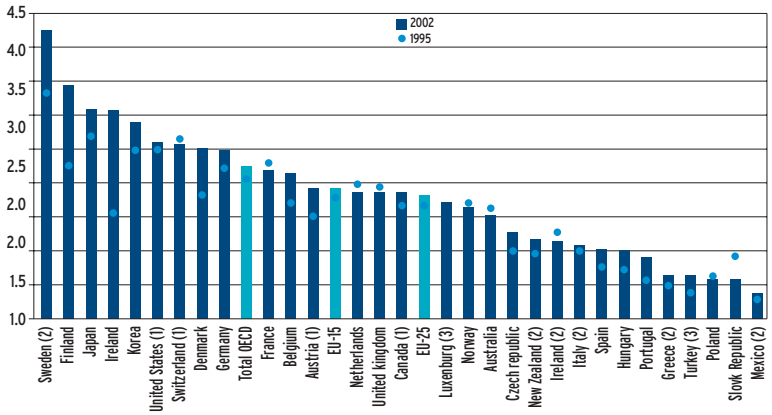


Figure 1. R&D intensity in OECD countries, 2002
GERD (Gross Domestic Expenditure on R&D) as a percentage of GDP.

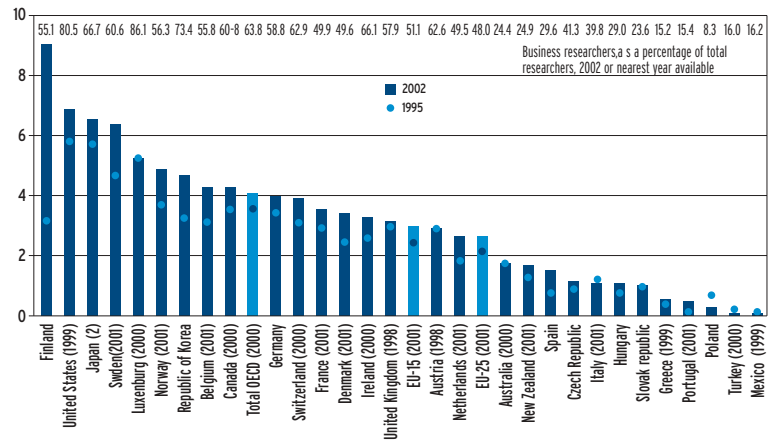


Figure 2. Business researchers per thousand employees in OECD countries, 1995 and 2002.

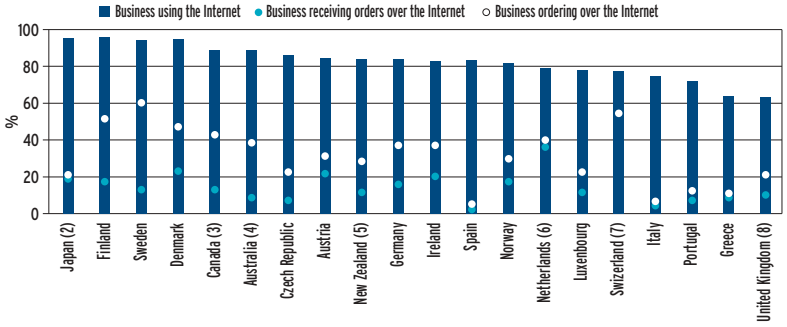


Figure 3. Businesses using the Internet for purchases and sales, 2001 or latest available year. Percentage of businesses with ten or more employees.

"One of the main challenges ahead is how to engage an increasing number of companies as users of ICT into the technology projects, and how to have more visible demonstration of impacts of technology and technology programmes."

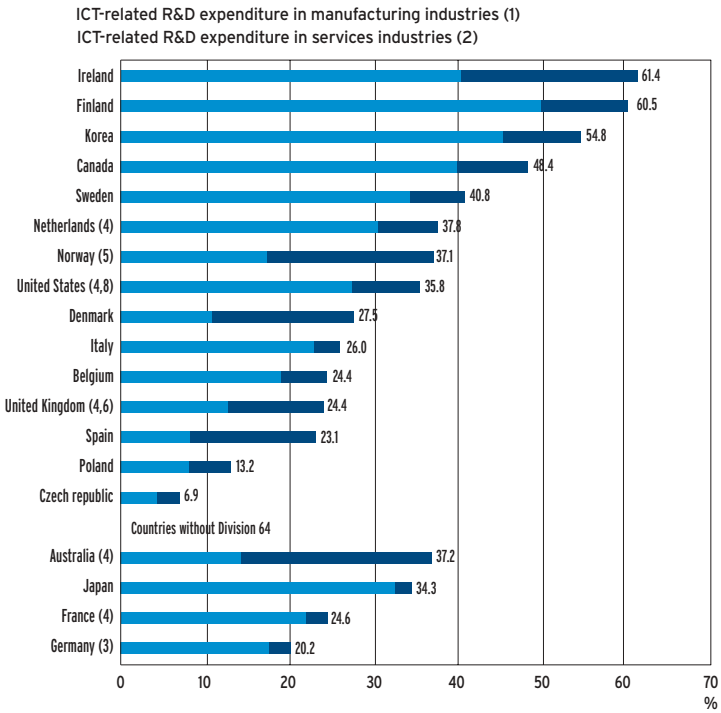


Figure 4. Business R&D expenditure in selected ICT industries, 2001 or latest available year as a percentage of business enterprise sector R&D expenditure

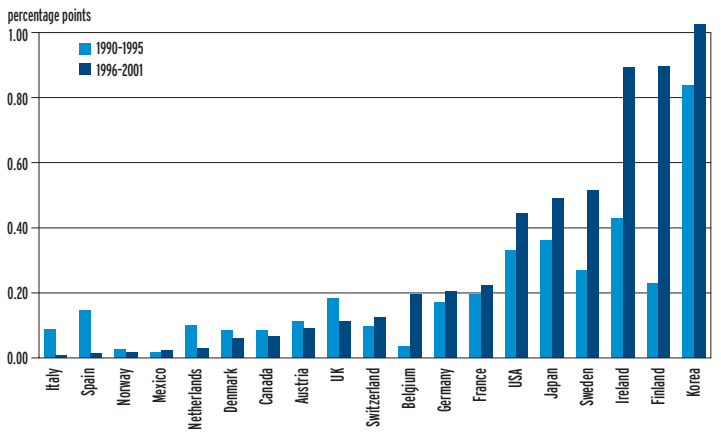


Figure 5. The contribution of ICT manufacturing to aggregate labour productivity growth
Contribution to annual average labour productivity growth, percentage points

nomic development in Finland. It has accelerated R&D investment, growth, and productivity development.

In the OECD peer reviews are used to shed light into how policy leads to performance. A recent series of reports looked into how government policies promote ICT diffusion to business. The report on Finland (OECD/DSTI 2004) highlighted the fact that market forces have been given predominance and that the government limits its interventions. One of the main challenges ahead is how to engage an increasing number of companies as users of ICT into the technology projects, and how to have more visible demonstration of impacts of technology and technology programmes.

Again, like in all countries, applying ICT in all company functions to form one single system has still a long way to go. Companies in Finland acquire production inputs over the value chain in digitally managed systems as a common practice engaging also numerous small and medium sized companies. However, integrating the different systems takes time.

The report also notes that even though the telecommunication markets have been deregulated in Finland quite some time ago, the authorities need to keep a keen eye on network access conditions for competing service providers, in particular in broadband markets.

The report concluded that the future success of the Finnish economy and the ICT cluster will depend on the ability to turn new technology innovations into practical applications that companies and people will be willing to invest in. Competition and squeezed margins may make companies to view bold business ventures and provision of new technology applications with a critical eye. But, like in the past, competition and innovation go intimately hand-in-hand. Entrepreneuring innovators will continue to enjoy of the acceptance of a technology privy market such as Finland.

www.oecd.org/sti

Why the Finns Again?

Dr. Pekka Tarjanne,
Chairman of the
International Award
Selection Committee

Some years ago Swedish newspapers liked to use headlines like "A Finn Again".

We Finns have also had for a long time a strong love-hate relationship with our dear neighbours, the Swedes. As a part of this phenomenon the Swedes wanted to prove that most crimes in Sweden were committed by Finnish immigrants or tourists.

Today we are more used to other kinds of headlines:

"Finland, the world's number one in competitivity"

"Finland, the least corrupt country globally"

"Finland tops many statistics describing efficiency in ICT and its applications"

"Finnish students rank highest in the world"

"Finland among the best when you measure Quality of Life"

Why have things changed?
Why has this poor country with very limited natural resources become a leader in so many fields?
Where can we find the Finnish secret?
Can it be used or even copied in other parts of the world?

These are the kinds of questions asked by many people from all over trying to help their own countries. Is it really true? Can we too change our lives overnight for the better? The correct answer is that that there is no one answer except that it can be done, but not overnight!

It has taken the Finns a lot of effort during the last more than 150 years.

In the middle of the 19th century a Finnish statesman and author stated that a small country can only survive successfully through its culture. (The same is, by the way, true today in our world of globalization.) Thus, in the words and deeds of Johan Vilhelm Snellman started the Finnish magic. Although, in order to tell "the full truth", he despised engineers and knew of course nothing about ICT or anything else related to modern technology that has done so much good for our nation.

Snellman wanted everybody to learn to read and write. His contemporary, Mr. Cygnaeus started the "obligatory primary school". As a matter of fact, it was the church that contributed the most important part deciding that men would not be allowed to marry unless they were literate! This was a good start and soon in the late 19th century Finland was already a world leader in the number of newspaper copies per capita.

Ever since we have done a good job in defending our culture. Since our independence in 1917 we have never been occupied, quite an achievement in the turbulent Europe! We have also a remarkable history of PPP – Public Private Partnership – creating a history of economic growth second to none in spite of lost wars and the fact that a few beautiful trees enjoying pure air and water have not yet been able to prove to the rest of the world that this is or it will be the future paradise. Global warming is going to be an interesting test!

So far our cold infamous climate has saved us from too many immigrants, but in the years to come we hope to get more, for all kinds of work, equally scientists and street sweepers. We have a strong culture, we are not afraid of any democratic peaceful globalization. We want to continue to build for the future, for a real information society, information for all. (My personal idealistic goal is literacy for women in the least developed countries, in particular in Africa).

One of the latest Finnish contributions to mankind has been the Millennium Technology Prize. Again a Public Private Partnership initiative honouring once every two years a global technological innovation for human development with one million euros. Last year the prize was given to Dr. **Tim Berners-Lee** for his wonderful world-wide-web. Next year we are looking forward to another human technological innovation and a Finnish contribution to global human well-being.

The Millennium Technology Prize




Aside from its forests, Finland's chief resource for driving the country's development in this millennium comprises the people and programmes involved in building a knowledge-based society.

Finnish industry and research organisations are major players in a number of high-tech fields. In 2002, eight Finnish high-tech organisations established the Finnish Technology Award Foundation, an independent fund which aims to encourage R&D in technologies that promote people's quality of life. The Foundation awards the world's biggest prize for technological innovation, the Millennium Technology Prize.

Worth one million euros, the Millennium Technology Prize was awarded for the first time in June 2004, to Tim Berners-Lee for inventing the World Wide Web. The next award ceremony will be in 2006 and will again be hosted by the municipalities of the Helsinki region.

A HIGH-TECH COUNTRY: www.helsinkiregion.com, www.technologyawards.org

Helsinki Region

Finland and WSIS

Timo Heino, Counsellor
Ministry for Foreign Affairs

President of the Republic, Tarja Halonen and Director General at the Finnish Ministry for Foreign Affairs, Yrjö Länsipuro attending the Summit on the Information Society in Geneva 2003.

The two-phased World Summit on the Information Society (Geneva 2003–Tunis 2005) successfully promoted the global understanding of the possibilities of building information societies all over the world. Many countries are now actively developing their information society policies and concomitant tools like e-strategies. Countries donating development aid are mainstreaming ICTs in their development policies.

Finland has actively been taking part in this long, still ongoing process, and has reached the goals set for the negotiations. The Finnish information society is internationally greatly appreciated and, thus, it is expected that Finland shares the knowledge she has about building information societies with other countries.

Finland's Prominent Presence

The Finnish 50-person delegation taking part in the first phase of the Summit of Geneva 2003 was headed by President **Tarja Halonen**. In the side-event "ICT4D" Finland was well presented, as was Nokia.

The first phase in Geneva was able to adopt a common global strategy on a broad range of difficult issues connected to building information societies, such as human rights, freedom of speech, and ethical questions. Furthermore, agreement was achieved on the need to create an enabling environment with supportive and predictable policy and a regulatory framework, which encourages human participation and innovation.

Finland was deeply engaged in these negotiations and our main ideas were well received, at first within the European Union and thereafter by other UN countries.

International negotiations like these are often tedious work for the participants. Information society policies have now been on the UN agenda for three years, and it is interesting to note that we have moved from the suspicions harboured at the early stage to a far reaching consensus on how to best benefit from the information and communication technologies to boost the development and well-being of all people.

Wide Acceptance Based on Concrete Results

The principles adopted in Geneva are now widely accepted as a basis for implementing future work. This acceptance is also strongly based on the concrete results achieved in many countries that have taken action along the WSIS-principles. Also, most of the suspicions entertained by many are now beginning to be dispelled and are gradually disappearing as the positive impact of ICTs in many areas of society is becoming better visible.

This Summit is unique as it is held in two phases within two years. This means that we now have the opportunity to move forward together towards the targets we have set ourselves. In Tunis, we aim to move from principled theory to action. Now is the time to agree on the implementation on the Geneva principles in Africa, Asia, and Latin America as well as in other continents together with governments, the civil society, and the private sector. Also, an argreement on the outstanding issues from Geneva, ie. Internet governance and financial mechanisms, will be important in Tunis.

