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ICT CLUSTER FINLAND **REVIEW 2006**



Finland's EU Presidency and the Information Society

Finland will hold the Presidency of the European Union from 1st July to 31st December 2006. As Finns, we would like to promote collaboration between EU member countries also with regard to the information society. This, in turn, presents many challenges both Europe-wide and globally.

Finland has, for many years, ranked highly in international comparisons as an information society. We believe that we still have a lot to show in terms of gaining good results in private and public sector collaboration. As Finland invests more and more in information and communications technology there is, concurrently, a strong focus on productivity, social development and welfare.

Applying and using ICT brings many benefits, but there are also less desirable side-effects. Information security is one of the key themes to be discussed during Finland's presidency. This theme is intrinsically connected with the ubiquitous information environment of the future. We will be surrounded by information at every level. Building and maintaining trust is one of the central challenges of an open society.

TIEKE Finnish Information Society Development Centre has a key networking role as a neutral and non-profit organisation. It also has a vital role in initiating concrete projects with its members and other actors to promote the information society. ICT Cluster Review Finland 2006 is an example of this networked collaboration.

ICT Cluster Review Finland 2006 offers insights into topical themes in the Finnish information society. The publication features contributions on innovative thoughts, products and practices by the information society's leading players. We sincerely hope that these articles encourage and inspire our readers to partake in building the information society.

The journey towards a true information society continues also after Finland's EU presidency. In the future, too, we Finns want to play a part in developing better information societies for people in Europe and around the world.

Aatto J. Repo
Managing Director
TIEKE

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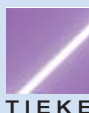
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Centre has a key networking role as a neutral and non-profit organisation in promoting the efforts of its members, within the public and private sectors alike, with an ultimate goal to create viable tools and expertise for use in the information society.

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A portrait of Mr. Matti Vanhanen, Prime Minister of Finland, sitting in a dark suit and glasses, smiling. He is in a room with green walls and a lamp. The text is overlaid on the bottom left of the image.

“Innovation-driven activities, competitiveness and information society related issues are featured strongly in events planned for Finland’s EU presidency.”

Mr Matti Vanhanen
Prime Minister of Finland
President of the European Council (1.7.-31.12.2006)
Chairman of the Information Society Policy Programme’s
Ministerial Group, the Information Society Council and the
Science and Technology Policy Council

Towards a More Innovative and Competitive Europe

Matti Vanhanen, Prime Minister of Finland, Photo: Lehtikuva Oy/Prime Minister's Office

Finland will hold the Presidency of the European Union between 1 July and 31 December 2006. During our Presidency, we wish to emphasise that public confidence in the EU can only be improved through concrete achievements in areas where Union-level action clearly outperforms action taken by individual Member States alone. Finland will concentrate on the challenges now facing Europe, such as globalisation, improving competitiveness, population ageing, climate change and security. Finland will also promote the development of a broad-based innovation policy, drawing on the recommendations made in **Esko Aho's** innovation report (Hampton Court report) as one source of ideas.

In the development of EU innovation policy we want to adopt a broader approach encompassing demand for innovation. Notwithstanding the importance of joint and national measures to increase research and development funding and to put it to more effective use, innovation policy cannot make a real difference unless measures are taken to develop the markets that encourage innovation and generate new demand for it. Such measures include standards, public procurement, steps to make markets function more effectively, greater mobility of research resources and closer cooperation between universities, business and public sector as a whole.

In Finland, systematic research is developed largely through guidelines given by the Science and Technology Policy Council which works to assist the Government and various ministries. Led by the Prime Minister, the Council handles key issues related to science, technology and innovation policy. The goal is to enhance Finland's position in various areas through investments in high-quality education, research and innovation-oriented activities. Key policy guidelines are prioritisation, national and international profilisation and selective, forward-looking decision making.

On an international scale, Finnish R&D funding is at a high level. In 2005, the share of R&D funding was 3.52 per cent of GDP. By comparison, the European Council at Barcelona in 2002 set a target of directing 3 per cent of GDP for R&D in EU Member States by 2010. However, implementation of research results cannot be guaranteed solely by increasing R&D funding. It is also important to ensure proper allocation of R&D funds and to avoid overlapping work. R&D investments must also be directed especially to areas which are most important in terms of national economy, social development and public wellbeing. This applies equally to Finland and the entire EU.