Just like Geneva, Tunis will not only be a political summit but also a meeting place of utmost importance for all information society activists from all over the world. At the side-event "ICT4D", Finland will be presenting her experiences in building information societies and best practices and solutions which might be of interest to others, especially developing countries.

WSIS, while recommending representation from governments at the highest level also invites participation of all relevant UN bodies and other international organizations, non-governmental organizations, private sector, civil society, and media to establish a truly multi-stakeholder process.

www.itu.int/wsis/

ICT for Development

Can Other Countries Learn from the Finnish Experience?

Helena Tapper, Senior Adviser | TIEKE Finnish Information Society Development Centre

ICT for Development has been the focus of action in international organizations and international fora during the last couple of years. As the information society or information economy is the current phase in many of the late industrial societies, the question is what will happen in the developing and newly industrialized economies. Will they follow the development of industrialized world or will they take a development path of their own in the use of ICT?

Economic and Social Wealth Through ICT

International development organizations, like the World Bank, Regional Development Banks, the EU, the UN, and the G8 have for some years focused on information society as a phase of future development of countries in Asia, Africa, and Latin America. The developing and newly industrialized economies can learn from the experience of industrialized countries. These countries can leapfrog the technological development and benefit from earlier experiences and use the best practices. Due to the latest technology, these countries can take a new position in the international economy through globalisation of information and financial flows. At the same time the economic growth in many developing countries allows for wider use of ICT services.

ICT as a Part of Development Strategy

Some developing countries have already produced and implemented their ICT for Development Strategy. ICT4D strategy is a national policy that focuses on ICT as a means to reach development goals of a nation. To implement the strategy an action plan with some general conditions is needed.

Telecommunications infrastructure needs to be sufficiently developed, the regulatory framework should allow for competitive services at a reasonable rate, and citizens should have access to information and communications services.

Finland has recently included ICT in its development aid program and is about to formalise its ICT for Development Strategy in this program. What could other countries learn from Finland in designing and implementing of their information society or ICT strategy?

The Finnish Experience

Finland was suffering from deep economic crisis in the early 1990's. At that time some critical decisions were made by the public and private sector. The government included information society in its program as one of the key future growth areas, public investment in R & D was increased, as well as allocation of public resources in technology education and training. This coincided with Nokia transforming into an ICT industry company from a traditional pulp and paper, tire and cable industry company.

Competitive Environment and Human Resources

The telecommunications and ICT regulatory liberalisation started in the late 1980's and early 1990's with data communications, local and long-distance telephony liberalisation and later privatisation. This created a competitive environment in telecommunications as one of the European forerunners. Finland had historically non-monopolistic telecommunications markets in local fixed-line telephony since the beginning of telephony. Finland became one of the leading information societies in the world in a little more than a decade in terms of the ICT share of GNP growth and share of exports. This development required enabling regulatory environment and human resources (trained labour), and public and private investments in R & D. According to

"The ICT for Development will provide new challenges and opportunities for Finnish information society know how."

Helena Tapper
Senior Adviser, TIEKE

Michael E. Porter, two additional elements to successful strategy are necessary: timing and luck. This was the case in Finland.

Finland had collaborated with other Nordic countries in developing GSM (earlier NMT) standard and it supported GSM to become one of the global standards in mobile wireless telephony.

The Finnish Know-How

The Finnish information society has produced innovations and best practices in ICT. We have expertise in open source software, e-learning, e-business and in digital public sector services, and high use of ICT. We also piloted early on telecenters as access points to citizens to information services. It would be useful to integrate this knowledge and experience in the traditional development areas like education, rural development, equality, and environment. The ICT for Development will provide new challenges and opportunities for Finnish information society know how. We cannot export our experience as it is, but it may provide a useful case for countries integrating ICT in their development.

TIEKE Finnish Information Society Development Centre has a key networking role as a neutral and non-profit organisation in promoting the information society.
www.tieke.fi

Know-How
The Best Resource in Global Competition

Leo Laaksonen, Adviser | Technology Industries of Finland

Five years have passed since European leaders committed themselves to the Lisbon strategy with the goal of making the EU the most dynamic and competitive knowledge-based economy in the world.

However, the competitiveness of the EU has dwindled. Investments in manufacturing industries have been moving outside the EU with an accelerating speed and the product development is next in line. The worst scenarios suggest an irreversible economic decline for Europe.

The recent Wim Kok report states: "The Lisbon strategy is even more urgent today as the growth gap with North America and Asia has widened, while Europe must meet the combined challenges of low population growth and ageing".

Together with ORGALIME and EICTA, the European cooperation organisations of the engineering and ICT industries, the Technology Industries of Finland welcomes the renewed priority given to the Lisbon process and actions supporting European entrepreneurship and innovation. We have to consider the success factors and main obstacles for entrepreneurs, especially for the innovative and growing SMEs, the most vital resource of the European society.

R&D Activity Absolutely Necessary in the Engineering and ICT Industries

The European industry must increase its productivity and renew its products. The citizens of the Union must be encouraged to innovate and take risks in starting globally competitive new ventures. All Member States of the EU ought to achieve the target of 3% of GDP devoted to R&D.

It is necessary to support research in selected areas in order to update the know-how on global leading edge technologies. It is important to improve the access of SMEs to research results and underpin them in their shorter term product development. International studies recognize the SMEs as the most reliable providers of new employment and steadily improving regional well-being.

The industrial competitiveness and innovation abilities can be ensured by industry-driven European research. Therefore, considerable investment in R&D of manufacturing technologies has to be included in future European programmes to keep the manufacturing industry in Europe. Relevant development themes of the manufacturing enabling technologies are e.g. ability to process new materials and complex products, reliability, sustainability, and miniaturisation.

Moreover, companies will only invest in innovation and R&D if there is appropriate protection of the intellectual property rights. The pending proposal on the patenting of computer-implemented inventions should urgently be adopted.

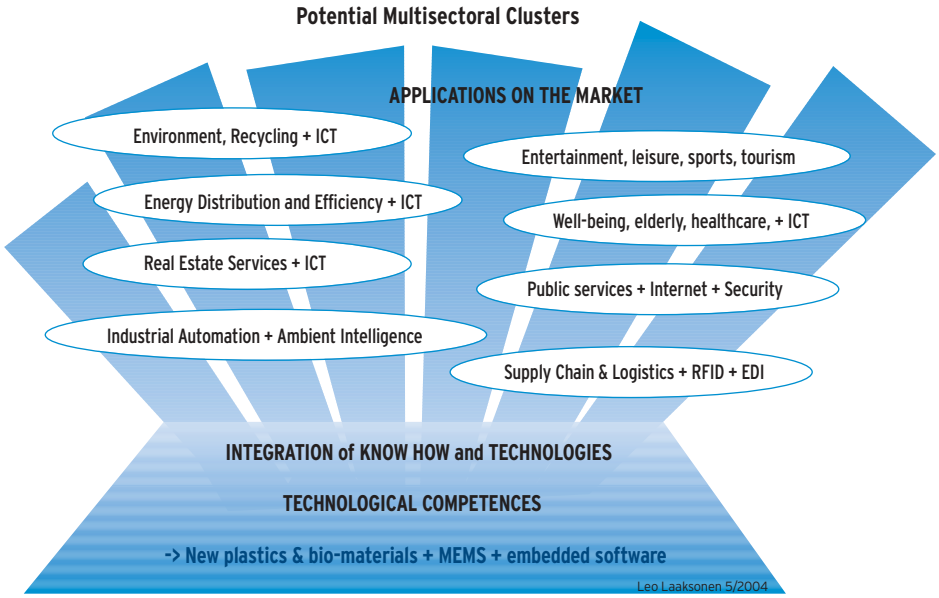
Deregulation Instead of Overwhelming EU Regulation

The EU directives were initially meant to facilitate free movement of goods and services on the internal market. Today, the massive regulative activity is out of control. In too many cases, the directives and subsequent legislation are excessively complex and they unnecessarily burden the European companies in comparison to companies outside the EU.

Europe needs to be competitive in attracting domestic and foreign risk capital. Access to risk capital, innovative environments, encouragement and reward for entrepreneurial activities will all help start-up companies. Governments should also remove obstacles for industry to invest in ICT. New and potentially disruptive technologies create the potential of new businesses and innovation that must not be stifled by restrictions.

Experience from Finland

Finland has the experience of a success story of the electrotechnical and ICT industries in the 1990s. The national infrastructure of R&D was tuned to optimal efficiency in cooperation with the companies. The most recent vision paper published by the Finnish Electrical and Electronics Industry SET



(now the Technology Industries of Finland) indicates in its road maps positive scenarios for further innovation in several segments of applications.

A key strategic factor is specialisation – sharp focus in companies' core technologies and niche applications – keeping in mind the demand of fast time-to-market and time-to-profit. Networks of different sectors of industry and services will form good platforms for system level innovations and multi-technology combinations.

The Unquestionable Benefits of ICT Use

The ICT industries are the key to the competitiveness of the entire EU. The ICT industry is typically an integrator of several areas of technologies. It is an enabler and supplier of added value to all other industrial sectors as well as the public sector.

ICT helps companies to increase productivity and create attractive products to be sold on the world market. It improves the quality and decreases lead-times and costs. ICT technologies also fuel sustainable development by reducing the environmental impact of business activities. ICT has wide application in public services: in administration, in the educational system, in the health care sector, and in transportation.

Promotion of Broadband and Its Applications

Europe's economic success depends on the take-up of world class ICT based technology. Advanced broadband will be the infrastructure of the knowledge economy in the 21st century. The European governments have not yet sufficient political vision and leadership to drive broadband take-up. European Council is urged to establish a sound political objective of "broadband for all" by 2010.

The European public sector should accelerate its investment and use of broadband ICT to improve its efficiency and the quality of services to citizens and businesses. Member States should take immediate action in eGovernment, eHealth, eLearning, and eTransport.

Having sufficient IT-user skills will be one of the key competencies in the society. Curricula must integrate IT skills at an early age. Higher levels of skills are also needed to increase the use of ICT in industry and commerce.

The security in the community is on top of the political list. The development based on ICT technologies is, hence, fundamental for the overall security of citizens. Problems in security already impose an enormous cost on industry and undermine consumer confidence in new services.

The digital content and services ought to be easily accessible to European consumers as well as professional users. Maximum interoperability of IT systems, applications, and networks is one of the most important requirements of the future information society. Three key factors should be addressed and managed carefully:

- Data protection to obtain consumers confidence and a trust
- Digital Rights Management system, for appropriate revenue to all players
- Efficient and reliable payment mechanisms

Leo Laaksonen serves as Adviser at Technology Industries of Finland, organization with a mandate to help its member companies maintain their competitiveness in international markets.
www.teknologiateollisuus.fi/english

"The Government supports innovation networks with investments to infrastructure, education, research and development – and with liberal market regulation and lean bureaucracy."

Leena Luhtanen
Minister of Transport and Communications
Vice-Chairperson of the National
Information Society Council

Broadband Connections and Information Security

Leena Luhtanen, Minister of Transport and Communications | Ministry of Transport and Communications

The global market offers borderless business opportunities. But the same opportunities are open to everyone else as well. The key factor to success is productivity – how to produce more added value with the available resources. One of the best ways to do this is to use new technologies and to build dynamic networks with partners and customers. In Finland the forerunners can be found from the ICT, banking, paper, and metal industries.

The Government supports innovation networks with investments to infrastructure, education, research and development – and with liberal market regulation and lean bureaucracy. A forum for these activities is the Government Information Society Programme – with ambitious goals to improve competitiveness and productivity, to promote social and regional equality, and to improve citizens' well-being and quality of life through efficient use of information and communications technologies. The Programme is chaired by the Prime Minister and involves key stakeholders through the Information Society Council.

Two cornerstones of the programme are the Broadband Strategy and the Information Security Strategy.

The Broadband Strategy pools key actors together to make sure that by the end of 2005:

- **All technologies included, there are 1,000,000 broadband subscriptions in Finland, of which the most have a connection speed of at least 2 Mbit/s (in a population of 5.1 million inhabitants)**
- **High-speed telecommunications connections with regional coverage and reasonable end-user prices are available to everyone; and**
- **Finland's status as one of the European leaders in the use and availability of telecommunications connections is stabilized.**

The strategy contains nearly 60 concrete actions that will make these objectives real. These range from legislative measures increasing competition to research and development actions creating new services.

The Information Security Strategy is the Government's main tool to build trust towards the information society. The main objectives of the strategy are to:

- **Promote national and international cooperation in the field of information security;**
- **Increase national competitiveness and build a favourable business environment for ICT firms;**
- **Improve information security risk management;**
- **Safeguard the citizens' fundamental rights and help companies to protect their knowledge capital; and**
- **Increase awareness of and competences in information security.**

The strategy contains about 30 measures and brings resources of the Government, business sector, and other organisations together. The strategy underlines the importance of information security and trust in the development of new products and services and in their adoption by the customers. It also points out that information security is not only a technical issues but more and more an economic, social, and political challenge.

Broadband connections and information security are crucial elements of the information society. However, there are other crucial elements as well. Efficient use of new technologies requires new skills, new working methods, and new ways to organize the entire company or administration. The Information Society Programme emphasizes strongly education, training, and organizational development both in private and public sectors. Competition is pushing companies to innovate and change, yet the need for radical reforms concerns the public sector as well. Cost effective, service oriented, and cooperative administration is a strong factor when trying to attract work and investments. And this is exactly what we are doing within the Information Society Programme as well: structural and operational changes at the central and local levels that will let us utilize fully the opportunities of the ICT.

www.mintc.fi/english

Enforcing the Security of Information

Sari Salmela, Project Coordinator and Jani Arnell, Information Security Adviser | Finnish Communications Regulatory Authority

The National Information Security Day in Finland

The National information security day is a joint project of the business life, public administration, and various organisations. The Information security day aims at increasing the Finns' awareness of the risks of the Internet and provides information and advice on how to protect oneself against information security threats.