The Science and Technology Policy Council is currently

overseeing the preparation of a national strategy for the creation and nurturing of internationally competitive science and technology clusters and centres of expertise. On the whole, R&D investments focus increasingly on the utilisation of information and knowledge and, among other things, on service innovations.

Information society development is one of the key strategic goals of the current Government. For this purpose, in 2003, the Government started a horizontal Information Society Policy Programme, and appointed a broad-based National Information Society Council, both led by the Prime Minister. During the past three years, the programme has focused on implementing key information society measures, establishing a dialogue and fostering cooperation between various stakeholders. Examples of the programme's achievements include structural renewal of public administration IT management, creating of a national electronic patient record, and bringing broadband connections within reach of all citizens.

As the Government's term of office approaches its end, a National Information Society Strategy is being prepared under the Government Information Society Programme. Aiming at the year 2015, the strategy focuses particularly on the development of service provision, skills and innovation-driven activities, with the goal of making Finland more innovative, human-oriented and competitive.

Innovation-driven activities, competitiveness and information society issues are featured strongly in events planned for Finland's EU Presidency. In September, through the EU's i2010 programme, we will examine an information society related theme of the new everyday life (ubiquitous society). In October, we will have the seminar Networked Business and Government - Something Real for the Lisbon Strategy which examines concrete examples to boost European competitiveness. In November, we will launch a new European innovation system - European Network of Living Labs; while in the same week, a large group of experts will gather in Finland for the IST 2006 conference.

Strengthening European competitiveness through investments in R&D and broad utilisation of information and communications technology is our common challenge. Increased cooperation is a key priority for the development of the information society set by the Ministerial Group of the Finnish Government Information Society Programme. Such cooperation is needed at the national level as well as the EU level and world-wide. ■

From Information Society to Innovation Society

Super Productivity in Working Life

Markku Markkula, Chairman of the Board of TIEKE

Productivity and the resulting welfare cannot be increased by simply trimming costs; new, improved products and services have to be created, and their creation processes must be enhanced. The development of ICT facilitates the worldwide marketing and distribution of services. Society is changing from industrial structures to dynamic value networks, and this has an impact on the activities and structures of private and public sector organisations. Benchmarking successful organisations is a widely used methodology in strategical development. However, we should recognise the success factors of the ongoing global development also as nations.

This article is based on the report "ICT and Productivity in Finland", published in the spring of 2006 by the Information Society Council. The author of this article Markku Markkula, the chairman of the board of TIEKE and the director of TKK Dipoli, was the process manager and the main author of the report. His experience includes, also, eight years as a Member of Parliament and a substantial number of international tasks.

The report describes how new applications and uses of ICT increase society's productivity and vitality. The impact of ICT on productivity is examined from various viewpoints: that of citizens, labour market, education, research, product development, social welfare and public health services. A great deal of attention is also paid to the creation of e-business content, the development of e-governance, and in general the opportunities offered by communications and a network which is available to all citizens.

In the report, the impact of ICT on productivity is examined from global, national, regional, communal and individual viewpoints. Special focus is given to the development of working life.

The report can be found at www.tietoyhteiskunta.fi

In improving productivity it is also important that work communities, business sectors, and Finland itself make the right choices. A crucial basis for success is that there is a good awareness of customers' needs and how these needs might change, as well as of the situation of other producers in the same field.

Taking possession of a field of action implies a need for clustering, and for creating a work culture and setting targets within the cluster. They are the prerequisites for productive development of cooperation between value networks. In order to succeed, every community must manage its own activities and the value chains and networks of its activity environment. Through these the variety of the correlations and influences between the values and benefits can be understood in times characterised by rapid changes.

Value networks enable the documentation and development of joint processes, and the high utilisation rate of resources and action on the frontier of change.

The 3S-Experience: Silicon Valley, Singapore and Suomi

In a report provided by Tekes (the Finnish Funding Agency for Technology and Innovation) in 2004 on the global information society – Benchmarking Finland, Silicon Valley and Singapore – Dr. **Pekka Himanen** emphasised that the core of Finland's model (Finland = Suomi) is a virtuous circle binding a dynamic knowledge economy and the welfare state. The welfare state can be financed thanks to economic growth.