Further information
www.tietoturvaopas.fi (in Finnish)
www.tietoturvakoulu.fi (in Finnish and in Swedish)

The National information security day in Finland is a common project of the business life, public administrations and various organisations. The Information security day aims at increasing the Finns' awareness of the risks of the Internet and provides information and advice on how to protect oneself against information security threats.

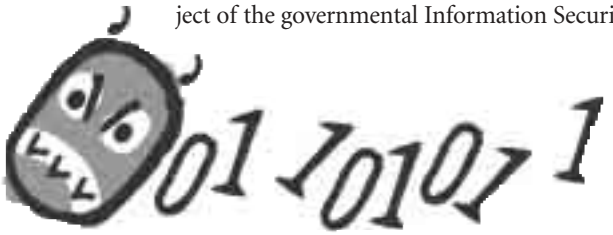
The first National information security day was held in Finland on 11 February 2004. The objective of the day was to ensure that operating system updates, up-to-date anti-virus software and a firewall are incorporated into all Internet-connected computers. The day was a success: according to studies commissioned by Taloustutkimus, a market research firm, and Statistics Finland, a significantly increasing number of home computers, in comparison to last fall, had both antivirus software and a firewall.

Primary Target Group in 2005 Pupils, Teachers, and Parents

The Information security day of 2005 was held on 8 February 2005. The day was targeted at schoolchildren, their teachers and parents. The aim was that the day would engage schools in a yearlong work project regarding information security. This would involve that emphasis is put on the safe use of the Internet and that students take the valuable information to homes as well.

To support the information security education given at schools, an online service, www.tietoturvakoulu.fi (information security school), was opened on the Internet. The three key messages of the website are: Protect your computer, Safeguard yourself and Follow the rules. The service encompasses sections for teachers, younger and older schoolchildren and parents. In the pupils' section, animated stories designed for different age groups include information security knowledge, suggest themes for further discussions, and provide a lot of exercises.

The National information security day is the primary project of the governmental Information Security Committee.



in Finland

The aim of the National Information Security Strategy is to create an up-to-date and functional overview of information security that serves all target groups.

Together towards an Information-Secure Society

The functions of FICORA's CERT-FI team (Computer Emergency Response Team) include dealing with information security threats and incidents in cooperation with both trade and industry as well as various authorities. Also, the CERT-FI team creates an up-to-date and functional overview of information security that serves all target groups.

The Finnish Communications Regulatory Authority (FICORA) is a Finnish information security authority whose responsibility is to enforce information security policies in telecommunications companies, protect privacy in electronic communications, and prevent and resolve information security breaches. Belonging to FICORA's information security unit, the CERT-FI team is Finland's national CERT actor. Its customers comprise all essential Finnish companies and other organisations as well as private persons.

Information security breaches and attempts to cause them are continuously increasing. In order that Internet users could avoid these risks, they must be aware of the threats of the net world. FICORA's CERT-FI team participates in a project under the National Information Security Strategy, whose aim is to create an up-to-date and functional overview of information security that serves all target groups. This situation report is updated by FICORA and all key actors have access to it.

FICORA's CERT-FI delivers information on information security by issuing alerts and guidelines e.g. at www.cert.fi, via e-mail lists, and on the teletext of the Finnish Broadcasting Company. CERT-FI publishes quarterly and annual reports, which can be found on the website www.ficora.fi (in Finnish). The situation report examines factors, which have influenced the information security situation over the past quarter. These are malicious software and their effects in Finland, phenomena related to spam, the amount of problematic information systems, as well as the development of data system break-ins and vulnerabilities. The report also analyses the information security outlook of the following quarter. The situation report aims to support companies and organisations as well as private actors in their attempt to increase the management of information security risks.

In early 2005, CERT-FI published an annual review according to which information security problems in Finland during 2004 were caused by e.g. various malicious software epidemics, worms in particular and malicious software called BOT, which caused significant problems for several Finnish companies and and organisations. Professional pursuit of economic benefit, in particular, contributed to the development of malicious software. The information security of mobile devices was affected by e.g. the first malicious software that hit mobile phones running the Symbian operating system, as well as programs exploiting program vulnerabilities in Bluetooth connections.

A country of high technology, Finland considers it important that the level of information security is high. In broad cooperation with various actors in the sector, FICORA aims to promote information security and privacy protection in communications networks and services.

Contact details for the CERT-FI team:
www.cert.fi
cert@ficora.fi

The Information security day 2005 was arranged by:

Elisa Corporation
Finnet Association
F-Secure Corporation
Hewlett-Packard Oy
Helsinki Televisio Oy
Ministry of Transport and Communications
The Mannerheim League for Child Welfare
Microsoft Oy
Nokia Oyj
Nordea Bank Finland Plc.
National Board of Education
Ministry of Education
Save the Children Finland
Song Networks Oy
Association of Finnish Local and Regional Authorities
TeliaSonera Finland Oyj
TIEKE Finnish Information Society Development Centre
Finnish Federation for Telecommunications and Teleinformatics FiCom ry
Office of the Data Protection Ombudsman
Finnish Information Security Association
Information Society Programme Finland
Finnish Communications Regulatory Authority

Ever Tougher Competition on All Fronts

Reijo Svento, Managing Director | Finnish Federation for Communications and Teleinformatics, FiCom

The ICT sector continues to face a period of transition and changes. Competition in the communications and information technology sector is getting tougher, and there have also been signs of restructuring. In the mobile phone and broadband sector there are even signs of overheating, and the prices of terminal equipment and services have fallen.

Competition has also been promoted by means of legislation. One of the surprisingly popular phenomena during the last year was the portability of mobile phone numbers, which means that customers are able to keep their old numbers even if they switch operators. There are about 4.5 million subscriptions in the Finnish mobile phone market, and about 1.5 million of them have been switched to another operator. There are even consumers who have transferred their numbers several times in search of even better offers.

The legislation and above all its interpretation have become stricter. Finland has introduced EU-level regulations early and in a very extensive manner.

Although Finland has been in the vanguard of many new innovations, third generation mobile communication services were introduced here somewhat later than in many other countries. This is due to, e.g. the lack of terminal equipment that would meet consumer requirements and the fact that it has been possible to implement services of the 3G network with more advanced technologies that are already in use, although this has been a slower and more complicated alternative. Wireless local-area networks (WLAN) are also spreading to offices and homes.

Larger companies and public administration are rapidly starting to exploit the opportunities offered by VoIP (Voice over Internet Protocol) as an efficient means of implementing voice communications.

"It is true that Finland is not number one in the world in all respects but, as a whole, Finland can still be said to be one of the top countries in the world."

Reijo Svento, Managing Director, FiCom

Rapid Changes

One of the major trends lately has been the extremely rapid increase in the number of broadband connections. As the estimated number of broadband connections was 470,000 in December 2003, there were already 750,000 connections in December 2004. This means that every third household in Finland has one.

In early 2004, the Government of Finland adopted a National Broadband Strategy. It is now evident that we will reach its target, one million connections by the end of 2005. Finland has been able to increase access to broadband subscriptions considerably. Today more than 95 per cent of the population has access to a connection.

The emphasis of the Broadband Strategy has been transferred from quantitative to qualitative targets. The aim is to increase the speed of most connections to at least 2 Mbit/s by the end of 2005. By the end of 2007, the most common subscription type should be 8 Mbit/s. Before these targets can be reached, both the commercial and the public sector must develop services and contents that consumers regard as useful.

The sales of digital set-top boxes and integrated digital televisions also increased rapidly in 2004. At the beginning of 2005, every fourth household in Finland has access to digital television transmissions.

Smaller and More Efficient Equipment

The so-called Moore's Law still holds true for the development of information and communications equipment: the power of the equipment increases as its size diminishes. Small lap-top computers now have as much memory and other features as the most advanced desk-top computers some years ago. Today's mobile phones are small wonders with their cameras, e-mail, calendar and memo functions, MP3 players, and several other features.

The size of the files to be transferred has increased incredibly. This is mainly due to the fact that more and more video and audio is transferred through the Internet. The volume of the Internet traffic between Finland and other countries has increased threefold in just one year: it has increased from two gigabits per second to six giga-

FICOM, FINNISH FEDERATION FOR COMMUNICATIONS AND TELEINFORMATICS

FiCom is an industrial co-operation and lobbying organisation in the field of industrial policy concerning the Finnish telecommunications and message transfer sectors.

FiCom represents the industry in their relations with political decision-makers, authorities, and the media, both nationally and at EU level. FiCom also monitors and gathers information on the sector and analyses it in an extensive manner.

FiCom's members are companies and other entities that operate in the ICT sector in Finland. The total turnover from Finland of FiCom's members is about EUR 6.7 billion. Approximately 43,000 people work in their different locations.

Additional information: www.ficom.fi

bits. This is the highest growth figure in the whole of Europe. If this trend continues, it will require more rapid data communications connections and, e.g. the increasing use of fibre technology.

The infrastructure in Finland is at least at the same level as in most of its competitors. Therefore, the emphasis has already shifted to more extensive and versatile exploitation of the existing infrastructure. Companies are adjusting their old work processes so that they will take greater advantage of information technology, and new services and more versatile contents are created to the existing information channels.

Finland Still at the Vanguard

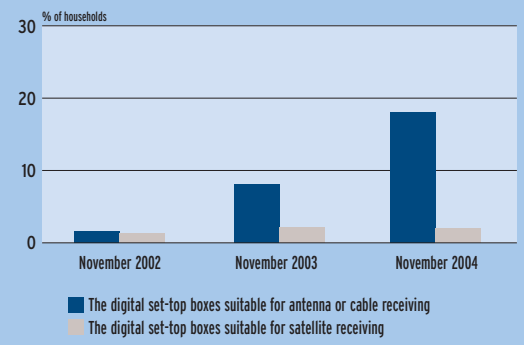
It has been said that Finland has lost its position in the vanguard of information society development. This is, however, a too black-and-white manner of looking at the issue. It is true that Finland is not number one in the world in all respects but, as a whole, Finland can still be said to be one of the top countries in the world.

The steps that we have taken lately have improved our position in many sectors. Finland has also manifested its wish to maintain its position as one of the leading information societies in the world by compiling an extensive Information Society Programme headed by the Prime Minister. The programme also has a very central place in the present government's policy. Several hundreds of experts from all fields of society, both public administration and companies and other organisations participate in the implementation of the programme.

Despite the tough competition – or perhaps partly as a result of it – Finland continues to be in the vanguard of development. A country worth investing in and an excellent place to look for partners.

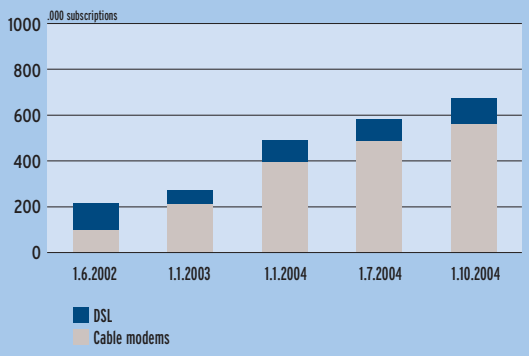
Statistics on the sector 2004 complied by FiCom

Digital TV Households in Finland



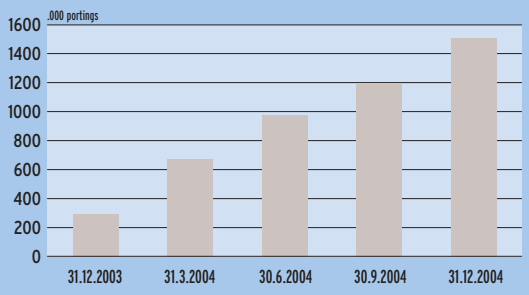
The number of digital televisions and set-top boxes in households is still modest, but the rate of growth is rapid. In the autumn of 2004, the digital television network covered about 94 per cent of the population (Statistics Finland and Finnpanel).

Access to Broadband Internet Services in Finland



In November 2004, 30 per cent of households had a broadband connection. In November 2003, the corresponding figure was 20 per cent (Statistics Finland and Finnish Communications Regulatory Authority). As compared with a modem connection, a broadband connection more than doubles the use of the Internet. It also increases web trade and the use of other digital services (TNS Gallup).

Number Portability in Mobile Communications Network in Finland



The portability of mobile phone numbers was introduced in Finland on 25 July 2003, as the new Communications Market Act entered into force. The act made it possible to keep the old number even after switching operators. At the end of December 2004, altogether about 1.5 million numbers had been transferred to another operator (Numpac).

Finnet Group Believes in the Power of Locality

Press and PR | Finnet

Once upon a time in Finland, around the year 1935... there were 815 privately owned local telephone companies in just about every village all over the country. At that time most other European telecoms were state-controlled. In Finland the state-owned telephone companies co-existed with privately owned local telephone companies. It is fascinating to realize that some traces of this unique historical background of Finland's telecommunications setup can still be seen in today's market.

Finnet Group is a descendant of these traditionally privately owned local telephone companies. Therefore, it is a natural strategy for Finnet to concentrate on local business rather than to start to compete with the giants of the industry. Finnet's market share from Finland's telecommunications services total market is about 20 per cent.

Modern Technology Combined with Quality Service

Seppo Toivonen, Managing Director of the Finnet Association, is well aware of the recent development and the challenges of media convergence, for example. Acquisitions and mergers have created a completely new type of industry structure in the past couple of years. In addition, globalization and demographic developments raise the stakes and toughen the surviving players. Small local players have been warned about all different kinds of threats. However, according to Toivonen, there is another point of view to be taken into consideration.

"As far as I am concerned, the customers will always be reached locally. No matter how much there is talk about globalization and multinational mega-mergers there will always be a need for local and more specialized customer relationships.

Photo Magnus Löfving

"Co-operation and positive attitude are two key factors that will lead us for the right path."

Seppo Toivonen
Managing Director of the Finnet Association

Most of our customers appreciate the fact that there is a local operator in their area. People like the idea about their own local telephone company. In fact, it is the very foundation of Finnet to operate in this way. Small scale local telecommunication firms can offer their customers the kind of high-quality services that some larger corporations are unable to deliver", says Seppo Toivonen.

Local Sensitivity as Strength

As the forces of globalization create ever larger corporate entities on the one hand, the forces of segmentation require more and more customization on the other. "Local sensitivity is our main weapon against our competitors. Finnet operates also nationally but our focus will be on the first class customer service at the local level. All Finnet's local telephone companies enjoy trust in their local area. Our clients are familiar with their local telephone operators in the surrounding areas, and people seem to understand that they actually support their own local well-being by investing their money to local players instead of others", says Toivonen.

"What will be the role of a telephone company in the year 2010? It is definitely easier to ask than to answer. We cannot foresee the future but there are some principles that we must keep in our minds. As a relatively small player, we must rely on our strengths. We have been doing this business for over 100 years. Finnet has very strong operator know-how. Our infrastructure and penetration rates are extremely good. We have a lot of potential, and now we must keep on believing in our strategy. Co-operation and positive attitude are two key factors that will lead us for the right path", concludes Seppo Toivonen.

FINNET GROUP

Finnet is a Finnish telecommunications group, which offers all its clients local and national voice, data, and digital television services. Finnet Group consists among others of 35 telephone companies, Finnet Ltd and Finnet Association. The group's turnover in 2003 was 978 million euros.

FINNET'S TELEPHONE COMPANIES

There are currently 35 telephone companies that belong to Finnet Group. These companies are situated in different cities all over the country. The first telephone companies that belong to Finnet Group were founded already 120 years ago, only six years after the telephone was invented. Local presence and close contact with clients are the strengths of Finnet's telephone companies.

FINNET ASSOCIATION

Finnet Association is an industrial interest group and co-operation forum formed by local telephone companies and other corporations. Finnet Association guarantees that its member companies have access to specialised, effective internal services. The association is also consulted as an expert in matters of regulations and stipulations in telecommunications.

FINNET FOCUS LTD

Finnet Focus Ltd's line of business includes training, communications, and information services.

FINNET LTD

Finnet Ltd consists of Finnet's nationally operating companies. The managing director of Finnet Ltd is Matti Makkonen. The subsidiary companies of the Finnet Ltd include: DNA Finland Ltd, Finnet Networks Ltd, Finnet Logistics Ltd, and Suomen 3KTV Ltd.

DNA Finland Ltd is Finnet's national mobile operator, which offers personal and customised wireless solutions to consumers and companies. DNA's services use the latest network technology. More information www.dnafinland.fi.

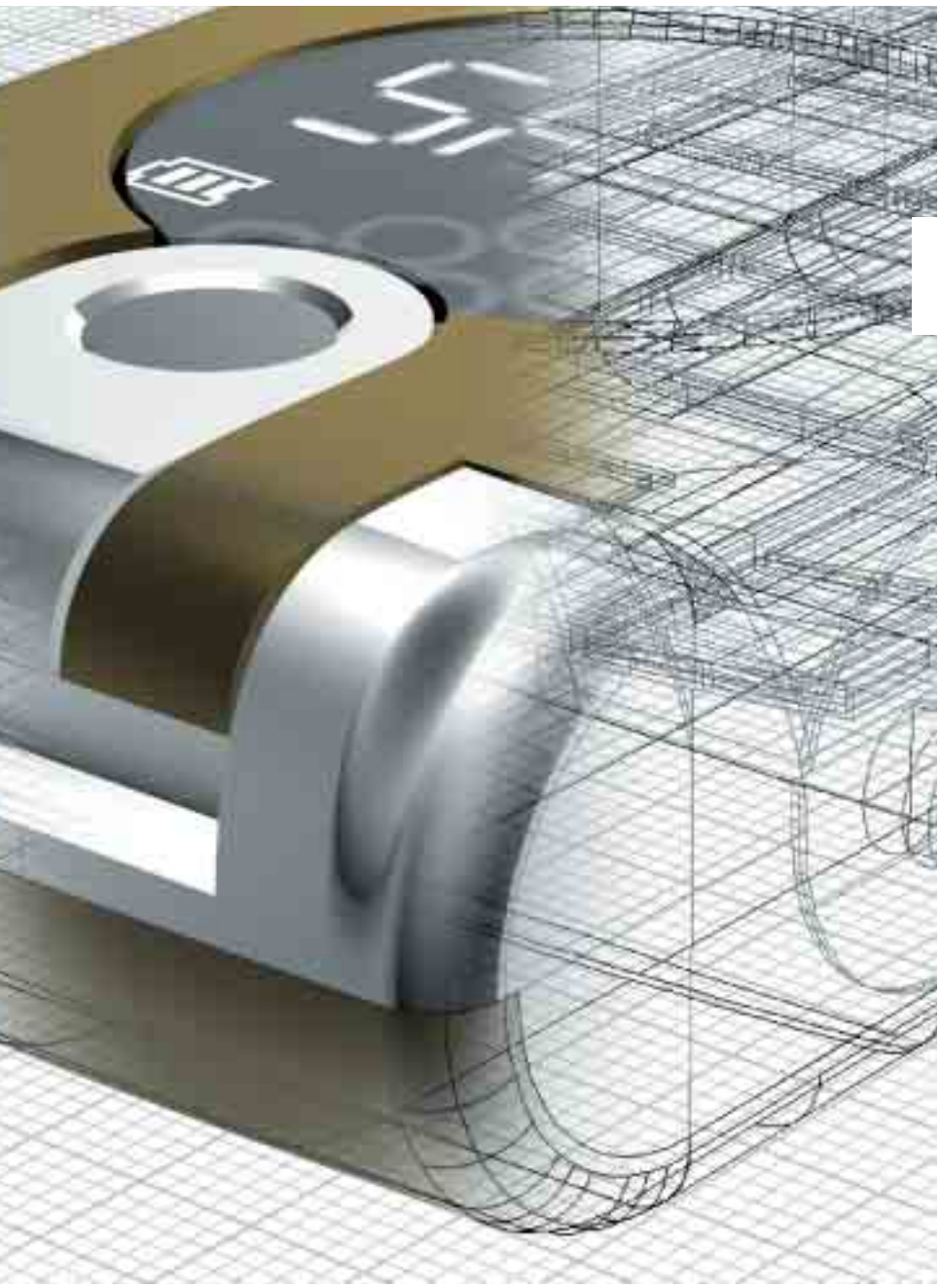
Finnet Networks is the GSM/GPRS operator of Finnet that carries calls, messages, and services. It is also responsible for the planning, constructing, usage, maintenance, and marketing of the network.

Finnet Logistics Ltd is a national negotiation organisation which coordinates the acquisition operations of goods and services of its owner companies both from Finland and abroad.

Suomen 3KTV Ltd is the country's biggest cable television distribution network. It produces digital television services for local telephone companies or cable television companies owned either totally or partially by them. Suomen 3KTV Ltd's companies now offer 46 digital TV-channels and 24 radio channels. The services are available to about 280,000 households through the distribution network.

www.finnet-liitto.fi/eng

Elcoteq – Establishing a Global Footprint



Communications technology products are part of the daily life for people around the world.

Elcoteq Network Corporation is expanding globally to ensure that these products are available, designed and manufactured with the highest quality standards for the best possible value.

Products such as mobile phones, set-top boxes and the base stations, and supporting infrastructure are supplied by a multitude of companies. Many of those companies rely on Elcoteq as their outsourcing partner to help produce the products.

Specialization as Competition Approach

Although many large EMS companies choose to diversify into many markets and product offerings as a growth strategy, Elcoteq has chosen the opposite approach, specialization. Specialization promotes competency, economies of scale, consistency in quality practices worldwide, global flexibility and expertise in helping customers reach their goals.

The management at Elcoteq understands that there are several variables in selecting a manufacturing location: end customer location, complexity, types and volume of manufactured products, delivery location of the product among other factors. For these reasons, Elcoteq has established manufacturing plants in locations that offer the best opportunities to meet its customers' needs.

Expansion in Global Growth Areas

Last year Elcoteq made several major expansions to offer the best service and support to its customers in world areas where communications technology is growing most rapidly.

Elcoteq is the first high volume EMS company providing manufacturing services to India's network

Testing a network product during the manufacturing process.

infrastructure and handset OEMs. A new subsidiary was formed and began manufacturing handsets in Manaus, Brazil. In addition, Elcoteq signed its largest global outsourcing and acquisition agreement to date with Thomson. The deal includes acquisition of Thomson's manufacturing operation in Juarez, Mexico and manufacturing co-operation in the set-top box business making Elcoteq the leading volume producer of set-top boxes.

Elcoteq recently expanded its manufacturing plants in Tallinn, Estonia and has been the largest exporter in Estonia since 1994 with a 14 per cent share of exports in 2003. Additional operations are in Finland, Sweden, Germany, Hungary, China, Korea, Japan, and the United States. A new plant will be opened during 2005 in St. Petersburg, Russia.

What differentiates Elcoteq from its competitors is its exclusive focus on communications technology, customers and products. Elcoteq's strategy of specialization, establishing a global footprint, manufacturing practices and quality, has helped it achieve continued growth and become a proven leader in electronics manufacturing services for communications technology.

Information and Communications Technologies
New Business Practices and Innovations

Kaj Nordgren, Communications Manager | Tekes – National Technology Agency of Finland

Tekes is the main public funding organisation for research and development in Finland. Tekes funds industrial projects as well as projects in research organisations, and especially promotes innovative, risk-intensive projects. Tekes offers partners from abroad a gateway to the key technology players in Finland. www.tekes.fi/eng

The technology programmes and projects funded by the National Technology Agency of Finland, Tekes, invent and develop products, services, and applications for the benefit of information society and the players within.

Information and communications technologies (ICT) are the central element and driving force behind the changes taking place in the society and economic life. The companies representing ICT technologies amount to approximately 10 per cent of total Finnish entrepreneurship and to more than half of the nation's total R & D activities. Innovations and R & D activities have a major impact on companies within this field. In the companies dealing with software the investments in R & D may reach up to 30–45 per cent of the total turn over.

As a developer of information and communications technologies Finland has reached the position of a global forerunner being one of the most advanced countries in the world in adopting ICT. The challenge Finland faces is to secure that position in the future as well. In developing the basic technologies the aim must be to adapt and implement top level know-how and ICT on an ever widening scope of business activities. Finland's strengths in global competition continue to be expertise and specialization.

The demand for Tekes' funding for companies developing and implementing information and communications technologies grew steadily during 2004. The keen interest in the new type of funding devised by Tekes, namely a starting company's capital loan, was a clear indication of the dire need for funding especially among newly established ICT companies. Just about one half of the loan applications for that particular loan came from those companies. There is a surge of newly established companies especially in software products and communications development as well as ICT implementation.

In 2004 Tekes funded the development of information and communications technologies with more than 120 million euros. Space technology in Tekes is considered part of information and communications technologies unit and funding for space technology in 2004 was 18.5 million euros.

Technology Programme Activities Advancing Briskly

The major ongoing technology programmes during 2005 are AVALI focusing on the creation of business opportunities based on space technology, ELMO focusing on miniaturizing electronics, FENIX focusing on interactive computing, and FinnWell focusing on wellbeing. NETS – Networks of the Future formally ended in the very beginning of this year.

Among the results of the NETS technology programme is the study charting the future technology trends. According to the findings, the major challenges during 2007–2012 will be the consolidation of data network types and services, intelligent living environment, transition from network oriented to equipment oriented environment, and the accumulation of content. The aim is to move from the present technology centered thinking toward increasingly user-friendly technology development.

Health care sector is an important user of information and communications technologies. The FinnWell technology programme's underlying idea is to improve the profitability and quality of health care services.

There is plenty of future potential as well in the approximately 50 companies in Finland developing games technology. Several of these companies participate in FENIX technology programme within which Tekes has made breakthroughs in, among others, content business activities.

Among the information and communications technologies programmes brought to a conclusion last year were the space technology programme Antares and intelligent automation solutions development programme ÄLY.

Additionally, in the planning stages there are technology programmes focusing on business specific software, broadband technology, and mobile business solutions.

How to Get on the Top of PISA Tower...

...and other enigmas of lifelong learning in engineering education

Markku Markkula, Director | HUT Dipoli

"Putting e-learning tools to serve lifelong learning is very relevant today. Education systems are seriously facing the modernization challenge as brought up by the Lisbon process. The importance of flexible delivery modes and adaptable institutions is increasing, the scenario is changing on all levels."

Markku Markkula, Director of HUT Dipoli

In few years' time Finland has scored miraculously high almost on any scale of excellence. She has been awarded prizes like: "the most competitive economy", "the least corrupt country", "the home base of the most successful mobile phone company", "the best readers of the world", "the best students in maths in Europe", to mention a few.

Is this just a coincidence, or what is it that has made Finns so successful? There is no single or simple answer to that. We do not even try on answering, but let's have a closer look to some of the factors which might have something to do with the Finnish success story.

Prime Minister **Tony Blair**'s answer to the question of the priorities of his government some years ago was: "Education, education, education!" The answer became famous, but he and his government were not the first ones to put education on the top. The same order has certainly been true for long in Finland, claims **Matti Sinko**, Senior Expert at the Lifelong Learning Institute Dipoli of Helsinki University of Technology.

For Finns education has been not only a long-standing national priority but a success strategy for the homes as well. The teaching professions score continuously high in sociological studies when comparing the popularity of different professions. Consequently teacher education institutions have managed to gather year after year many of the brightest students of all faculties. Many of the best brains do not hesitate to go back to schools as teachers.