According to the report the key concepts are a networked organisation and growth in productivity based on innovations. They form the crux of the knowledge economy. Research has shown that in recent years technological innovation coupled with a



Markku Markkula

the chairman of the board of TIEKE and the director of TKK Dipoli, was the process manager and the main author of the report "ICT and Productivity in Finland". His experience includes, also, eight years as a Member of Parliament and several international roles.

networked organisation has been increasingly important as a basis for growth. The welfare state makes development more socially equitable and builds confidence in it. A public, free, high-quality education system giving everyone similar chances to develop their talents is very important.

In deepening this analysis, we need to stress the influences of globalisation. This means making choices: both in companies and by nations. In other words, you need to know what you want and to have the capability and courage to make also difficult decisions.

Finland's vision emphasises innovativeness and the ability to act at the forefront of development while making the right choices. Necessary prerequisites for this will be created by implementing the Parliament's decision of "making our country the world's best innovative environment".

Heavy investments and structural changes bringing the desired results on a long term are, however, not easy to make. In Finland we have established many organizational instruments to encourage innovativeness at the highest decision making level of the society. At the Parliament level, we have the Committee for the Future, which consists of 17 Members of Parliament. Two other important organs are the Science and Technology Policy Council and the Information Society Council, both chaired by the Prime Minister, which have as members, besides several ministers, representatives of academia, industry and labour unions. A unique feature of the working habits of these organs is that they operate as networks of knowledge creation themselves.

More Focus on Knowledge Capital in Working Life

Knowledge capital, needed for high productivity and sustainable success, is best created in communities and societies which, in addition to rationality, also emphasise values and emotional intelligence.

New work and business cultures, along with ICT-driven working methods, have become a fundamental development trend for increasing productivity and for making profitable business. As a consequence of internationalisation, activities are constructed as value chains and value networks, and many support and other activities are outsourced.

Partly Finland has succeeded exceedingly well in the international competition for jobs. Especially in the telecommunication cluster Finnish expertise is world class and job productivity is extremely good and has grown quickly. The situation is mostly good in the traditional process industry, and heavy metal industry which have modernised their activities by integrating the newest multidisciplinary technology into their processes.

According to several studies, ICT increases productivity especially when organisation and business processes are modernised at the same time. Finland's strengths have been goal-oriented technological development and its process industry, and the industrial production of technical appliances. Finland is a world leader in the amount and quality of input that increases competitiveness; in output there is room for improvement. We Finns have been strong in developing new technology, but weaker as its exploiters.

Business models and value networks have changed rapidly. Alongside mass production the demand for individualised products and services will drive

decentralised and small-scale production, which will increasingly often be integrated into the global processes of mass production. Good productivity is of primary importance, but it is no longer measurable with traditional methods and concepts. Decisive for the economic foundations of national success and well-being is the intellectual capital of citizens, work communities and society and its continuous capacity for renewal.

In the development of productivity and vitality, the following issues are crucial on personal, community, local and national level:

1. Goal-oriented implementation of the principles of a learning organisation;
2. Creation of new knowledge and know-how based on effective knowledge management;
3. Goal-oriented use of the principles of self-renewal;
4. Goal-oriented use of possibilities offered by information and communication technology.

Vitality from Working together and Learning together

In Towards a Networked Finland, a report published in the spring of 2005 by the Information Society Council, the conclusion was that the key success factors are the knowledge capital of work communities, influenced by systematic professional development, and self-renewal capacity of communities and individuals together with dynamic management of processes. Additionally, it must be ensured that in the workplace the best possible knowledge of communication technology is used efficiently and economically, and in such a way that the prerequisites for high productivity are met in all central areas.

The change in work culture facilitates new business structures and methods. The

Finland should become the information society's laboratory, a spiritual development centre of creativity. It would generate new, versatile, ICT-based services, concepts and products which would find globally widespread applications, especially in the development areas of the employment sector, education, well-being, culture and administration, on international markets.