Lifelong Learning Sits Well with the Finns

The chairman of the Board of the Finnish information Society Development Centre TIEKE, **Markku Markkula**, is an enthusiastic developer of new concepts for continuing professional development and knowledge management. Markkula highlights that the concept of lifelong learning has been easy to introduce to the Finnish working life. We do believe in human capital as the main factor of social and economic progress on the personal and organizational, as well as on the national and even trans-national level.

Finns have not hesitated to resume a learner's role, whenever there has been an intellectual challenge to tackle. Our world record high investments on R&D have fuelled our small national economy to scale up to being competitive with anyone. We have a thorough understanding of knowledge based systems intelligence and innovation management on organizational, national, as well as regional levels, Markkula explains.

HELSINKI UNIVERSITY OF TECHNOLOGY
LIFELONG LEARNING INSTITUTE DIPOLI

in the forefront of technological development.

Lifelong Learning Institute Dipoli
P.O.Box 8000
02015 HUT

www.dipoli.hut.fi/english

The four corner-stones of success. Strong multidisciplinary approach to learning and professional development form the basis for design and delivery of services that Lifelong Learning Institute Dipoli is famous for among its customers and partners.

Specialising in technology and business know-how, HUT Dipoli is a recognised provider of lifelong learning and professional development programmes. Here participants of a seminar reflect on key concepts: innovation, motivation, productivity, systems intelligence – discovering hidden competences in human activity and organizational life.

Dipoli – a Forerunner in the Field of Continuing Education

Combined with the unbelievable curiosity and trust in technological strides has given a head-start also to Dipoli, the Lifelong Learning Institute of Helsinki University of Technology, to establish its reputation as one of the leading continuing engineering education institutes in Europe. With its full time staff of approximately 100, 14 Meuro annual turnover, and over 1,500 visiting lecturers per year Dipoli earns its place among the largest institutes in its field. It is Dipoli, where Markkula earns his living as the director of the institute.

Dipoli acts in the forefront of technological development, offering a wide range of continuing education programmes to engineers. Dipoli also contributes substantially to a great number of research and development programmes. By utilizing e-learning technologies and methods Dipoli aims at building readiness of its customers to respond to the needs of today's and future working life. Dipoli also hosts the teaching and learning support unit of its home university and the service unit of the Finnish Virtual University.

The community service responsibility of the universities has recently received a formal recognition in Finland, when this third mission or pillar, has been recently included in the Finnish legislation regulating and challenging the universities. Dipoli's long-established pivotal position between the academia and working life has put it once again in the pioneer role according to Markkula.

Global networking is an essential part of the activities of Dipoli. The institute is a founding member of EuroPACE. It is also an active participant in, for instance, SEFI (Société Européenne pour la Formation des Ingénieurs) and the Educational Multimedia Support Network (MENON). Since 1992, Dipoli has been a coordinator or a partner in approximately 160 European R&D and training projects increasingly focusing on foresight in education and training.

New Ways in Professional Training

Understanding the various ways to effectively support learning at workplace and how this learning support could be organized in the future, is one of our key success factors, outlines **Tapio Koskinen**, Senior Expert at Dipoli. This is also reflected in the institute's participation in two new European Networks contributing to the development of new ways in professional training. Teaching and Research in Engineering in Europe (TREE) is a thematic network supported by the Socrates programme. Dipoli takes the leading role of the sustainability of engineering competencies action line in this recently launched network. Strong emphasis on foresight characterizes also Dipoli's contribution to the Network of Excellence in Professional Learning (NoE ProLearn) a well-known initiative supported by the 6th Framework Programme of IST.

Finnish Open Source
Flying High from the Very Beginning

Jukka Matikainen, Marketing & Communications Manager | COSS

Finns have been the carrying forces and figureheads in the development of open source software. The Finnish Centre for Open Source Software, COSS, aims to keep Finland in the van of development regarding the use of open source in business, too.

Linux with its penguin logo is known as the flagship of the Finnish open source know-how. This operating system has risen to challenge Windows. **Linus Torvalds** who, at the time was studying computer science in the University of Helsinki, started to develop Linux in 1990.

Next year, Linus released the first version of the system on the Internet. He urged people to comment, test, and develop the software. Linus immediately got a huge amount of feedback and error reports. In 1992, almost 200 people were already actively working with Linux. The advancement of Linux contains the focal elements of the open source success story: openness, the Internet, and innovative software, which inspires accomplished people around the world to participate in the development work.

At present, Linus lives in San José, California. He continues to coordinate the development of Linux. His example has its own influence on the fact that Finns still have a significant role in numerous other well-known open source projects, such as MySQL and IRC.

COSS Developing Business Based on Open Source

Finnish employees are often characterized as self-directed and task oriented. This Finnish disposition seems to be well suited for open source projects, in which the developers independently implement different tasks and parts of the project as a whole.

A wide foundation of knowledge and long traditions form a strong basis for developing business based on open source. COSS (Centre for Open Source Software) started at the beginning of 2004 with basic funding granted by Finland's Ministry of the Interior.

COSS aims to improve co-operation between the companies that develop and use open source software. One of the main goals of COSS is to make different ways of utilizing open source known in different business sectors and user groups.

– There are two COSS directories on our Web site: companies and software. These directories help those who are looking for software and services for their organization to find matching solutions and corporate partners, says the Director of COSS, **Petri Räsänen**.

Among other things, COSS arranges meetings, organizes international co-operation, and offers various services to support business. COSS also offers legal services providing expert assistance in licensing and other juridical matters.

In Finland, COSS coordinates co-operation between various projects in different regions and lines of business, and stimulates research related to open source. One of COSS's active partners is the Häme Centre of Expertise in the city of Hämeenlinna.

Timo Väliharju, Managing Director, Mediamaisteri: **"We scrutinized everything together with the clients' data management departments."**

– The Häme Centre of Expertise focuses on supporting research on e-learning as well as product and company development. As a partner of COSS we are responsible for developing open source based business in the field of e-learning, says Director **Riikka Rahikainen**.

The Häme Centre of Expertise has also studied the use and distribution of open source software in Finnish education. According to the study, there seems to be growing interest in open source software applications in the field of education. Constantly tightening budgets, growing dissatisfaction with vendor power, and the lack of innovation in the proprietary learning technologies are the main reasons behind this trend.

About 60 % of Finnish schools of all levels are using open source software to carry out their practices. The most frequently used open source learning platform is Moodle.

The study anticipates a bright future for the educational open source software usage in Finland. However, it suggests that less passion and more real life experiments are needed, in order to make open source broadly used along the proprietary software in all markets: education, government and business.

The above-mentioned Moodle is a widely used open source solution – and not only within educational institutes. This learning platform works well as a competence development tool for various businesses, for example in the world of finance, as our next case shows.

"COSS wants Finland to lead the way in developing other parts of the open source ecosystem too. COSS participates actively in international co-operation. We convey Finnish open source know-how to various partners: for example internationally operating businesses, the public sector, and research institutes."

Petri Räsänen, the Director of COSS

Jari Heikkurinen, Department Manager, Pohjola Insurance Group: **"An open source solution is less risky than a closed system."**

Maija Nurmi, Development Manager, Suomi-yhtiö Insurance **"We used to have a commercial closed source platform. It was cumbersome to remove unnecessary functions from it."**

Riikka Rahikainen, Director, Häme Centre of Expertise: **"As a partner of COSS we are responsible for developing open source based business in the field of e-learning."**

Petri Räsänen, Director, COSS: **"There are two COSS directories on our Web site: companies and software."**

Open Source Software is Less Risky

Open source software is often associated with the images of high risk factors. A quite opposite analysis was made by some of the most significant and well-known Finnish companies in insurance, financing, and banking: Pohjola Group, Suomi-yhtiö, Savings Banks, and Ilmarinen. Moodle was selected as the platform for their common learning network.

– Our hands would have been tied far into the future by selecting a commercial closed source solution, yet the development can not be forecast reliably. In our opinion, an open source solution is less risky than a closed system, says Department Manager **Jari Heikkurinen** from Pohjola Insurance Group.

In addition to closed source code, the price would have been a restrictive factor when choosing a closed source solution. The initial costs of starting a wide commercial learning system would have required the investment to produce advantage for a long time. The corporate partners did not, however, want to bind themselves strictly to one closed source solution and its vendor.

Functionalities about the Same – Costs Vary Widely

Before this project the members of the steering group did not know much about the alternatives of open source. During discussions with Mediamaisteri Ltd, Moodle was mentioned and the steering group started to look into it. They discovered soon that Moodle, as well as other alternatives, had both advantages and disadvantages. Promises and features varied. However, each solution worked in its own way.

The importance of the price was then emphasized. The closed source solutions did not, after all, contain anything to justify their significantly higher costs when compared to an open source solution.

The steering group estimates that a learning environment based on Moodle will cost roughly five times less than a comparable system implemented with closed source code.

Modular Solutions are Safe and Easy to Customize

– We used to have a commercial closed source platform. It was cumbersome to remove unnecessary functions from it. They disturbed the learning of the subject matter, says Development Manager **Maija Nurmi** from Suomi-yhtiö Insurance.

In Moodle, each module of a project has its own person in charge. Parts can be developed independently. The modular structure ensures that Moodle adapts easily for different clients.

One of Moodle's focal features is its customability, which was decisive in selecting the open source solution. The learning environment will be developed further, and later the companies will make customized contents and solutions according to their needs.

Every now and then, there are groundless doubts about the data security of open source software.

– We scrutinized everything together with the clients' data management departments. Their standards were strict, but we found no problems in data security or anything else, says Managing Director **Timo Väliharju** from Mediamaisteri.

Mediamaisteri is closely involved in the Moodle project. However, the company does not strive to offer the newest applications and features to their clients at once.

The goals of these companies that produce added value to open source solutions are often different from the companies which have bound themselves to commercial software. An open source deliverer can participate in the project and simultaneously observe and evaluate the development work critically from a client's point of view. New features are profoundly tested instead of trying to vend new versions which are less than ready or only superficially improved, which sometimes happens if you try to sell products as early as possible.

The Gateway to Finnish Open Source

Open source has established itself as part of software business. Finnish open source software development has, from the very beginning, been of high quality at the grass roots, in practical software projects. Petri Räsänen, the Director of COSS, encourages all interested partners to contact COSS:

– You find our contact information at www.coss.fi. We are open to your ideas and co-operation opportunities!

Access to the Internet
A Matter of Equality

Heli Rantanen, Project Manager | OSKU Project

In 2001, Sitra – the Finnish National Fund for Research and Development – implemented an extensive information society project, OSKU (Oppivat seutukunnat – Learning Regions). Regional authorities, municipalities and local business and industry contributed to the funding and implementation of the two year-project. Altogether OSKU covered 180,000 inhabitants in eight regions in Finland.

Segregated Groups in Focus

The initiative proclaimed that ICT skills and use of the Internet benefit people in their day-to-day lives, improve quality of life and deliver new opportunities for individuals and communities.

In 2001, 59 per cent of the Finnish households had a computer and 43 per cent had an Internet connection. In sparsely populated rural areas the figures were substantially lower.

The digital divide was related to the lack of telecommunications infrastructure, but also to the lack of motivation and low skill levels. The main groups still segregated from the rapid ICT development were especially the elderly and people with low income and lower educational background; the unemployed, immigrants etc.

Sitra's objective was to find good practices and examples in drawing the segregated groups into information society by implementing local "grass root" actions.

Local Know-How Essential

The networks and cooperation skills of the local citizens, associations and volunteers, and their connections to other stake holders in the area were essential to the success of OSKU. Efficient communication tools (web sites, intranet systems) proved to be necessary, when the inhabitants wished to have an impact on issues concerning their environment. Digital dialogue with the municipality was needed, but the locals were also able to provide accurate 'inside' information into the net.

Photo: Patrik Lindström

Senior citizens appreciated peaceful and individual ICT -training sessions. Trainer Klaus Luohio had only two pupils at the time while teaching beginner's computer skills in Maunula.

Photo: Tuomo Jouste

In Eastern Turku suburbs a lot of immigrants benefited from the project. Children were eager to adopt new communication tools in every OSKU region.

Success in Narrowing the Gap

OSKU had a positive impact on information society development in several areas. Thousands of people without earlier ICT-education were encouraged to utilize the Internet, and computers and Internet connections were purchased more eagerly than in other areas nationwide. However, differences between rural and urban areas still exist.

Sustainability became a challenge, as not all the municipalities took responsibility for the activities after the project. All the services – education, local web portals, Internet access points – are quite expensive to maintain. A large network of access points was expensive to maintain. Provision of broadband connections to the distant rural areas and the quality and price of the broadband would be essential.

Only the permanent changes in the ways people use and benefit from digital technology in the daily life tell us, if the intervention of OSKU has been successful.

The writer, Heli Rantanen, architect and researcher was a Project Manager in one of Sitra's eight OSKU -projects, Nettimaunula, in Helsinki 2001-2003. All Sitra's activities are designed to promote the economic prosperity of the Finnish people. Email heli.rantanen@hut.fi

www.sitra.fi
www.sitra.fi/eng/index.asp?parent=871&DirID=92
www.kaupunginosat.net/maunula/kehittaminen/osku_engl.htm

Jyväskylä – Human Technology City
Known for Its User Friendly Internet Site

Markku Andersson, Mayor | City of Jyväskylä

The City of Jyväskylä's Internet site has received positive feedback from evaluations measuring, for instance, the site's user friendly quality. Already for the third time the site received top placement in comparison studies carried out by iTest Oy comparing 28 Finnish counties' corresponding sites.

Internet is a very important tool in the city's present operations. It is used to convey information and to serve the citizens, as well as for marketing activities to various parties. The site offers discussions and receives feedback from the users. It encourages the citizens into participation and offers an opportunity to have true influence on matters of common concern. Without the people in both ends of the Internet there, indeed, would be no Internet! Internet is not merely a "technological system" but, at its best, an interactive channel between people.

Clarity and User Friendliness the Key Elements

In developing Jyväskylä's Internet site special attention has been paid on clarity and user friendliness. The very core in the aims has been to strive for correct and up-to-date information and logical structure.

Especially during the last few years, the accessibility has been one of the heart-felt priorities. In the city's view accessibility is a two fold matter: technological and content related. The Internet site has to work browser or instrument independently. The texts must be univocally understandable and clearly structured, the search words and page searches must be in order, and the site navigation must be coherent.

An Internet Site Is Never Complete

The citizens are looking forward to the ability to carry out a growing number of concrete transactions in the net. Jyväskylä has, for example, received praise of its libraries' comprehensive www-pages and directories, regional lending service, and user training.

Photo: Kalevi Korhonen

During the last few years Jyväskylä has been, population wise, Finland's fastest growing city and the second most attractive migration target. The use of properties, zoning and construction, as well as the various modes of available housing, interest people. The city's Internet site offers the citizens the possibility to participate in the city planning with comments and questions. The city engineer's www-site contains numerous instructions and documents that aid in construction projects. Environment and waste collection receive equal attention. The Internet site also informs about the different housing sites' waste collection points, as well as provides advice on recycling, nature trails and, during the summer, the water condition of the beaches.

The questions sent by the citizens and other users of the site on various topics are answered by the corresponding county experts. The JyväskyläTori (= Jyväskylä-MeetingPlace) chat forum facilitates discussions on just about any topic under the sun and serves as a forum for private citizens and organization to post their announcements.

The Chance in Operational Culture Furthers Business Opportunities

The Internet has become a county organizations' permanent service channel. In the future that means ever more need for content expertise, changes in operational culture and, along with technological advances, growing need for increased competence. A part of usability issues can be solved with technology, however, it is most important to see beyond the Internet and focus on the person using the service and his needs. Technology merely functions as the servant.

Valokuvaamo Lehtinen

"The city's Internet site offers the citizens the possibility to participate in the city planning with comments and questions."

Markku Andersson, Mayor
City of Jyväskylä

eTampere Builds the Well-being of the Future

Ulla Hartikainen | eTampere

eTampere programme's general objective is to make the city of Tampere a global leader in the research, development, and application of issues related to the Knowledge Society. The starting point of the programme is to develop a sustainable knowledge society that supports active citizenship and innovative business.

eTampere is an extensive collaborate project to which the local educational and research institutes, businesses, government, organisations, and communities contribute their own expertise and input.

The eTampere programme consists of six independently operating sub-programmes: Information Society Institute (ISI), eBusiness Research Center (eBRC), Research and Evaluation Laboratory (RELab), eAccelerator, Technology Engine Programmes, and Infocity. The entire programme is coordinated by the eTampere office.

Ask for more information: info@etampere.fi, www.etampere.fi

Photo: Jyrki Luukkonen

"eTampere is critical but curious, daring but humble, a builder of the new that respects the old."

Jarmo Viteli, Director of eTampere-programme

eTampere concentrates on three themes:

1) Network services that ease citizens' daily lives are developed and brought within the reach of everyone.

2) The foundation of expertise in research and education is strengthened.

3) New innovative business is created.

Among the eTampere areas of emphasis are:

Company cooperation and e-business

eAccelerator strengthens cooperation particularly with medium-sized growth companies that have a strong link to industry

- A new model for capital investor cooperation, the "from idea to international success" concept, a financial and account management tool for growth companies, an expert pool in different areas of business

eBRC is a strong research centre and development programme seeking to understand business in knowledge society

- Business development, knowledge management, strategy forming in the knowledge society
- eSME service to facilitate the adoption of e-business in SMEs
- Venture – to – Capital (V2C)

Infocity focuses increasingly strongly on supporting the multi-channel development of public service processes

- Internet, mobile phones, digital TV
- on-line self-services
- new forms of eDemocracy
- access and training

Transfer of research knowledge into product development, products and services

RELab focuses on the development of industrial service-oriented products and business, and the transfer of research results to companies and communities

- through a development centre for service-oriented industrial business, companies in the region find practical answers to key factors for success in the world of service-oriented products

Technology Engines focus on the application of new technology and the utilization of research results in companies

- the Optoelectronics training and research centre is one example: SMEs, too, get access to the latest research knowledge, measuring services and training, increasingly efficiently and economically

ISI promotes the construction of a knowledge society based on active citizenship through multidisciplinary research, development and educational activities.

In four months' time, September to December 2004, 10,000 more SME's started to use eInvoicing in Finland.

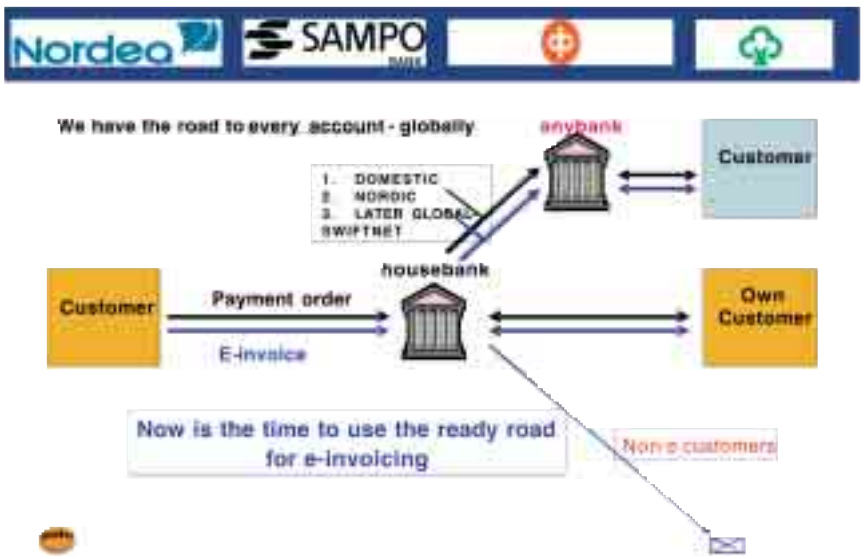
"eInvoicing LivingLabs" to the Resque of SME's

Technology Centre Kareltek Inc

eBusiness regional projects in Finland are referred to as "eInvoicing LivingLabs" with the focus to help SMEs to start implementing new ICT applications and employees to use them efficiently.

One of the main purposes of the regional projects is to speed up the adoption of eInvoicing in B2B and B2C with the regional target set to reach eInvoicing penetration level of 50 % in two years.

"By experience we have found out that in order to achieve this goal it is necessary to combine all regional players to support the project", tells Project Manager **Kari Korpela** from South-Karelia eBusiness region in South-Eastern Finland.



eInvoicing infrastructure in Finland

Larger Entities Serve as Catalysts

"Large companies and public organizations (often called ePioneers in Finland) have great interest in receiving eInvoices and, thus, on automating their supply chain management processes, procurement, and bookkeeping," explains Korpela.

The same desire is visible in Global Business networks which have become very important to SMEs. The first step large companies commonly demand from SME's is that they start utilizing eInvoices.

Software companies have to implement new eInvoice standards in their software applications, as the new eBusiness applications will give more freedom to spread and share the work between SME's and auditing companies.

Banks Play a Major Role

Banks play an important role being able to provide the needed infrastructure and a solid opportunity to ease the workload when transferring the document exchange with business partners into electronic form. In the Finnish example the banks have not only delivered the e-invoice format, but the Finnish Banker's Association's electronic Finvoice solution also includes a working model with role descriptions, responsibilities, and needed supporting routines for communication.

One of the main benefits of the work is that corporate customers of any size can now join the network with their preferred solution. For some this would be the NetBank, for others more advanced Enterprise Resource Planning ERP system. These two different interfaces will then interact and enable the parties to communicate.

Banks have also put a lot of effort to ensure that the straight through processing requirements will be fulfilled, having moved the focus further from mere workflow parts with the electronic images of the invoices.

Works Also in B2C Transactions

The solution will also cater to the needs of B2C eInvoicing. This way corporate customers can really start to streamline their invoicing based on their business needs instead of the availability of technical solutions, tells Vice President **Raimo Näätsaari** from Nordea Bank.

eInvoice is a win-win solution to all players bringing better competitiveness to the economy as a whole, however, only when the degree of usage of the eInvoices is high enough. In this, public financing could speed up the adoption of eInvoices by helping SMEs.

Regional eBusiness projects in different parts of Finland have an important role in the development in keeping all the players around the table by means of workshops, real-life testing, and by providing discussion forums. In that regard the eInvoicing LivingLab is a very important mechanism, tells Project Manager **Jarmo Kovero** from Päijät-Häme eBusiness region.

eBusiness portal www.eliiketoiminta.com
Kari Korpela, e-mail kari.korpela@kareltek.fi
Jarmo Kovero, e-mail jarmo.kovero@lahtisbp.fi

While companies that sell ICT products and services know and understand their own portfolio and skills, matching these to a new market is much easier with a little expert help. Moving into a new country to do business is not a complicated process as long as you know what to do. Plans made in isolation can turn out to be less than complete.

The software sector in Finland has a value of approximately 3,800 million euros. Non Finnish companies wishing to carve out a slice of this have two options: to operate from abroad, or set up a subsidiary company, possibly by acquiring an existing Finnish operation. The cost of doing business in Finland is very competitive. The corporate tax rate is one of the lowest in Europe, 26 per cent from 2005. Skills and know-how are available, literacy levels, including computer literacy, are high, and Finns are known for their positive approach to technology.

In software, the essential element is trust. In B2B operations in Finland, it is possible to get access to the end customer, something not always the case elsewhere. One quite clear result of this is that software companies move to a higher position in the value chain. Finland has often been cited as an ideal "test laboratory" for new products and services. People are technically oriented and keen to try new products.

High Quality R&D Infrastructure

The ICT cluster in Finland has been much helped by public investment in high quality research and development of infrastructure, and by one of the world's most effective schemes for funding research and development activity. Finland also has several unique resources such as Octopus, SoftaTest and FENIX, National Technology Agency of Finland Tekes' technology programs. The result has been a very rapid growth in the ICT sector over the last ten years.

Octopus is a unique network set up to promote the creation and development of new mobile services. Offering support all the way from initial innovation through development and testing to marketing, Octopus provides companies operating in Finland with an advanced platform for testing new mobile applications and services in a genuine operating environment. SoftaTest offers an extensive contact network which provides access to companies and resources, to joint development programs run by companies and educational institutions, and to services provided by its Mobile Lab.

The primary goal of FENIX is the development of user-friendly application technologies and products or services for consumers, corporations, and public bodies.

Invest in Finland's ICT team at your service. Tuija Tommila (left), Oili Liukkonen, Sari Tanskanen, Atso Vainio, and Mari Kankaanranta. Taneli Saari is missing from the picture.

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Easy Going Markets and Highly Efficient Business Environment

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In its mission statement, targets of the FENIX program are said to be product based businesses and projects which 'contribute to competitiveness and know-how in the long run'. Commenting on the program, **Klaus Oesch**, FENIX Program Manager, said "This is investing in the information society, not just technology, in the way people educate themselves in the information society. It is also about communities, how they are developing and creating content. FENIX is certain to provide new openings and opportunities for product development and new applications."

Expert Advice and Assistance

Invest in Finland is a government agency whose task is to provide help and assistance to companies who wish to establish operations in Finland. Many of the questions asked by Invest in Finland's clients are of a down-to-earth nature – such as the cost of renting office space. There are more general questions: What about languages, levels of computer literacy? How does staff recruitment work? Other queries are more specific: Are there reliable sources of information on consumer or company behaviour?

Invest in Finland offers assistance in researching alternative ways to establish or expand a presence in Finland. Questions, that Invest in Finland is in a unique position to provide assistance with, include those concerning salary levels and labour costs, the types of support that are available, and the best ways of expanding into Finland – opening a sales office, acquiring a Finnish company, setting up a research and development facility and/or manufacturing unit, or expanding existing operations.

Successful Entry to the Finnish market

In the middle of December 2004, city of Lappeenranta based Technology Center Kareltek Inc. (Kareltek) signed a cooperation contract with Ardin Software Oy, a Russian-owned company which has been operating in the Helsinki Metropolitan Area for two years. Ardin Software works in close cooperation with the Russian company Arcadia Inc. providing software services for clients

"We can act as a channel between local and Russian companies and offer top Russian expertise."

Arcady Khotin, Managing Director of Ardin Software

located mostly in Scandinavia. Ardin Software also represents other Russian companies that work in the same sector.

Ardin Software's second step has been an expansion in Finland and moving to Technology Center Kareltek. "Establishing a business in Lappeenranta helps us assist local companies in creating connections with Russian high-tech companies and research facilities. We can act as a channel between local and Russian companies and offer top Russian expertise. We will also be hiring local people to take care of our business here", tells **Arcady Khotin**, Managing Director of Ardin Software Oy, a St. Petersburg-based software company.

"Every Day Offers Something New"

Khotin is pleased with the assistance received in Finland. "Invest in Finland did an excellent job for us. Without them we probably would not have dared to come. They gave us a lot of useful information", tells Khotin and adds, "Finland is not a corrupt country. I received fair treatment. For me, every day here offers something new. It gives me energy. I love it."

Future prospects for the Finnish ICT sector, and Ardin Software's business, look bright. According to a report on software sector prospects published in December 2004, 75 per cent of the software companies operating in Finland expect their turnover to increase. In Khotin's words: "The industry is warming up again, the demand is here".

Website Service for Investors

As part of its website, Invest in Finland has an on-line service that enables companies to register at the site for free and request information packages on specific sectors or areas of investment.

Invest in Finland helps foreign companies to locate in Finland and take advantage of the region's competitive business environment. It works as an efficient link between foreign and domestic companies and it provides all the information required to establish a business in Finland.

Finnish Wellbeing Center
an Innovative Landing to Japan

Mauno Konttinen, Deputy Director General | STAKES

What does "Finnish Wellbeing Center" or "FWBC" mean? The answer is: the name and trade mark of a recent Finnish innovation, which comprises a modern Finnish elderly care concept complemented by advanced Finnish technology.

Sendan-no-yakata "Terve" elderly care facility in Sendai, Japan

The core of the concept is "Sendai Sun" service delivery model. The first real application of the entity has been erected in the City of Sendai, around 330 kilometers northeast from Tokyo, where a new elderly care facility opened its doors in December 2004. In its close vicinity, a research and development institution will be inaugurated in March 2005. In the Japanese welfare market, the concept "Finnish Wellbeing Center" is already known as a brand.

Japan is one of the fastest ageing nations in the world. The recent and still on-going profound societal changes in Japanese family and working life steer the trend towards institutional care of senior citizens. In Finland, the direction is opposite, i.e. towards the support of independent or autonomous living in home-like conditions. Japanese authorities and experts have, for a long time, taken a close look at the Nordic and, especially, the Finnish model of elderly care.

"Sendai-Finland Wellbeing Center"

The "Sendai-Finland Wellbeing Center" is the name of a complex consisting of two adjacent buildings in the Mizunomori area, around four kilometers northwest from downtown Sendai. The bigger building is an elderly care facility, already completed, and the smaller one – a research and development center, will be completed in March 2005.

Sendan-no-yakata "Terve" is the name of the special nursing home. Its 5-floor, 5,500 sq m premises offer single rooms for 120 clients: 100 beds for long-term care and 20 beds for short-term stay. In addition, there exists a day care unit for 15 clients, rooms for rehabilitation, recreation and hobbies, as well as – of course – a Finnish sauna with pool. The house is largely equipped with Finnish furniture and accessories, including several pieces of Finnish IT know-how. The feasibility and functionality of many IT solutions – including a small IT platform and wireless monitoring of motion capability – will be further tested for the best of the clients and/or the staff. The functional care concept is based on the "Sendai Sun" seamless care model, which emphasizes the dignity, autonomy, activity, and rehabilitation of senior citizens and facilitates their integration to the surrounding society. The keys to achieve these goals are a well-trained and motivated personnel and well-managed professional teamwork. An integral part of this working method is the skillful, frequent use of modern IT equipment.

Sendai-Finland Wellbeing Center R&D Unit, in the close vicinity of the care facility, comprises about 1,000 sq m of meeting rooms, an exhibition space and eight office rooms to be rented to academic institutions, researchers, and welfare companies. The Unit will serve as a scientific research facility, technology development agency, and business incubation hatchery in the field of aging, related services, geriatrics, gerontology, and gerontechnology. Several Japanese-Finnish joint projects will be conducted in the field of IT.

View from an individual room

Sendai cafeteria

FWBC Finland Oy

During the planning phase of the FWBC Project, 16 Finnish welfare industry companies, mostly SME's, joined the project to introduce their products to the FWBC complex, and on a broader base, to the Japanese welfare market. Later on, 11 of these companies established a joint stock company – FWBC Finland Oy – for further promotion and marketing of the unique FWBC care concept and integrated technical products. Also a subsidiary of the company – FWBC Japan Ltd – has been founded in Sendai.

Combination of Service Expertise and Advanced Technology

A New Export Product

The uniqueness of the described end-product of the project is based on the inseparable integration of a good, tested, and validated Finnish care concept and Finnish high-tech welfare products, including several IT systems, applications, and equipment. The end-product can be divided into smaller, independent functional modules for further marketing. By combining various know-how and product modules, the requirements of new customers can be tailored case by case.

According to a recent report launched by the Finnish Ministry and Trade and Industry, it is of extreme importance to promote innovations in the field of service expertise and advanced technology to new products for the needs of ageing societies. In practice, when developing new services for silver citizens, information and communication technology is in key position, for instance to promote the use of virtual services. New potential service concepts should be effectively identified, developed, conducted to products, and "branded". To manage in this work, public-private partnership is an essential prerequisite. All above principles and goals have in good style been achieved in the Finnish Wellbeing Center project. The international propagation of the end-product still requires further efforts.

The author is the Deputy Director General of the Finnish National Research and Development Centre for Welfare and Health STAKES, working for the FWBC Project since the beginning of 2004 in the service of Finpro, the organization promoting the globalization of Finnish trade.

Home automation used to be a luxurious dream with overwhelming design costs. In Finland these dreams have been turned to everyday reality even for builders of one-family homes through mass tailoring software and standardization.

New Era of Building Management

Anu Kätkä, Marketing Director | Lonix Oy

Smart homes are now easy to buy. Intelligent building technology is available as a complete package with automated tailoring for customer requirements.

Previously a builder of a one-family home had to deal with at least four different vendors. Now automation is packaged with the rest of the building technology, thus the customer gets the total package as a turn key solution. Smart building management systems ensure not only superior indoor comfort and outstanding security, but also minimized operating costs of the facility.

The foundation of the concept is the building operating system, named COBA (Connected Open Building Automation). COBA definitions were created in a standardization project of companies representing various industries, from telecommunications to construction and services. When the standardization project started, its vision was to create an operating system for buildings, which would offer an open standard for easy and secure access to building functionality. Today the technology is in extensive commercial use. The vision proved to be right already in the first projects.

Common Interface Connects Building Management Systems

The building operating system offers a common interface to all facility management systems: heating, cooling, ventilation, lighting, consumption metering, access control, video surveillance as well as burglar, fire and humidity alarms. The definitions also include modeling of buildings, spaces, devices, systems, and users in accordance with International Alliance for Interoperability's IFC model. The IFC concept is based on the idea of objects brought together in an integrated model.

The efficient design and implementation process is based on open interfaces and modeling. The designer collects the requirements and designs the solution utilizing ready models and templates. The integrator completes the project using efficient tools that automate most of the programming work. In the end, the buyer can compare what was designed and simulated with what was implemented. Integration allows different building management systems to work together seamlessly and to be controlled according to needs and situations.

So what does COBA enable in concrete terms? Premium quality building management systems implemented with minimal costs. Smooth electronic system creation process with drastically improved efficiency. No manual work, no errors. Mass-production of mass-customized building management systems. Glue between construction and ICT clusters.

Smart home is not a new idea, and it has been approached from many viewpoints. Some focus on networking household appliances, others on entertainment electronics. The most fundamental source of added value and, thus, the most natural approach is building technology. When the inhabitants in the residence change, they usually take their stereos with them. Building technology remains in the building. A building operating system, like COBA, can be utilized for networking entertainment and household devices efficiently with the building technology.

Gaining full benefits from this forefront technology on a global scale will require networking of excellent companies in each market. In the past, Finnish companies had strong influence on creation of the GSM standard. The same could be now happening in the field of building management systems.

Lonix provides core technologies of smart building management systems. In addition to Finland, the company has references in Sweden, Norway, Russia, China, and Middle East. www.lonix.com www.coba-group.com

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Ellibs initiated the eBook technology project in 2002 together with Finnish telecommunications operator Elisa and the Undergraduate Library of Helsinki University. By 2004 the amount of customers grew to over 200, including universities, educational organisations, and enterprises in Finland and Sweden. The electronic book has become an information tool among students and professionals in Northern Europe.

Kristian Laiho, the founder of Ellibs Ltd, built his business plan based on research made during the Internet boom. "I was looking for business opportunities as project manager in a turbulent new media enterprise. I learned about content and earning problematics of portal operators, and started to search for a new approach to replace the 'supplier – channel – advertisement' – thinking."

Over Half of the Finnish Polytechnics use Ellibs Web Library

Today Ellibs represents nearly hundred scholarly literature publishers while the number of eBooks is expected to grow to 20,000. Among the well-known publishers are Palgrave Macmillan, WSOY, Edita, and Otava. In addition to commercial publishers, the selection will grow with publications of research organizations and universities in Europe. The most recent contracts have been signed with British Taylor & Francis and Nordiska Afrika Institutet of University of Uppsala, which start publishing eBooks during the spring 2005.

Finnish educational organizations have adopted the use of eBooks. Over half of the Polytechnics have acquired Ellibs Web Library. In addition, for SMEs Ellibs offers Personal Web Library – a software with which a purchaser of a book can borrow an eBook without having to use any intranet or library portals.

Ellibs Aims at Becoming European-Wide Operator

Ellibs will launch its Web Library in London Book Fair in March 2005. "Our aim is to build a European information delivery channel, from publisher to end-user using the well-established library infrastructure as a procurement channel. Marketing and contents will be operated locally while the technology is managed in Finland", tells Kristian Laiho.

Ellibs together with the Undergraduate Library of Helsinki University copied operation mechanisms of a library in order to procure eBooks in a traditional way. The published books will be converted to eBooks with Digital Right Management (DRM). It allows the publisher decide what the borrower or purchaser is allowed to do with the book. eBook can also be borrowed from a library web-portal using the pin code on the library card.

Ellibs has taken into consideration the earning logic and the procurement culture of libraries. The earning logic is based on books sold, like that of book stores, and on Web libraries. "Our earning logic increases profits of publishers and drops procurement costs of books. Everybody wins."

What Do Libraries Think of eBooks

The Undergraduate Library of Helsinki University, the biggest among the Finnish student libraries, has tried to resolve the insufficiency of textbooks with other universities through new publication and distribution solutions.

"The distribution of eBooks is new for our customers. The feedback received from the students has mostly been positive. Some questions have arisen concerning downloading and other technical issues. The eBook service works as a useful supplement in addition to conventional material," says **Matti Hjerppe**, the Director of the Undergraduate Library.

Northern Cultural Heritage Meets High-Technology
AirBuccaneers

Tony Manninen | LudoCraft Game Design and Research Unit, Department of Information Processing Science, University of Oulu

LudoCraft/Department of Information Processing Science 2005

Digital games take the lifeless core of high-technology and give it a heart of fun and entertainment. The increasing presence of games and the game culture is undeniable. Digital gaming draws people to technological frontiers fulfilling their potential with dreams and aspirations, and with fragments of everyday life – things that ultimately matter the most.

Yet the possibilities offered by gaming have not been systematically explored – what impact could games, in their myriad of solutions, have on the larger world of digital communication?

To harness these possibilities and to explore possible answers, LudoCraft combines scientific, experimental approaches with artistic production and high-technology development.

As a response to the changing times, the field of digital interaction needs a face-lift: new innovations, new solutions, new concepts for interpersonal mediation and communication. In spite of this need, the vast array of possible solutions already implemented in multiplayer digital games has largely gone unnoticed: from rich interaction to tailored contexts, games offer a wide range of communication and collaboration models.

Furthermore, many issues tackled by computer games are practically absent from the field of digital communication and its applications: designed user roles, narrative sequencing, simulation and environmental presence, time-critical usability, etc. The wealth of interaction offered by gaming is exceptional – it might well be unparalleled in the digital world.

To pick just one concrete example: the lack of intuitive signs of interaction has been a persistent problem in digital communication, separating it from face-to-face

LUDOCRAFT IN BRIEF

LudoCraft studies games and applies the theoretical knowledge into game design. The approach combines theoretical, technical and artistic expertise in serving both the academic and the practitioner communities. The mission of LudoCraft is to distribute the knowledge of analytical gamers and game designers for the benefit of wider audience. See http://ludocraft.oulu.fi

Ludo – Theories of game and play
Craft – Art of game design and development
LudoCraft = The Art of Designing and Creating Games and Play

encounters. Yet, from the world of digital games one can easily find new perspective on this problem: gaming provides a wide range of implementations of versatile self-expression, promoting a broader view of interaction.

A Line of Novel Applications New Solutions for Communication

To explore and develop new solutions for communication and collaboration, LudoCraft has designed a line of novel applications based on game technology, harnessing cutting-edge third-party platforms. These applications can be used as scenarios of collaboration both locally and globally.

Among these applications is AirBuccaneers, a team-focused multiplayer game that emphasizes co-operation. Implemented as a culmination point of previous research, the design of AirBuccaneers employs a variety of theories, both loaned and constructed. The theoretical framework laid out by the research has enabled LudoCraft to emphasize specific areas of interpersonal interaction.

Yet game without a strongly developed background presents a shallow experience, no matter how competent its technology. Without a world behind it, game has no hook to draw the players in, no depth for immersion. Indeed, most of the leading brands of digital gaming are based on content - worlds, characters, genres, and styles – rather than on technology.

This is characteristic to game development: the technical implementation and design must constantly be balanced against artistic content, with an eye towards a seamless whole. Here lies also the reason why LudoCraft takes a holistic approach to gaming: to truly understand and develop digital games, all areas essential to gaming must be present and accounted for.

Inspired by Cultural Heritage – Legends, Mythology, and History

When planning the world of AirBuccaneers, LudoCraft turned towards a source rich in potential, but rarely used in gaming: the cultural heritage – legends, mythology, and history – of their native Finland and its neighboring areas. This source had many merits: operating in an academic environment, LudoCraft is surrounded by a wealth of human expertise and material on the Finnish heritage. This enabled the use of an existing and robust knowledge network, without the need to establish a new one.

Towards this rich material base, a systematic approach was formed: when a piece of legend or mythology was adopted into AirBuccaneers, it was translated into a designed vision of the world: common, important elements were inserted, polishing the material towards the needs of the gameplay.

This combination of a powerful knowledge network and a flexible and systematic approach yielded great results. It allowed LudoCraft to establish a deeply rooted sense of a wider world surrounding the game, but did not unnecessarily constrain the gameplay development.

Additionally, the Finnish mythology proved to be a treasure trove for fantasy with a distinct, exotic character. Through the years, the fantasy genre has shown exceptional staying power in digital gaming – practically every period of time contains milestone games in the genre. This is not surprising: the potential for escapism, offering worlds beyond our daily reality, is a strong suit for both digital games and fantasy – their assets are convergent. Yet there is always the danger of taking a tried and true solution too many times. In light of this, mythological sources were used as a method of providing twists to the fantasy genre, which is arguably in danger of becoming too stale and repetitive.

Experimenting in a Systematic Manner

One of the major principles of LudoCraft is to be experimental in a systematic manner: to explore and to analyze. This was also true in the case of AirBuccaneers, and its development. From the interaction design to the exploration of cultural heritage, the aim of LudoCraft was both to develop the best application possible, and to use that development for experimentation and studying in order to best learn from the work undertaken.

LudoCraft believes in holistic design of interaction, content, and environment; the necessity of combining artistic vision with technological excellence; the encapsulating power of theory and analysis; and the undiscovered potential of game design.

One should never lose sight of the potential: the greatest goal of interaction lies not in the seamless replication of the real world – it lies somewhere yet to be seen, yet to be invented... somewhere anew.

In the Cross Roads of Development
from "ICT-simple" to "ICT-complex"

Juhani Strömberg, Senior Vice President, Group Development and Jyrki Poteri, Vice President, Value Networks | TietoEnator

Information society is linked to the 3rd phase of industrial revolution – the service industrial revolution. Digitalization, software, and networks are now in this century the underlying drivers. Increasing share of GNP will be services produced, distributed, and consumed through networks.

ICT's Main Role Is to Support Processes

Consequently, industries turn from "ICT-simple", to "ICT-complex". In ICT-complex industries, customers pay for products and services based on software. The ICT value potential, while being not only process related but directly product and service related as well, is essentially infinite. ICT as an asset is absolutely critical. A decisive bottleneck of business development is the management capability of ICT and agility. Core system modernizations represent the ultimate challenge. Generic, horizontal ICT solutions are often inadequate and insufficient. Vertically orientated and customer intimate services are needed.

The focus of TietoEnator's vertical growth is on the ICT-complex industries with Nordic strength, like telecom and banking. TietoEnator's value proposition is based on increasing sophistication of service concepts and on vertical solutions. Joinsourcing, Core Application Modernization Partnership, Solution Partnership, and Digitalization Partnership are examples of TietoEnator's offerings.

Longer Value Chains and Globalization

Digital value chains tend to become longer. ICT-complex businesses not only need sophisticated internal systems but services supporting end-to-end chains crossing company borders. TietoEnator's core system related services are complemented by those related to business process integration. TietoEnator's Value Networks together with Digital Innovations provide advanced digitalization offerings for these needs.

TietoEnator is one of the leading architects in building a more efficient information society and the largest IT services company in the Nordic countries.

www.tietoenator.com

Service industrial revolution means also globalization. Developing countries provide growing abundance of high-quality ICT-skills. Improving global network infrastructure enables wide-spread utilization of these assets. This trend started predominantly as cost-reduction-driven. However, the great opportunity is using the unlimited resources for agility – for solving the severe challenge of ICT-complex businesses. For this capability, one needs a fine tuned end-to-end ICT-value chain with industrial process management systems and scale. TietoEnator proactively develops this capability by building a network of global competence centres, own and alliance based, in the Baltic countries, Czech, India, and Russia.

Integration Service Preferred Over Own Investment

Improvement demands for cost, quality, delivery times, and customer service require tighter and more automated business process integration. The business environment is dynamic, which sets special demands for the ICT integration agility. This development has created the need for higher level infrastructure to support digitalization and changed processes between the business partners. Organizations have an increasing interest to get B2B integration as a service, instead of investing in their own infrastructures and competencies.

To connect and adapt business systems and local integration solutions between business partners, banks, and authorities TietoEnator has build B2B integration service offering. Value added network services for end-to-end business process integration support e.g. supply chain management, governmental information exchange, and invoice management. By one million B2B transactions per day TietoEnator's Value Networks unit is the leading B2B integration service provider in Europe. Its local expertise in Germany, Sweden, and Finland is complemented by a competence unit in Lithuania.

"What is most important to the information society is not new technology but a new way of doing things."

Jyrki Katainen
Chairperson of the Committee for the Future, Member of Parliament

Pekka Himanen: Challenges of the Global Information Society

The Committee for the Future of the Finnish Parliament asked Dr. Pekka Himanen of the Helsinki Institute for Information Technology to prepare a report that looks at the global challenges of the information society and suggests one alternative for meeting these challenges: the model of the information society combined with the welfare state.

The main ideas presented in the report apply universally: the global development of the information society has reached a phase that requires new actions from us all. In short, the idea of the information society can be defined as a creative society that is based on interaction. What is most important to the information society is not new technology but a new way of doing things.

The review comes to the conclusion that the most critical aspect in the development of the information society is the development of the deep-set structures of society. The information society agenda is not the same as an information network or Internet programme. The development of technology will help only when it is combined with changes in the underlying structures.

The report discusses the global trends behind the need to change our society, and lists values which could serve as the basis for the continued combination of the welfare state and the information society. A successful reform requires value-based management from politicians.

Our hope is that the report can be used as a basis for fruitful discussions concerning the building of a future sustainable information society. ❙

The review by Dr. Himanen can be found at www.eduskunta.fi/efakta/vk/tuv/challenges_of_the_globalinformationsociety.pdf

"The report presents a strategy for ensuring the competitiveness of the Finnish work and production in the face of increasing global competition."

Anne Brunila
Chairperson of the steering group of the project, Director General of the Ministry of Finance

Report on Finland in the Global Economy: Competence, Openness and Renewability

The Prime Minister's Office launched the "Finland in the Global Economy" -project at the initiative of Prime Minister Matti Vanhanen in January 2004. The aim of the project was to investigate the challenges and opportunities of the ongoing transition in the global economy on the Finnish economy. The final report, "Finland's Competence, Openness and Renewability", was submitted to Prime Minister in November 2004.

The final report presents a strategy for ensuring the competitiveness of the Finnish work and production in the face of increasing global competition. The strategy and key proposals for action are based on high level of competence, R&D and innovations. The key for Finland to succeed in global competition is to focus on being an economy and a society based on a high level of expertise. Although Finland's education and innovation systems are world leaders in many respects, there are shortcomings that must be tackled urgently to maintain international competitiveness. Determined investments in improving competence and in the functioning of the innovation system will enable Finland to exploit the new potential of large, rapidly emerging markets. Increasing openness, well functioning product and labour markets and above all the ability to transform and renew itself are also crucial elements of the strategy.

In addition to the final report, the Prime Minister's Office published numerous background studies and a summary report covering over 20 sector-specific dialogues organised between social partners as an input to the project. ❙

The Report is available at http://www.government.fi/tiedostot/pdf/en/91776.pdf

"The programme aims to develop the knowledge, skills and networks of decision-makers in the Finnish society so that they can handle the challenges facing Finland in the future."

Ulla Hytti
Research Manager in Small Business Institute of Turku School of Economics and Business Administration

Best before 01012015

Finland 2015 programme of the Finnish National Fund for Research and Development (Sitra) aimed to develop the knowledge, skills and networks of decision-makers in our society so that they can handle the challenges facing Finland in the future. It is Sitra's vision that by the year 2010 Finland will be one of the three most successful countries in the world.

One of the six courses forming the Finland 2015 programme was "Future Makers 2015" bringing together a group of young people from different economic, social and cultural backgrounds to find out how we see the future of Finland and the Finnish people. Besides the completed or ongoing university studies we had nothing in common, except that we had been born after 1968.

We promoted the necessity of immigrants for Finland. Finland needs immigrants for cultural diversity that brings about creativity and dynamics. We identified that the work of tomorrow will have totally different meaning than the work yesterday as the ways to work change dramatically. The aging population creates a necessity to analyse the concept of welfare society from a new perspective. We asked what kind of structures will best secure the provision of welfare services in an efficient manner. We also identified the need to prevent social exclusion and to increase ways for people to take part in civil society. The role of the third sector is pivotal in this sense.

Finally, we also acknowledged that Finland does not exist in a vacuum but is part of the global systems and hence issues like, the EU, globalisation, human rights, fair world trade and environment are important also for Finland and the Finnish people. ❙

The publication is available in English at http://194.100.30.11/suomi2015/

Finland in Brief

Photo: Futureimagebank

Geography
- seventh largest country in Europe
- 338,000 square kilometres, of which 10 % is water and 69 % forest
- 187,888 lakes, 5,100 rapids and 179,584 islands
- Europe's largest archipelago, including the semi-autonomous province of Åland

Distances
- 1,160 km north to south, 540 km west to east
- Finland's land border with Russia (1,269 km) is the eastern border of the European Union
- Neighbouring countries: Sweden, Norway, Russia, Estonia

Climate
The climate of Finland is marked by cold winters and fairly warm summers. In the far north of the country the sun does not set for about 73 days, producing the white nights of summer. In winter the sun remains below the horizon for 51 days in the far north.

In summer the temperature quite often rises to +20 Celsius or more and occasionally goes close to +30 in southern and eastern parts of the country. In winter, temperatures of -20 Celsius are not uncommon in many areas. Finnish Lapland invariably has the lowest winter temperatures. The mean temperature in Helsinki in July is +17 Celsius and in February -5.7 Celsius.

People
Population:
- 5.2 million, 17 inhabitants per square kilometre
- 67 % live in towns or urban areas, 33 % in rural areas

Capital:
- Helsinki (559,000), about one million people live in the Helsinki metropolitan area

Other Cities & Population:
- Espoo (224,000)
- Tampere (201,000)
- Vantaa (184,000)
- Turku (175,000)
- Oulu (126,000).

Finland has a Sami (Lapp) population of 6,500.

Languages
Finland has two official languages: Finnish and Swedish. Finnish is spoken by 91,3 % and Swedish by 5,4 % of the population. Sami (Lappish) is the mother tongue of about 1,700 people.

Religion
85,6 % Lutheran
about 1 % Orthodox

Local Time
+2 hrs GMT

Governance & Legislature
The Head of State is the President of the Republic. The President is elected for a six-year term by direct popular vote. Since March 1, 2000, the President is Tarja Halonen.

The Council of State is the Government. The new coalition government formed in June 2003, is headed by Prime Minister Matti Vanhanen (Centre Party). The government consists of the Centre Party, the Social Democratic Party and the Swedish People's Party.

Finland has a unicameral Parliament with 200 members. The members are elected for a four-year term by direct popular vote under a system of proportional representation. The president is empowered to dissolve the Parliament.

Finland in the International Community
Member of EU, UN, OECD and WTO, among others.

Economy
- GDP (2003 estim.): 143,3 billion euros
- GDP per capita (2003 estim.) 27,496 euros

Foreign trade (2004):
- Imports 40,27 billion euros
- Exports 48,79 billion euros

Major Exports:
Electronic and electrical products, pulp and paper, machinery and equipment, metal products, transport vehicles, timber and wood, chemicals.

Foreign Investments
- from Finland (2003 estim.): 54,4 billion euros
- to Finland (2003 estim.): 36,7 billion euros

Unemployment rate (Jan. 2005): 9,8 %

Education
- Population with educational qualification (upper secondary schools, vocational schools and colleges, polytechnics or universities): 61,9 %

Female entrants and degrees in Higher Education:
- Entrants 55,9 %
- Master's degree holders 59,9 %
- Doctor's degree holders 46,5 %

Broadband connections
(Dec. 2004):
- in use in 30 % of the households
- available to 94 % of the households

Sources: Statistics Finland, Finnfacts, Virtual Finland, Ministry of Transport and Communications, Finnish Customs

http://e.finland.fi

A Window to Finnish Information Society

The site brings you to Finland, the technological heartland of Northern Europe.

e.finland.fi offers its visitors accurate and up-to-date information on Finnish ICT know-how and Finnish Information Society functions and solutions in a nutshell, introducing Finland as what it has rapidly become a country where Information Society of tomorrow is a reality today.

The daily updated site offers information in the form of timely expert articles, statistics, and fresh news on a wide range of Information Society related topics under the main headings of eBusiness, eGovernment, eEducation & eCulture, Mobility, and Research & Development.

Joint Venture in Wide Cooperation

e.finland.fi is built and maintained in wide cooperation with several ministries and national promoters of information society. The basic idea of the site is to provide all interested parties a single site offering a concentration of Finland's information society activities, thus eliminating the need to search for information from several sources.

Partners:

Ministry for Foreign Affairs
http://www.formin.fi

Ministry of Finance
http://www.vm.fi

Ministry of Transport and Communications
http://www.mintc.fi

National Technology Agency Tekes
http://www.tekes.fi

TIEKE Finnish Information Society Development Centre
http://www.tieke.fi

finland

A Window to Finnish Information Society

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Welcome to the Meeting Point for Information Society Developers

Search PERTTI Database using Keywords
http://palvelut.tieke.fi/pertti/search.eng.shtml

Search PERTTI Database using IT Classification
http://palvelut.tieke.fi/pertti/search.eng.tlx.shtml

TIEKE Finnish Information Society Development Centre

has a key networking role as a neutral and non-profit organization in promoting the efforts of its members, within the public and private sectors alike, with an ultimate goal to create viable tools and expertise for the use of information society.

TIEKE Finnish Information Society Development Centre has initiated and runs an open network of various players operating in information technology industry. The operations of ICT Cluster focus on projects and services covering current topics. As of today, the members of ICT Cluster represent a variety of business enterprises, universities, technology centres, and industry associations, assuming their role either as suppliers or users.

PERTTI Database Service for ICT Cluster Networking

PERTTI is a database service operating since 1994 for Finnish companies to introduce their expertise to potential partners, both domestic and foreign. The database includes contact information for over 150 Finnish partners. PERTTI allows searches for information as well as transmission of calls for bid and co-operation. The service is free of charge.

TIEKE Finnish Information Society Development Centre