Changes in progress in working life and productivity. The ideas generated during the compilation of the report can be shaped into a direction for development as shown in the table below. Substantial improvements can be achieved with the help of mental processes and ICT. The aim of radically improving productivity can be met especially with the joint influence of the factors portrayed in the table. Source: Markku Markkula, TKK Dipoli 2005.

Input	Present state	Target state
Knowledge	General knowledge in common use	Goal-oriented competence development
Nature of work	Being at work	Goal-oriented working seen as a process
Work culture	Acting too much alone	Goal-oriented working and learning together
Information management	Information obtained for specific needs case by case	Actors' systematic command of knowledge management
Knowledge creation	Based on researcher's interests	Use of multidisciplinary developer networks
Structural thinking	Focus on own staff	Focus on own core processes and relational capital

digitisation of information and the rich use of information networks and linked appliances enable change towards a new communality and a networked, global working culture. Knowledge management is a fundamental part of every work community. The success of individuals and the work community is based on effective knowledge management and long-term increase of professional expertise.

The whole formed of the success factors is of crucial importance. To improve Finland's competitiveness and productivity the Information Society Council suggests

that developing work culture is chosen as the priority target. In this the focus areas are:

1. Work community's culture of working together;
2. Efficient utilisation of ICT and know-how that influences productivity;
3. Work processes and process methods;
4. Innovativeness, self-renewal and the capacity of organisations and their management to foresee.

Super Productivity and Change Agents

The Learning Café Workshops, which were used as a methodology throughout the process of writing the report, shared an emphasis on the meaning of attitudes that promote creativity and the will to change. Decision-makers are expected to be able to make decisions which are difficult but indispensable for the future.

Agents of change and productivity commandos were presented in the workshops as doers for the desired development. Finland should become the information society's laboratory, a spiritual development centre of creativity. It would generate new, versatile, ICT-based services, concepts, products and applications which could spread globally, especially in the development areas of the employment sector, education, well-being, culture and administration.

The workshops' message to decision-makers was that productivity and psychological well-being must be integrated. Values should be founded on a positive attitude: the desire to know and to succeed, sociality, the acceptance of different cultures and growing tolerance. The competitive instinct should be turned into a resource, as Finns want to excel both as individuals and as a nation - and not only in sports and music.

Sustainable development demands growth in productivity on a broader front. It is Finland's goal as a nation that the activities of individuals and communities - particularly in terms of working life - should be characterised by increasing vitality. Crucial for the vitality of Finland is that the possibilities afforded by ICT in improving productivity are used in a goal-oriented fashion. We have the knowledge to generate the necessary super productivity. ■



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Priorities of the Finnish EU Presidency in the Field of Electronic Communications

Susanna Huovinen, Minister of Transport and Communications, Finland

Finland will make effort to ensure that Information and Communication Technologies play a key role in the context of the revised Lisbon strategy. In this respect we will work to ascertain the successful start of the “i2010 - a European Information Society for Growth and Employment” initiative and to facilitate its effective implementation.

In the communications field, the main political priority of the Finnish Presidency will be information security. We will give particular attention to enhancing the security and interoperability of electronic communications and services, in order to strengthen the internal market and European citizenship. To this end we will work to strengthen network and information security by considering a communication expected to be submitted by the Commission.

Finland has been very active in the field of information security. In 2003, the Finnish Government adopted a resolution on the National Information Security Strategy. On the European level Finland aims to enhance information security and user confidence, in order to promote the utilization of information and communication technologies in the EU.

In September 2006, the Ministry of Transport and Communications will organise in co-operation with the European Commission and the European Network and Information Security Agency, ENISA, an European Information Society Conference. The theme of the conference will be “i2010 – Towards a Ubiquitous European Information Society”. The key topics to be discussed will include trust and security in a changing technical environment, the

intelligent car and intelligent transport systems, as well as consumer concerns.

During the Finnish Presidency, issues to be dealt with in the Council meeting of the Telecommunications ministers will include the proposal for a European Parliament and Council Regulation on international roaming tariffs. I welcome the Commission’s initiative to tackle the challenges of international roaming for the benefit of EU citizens. At the moment the roaming tariffs are too high, which puts the consumers in a very unfavourable position. Depending on the precise content of the proposal as well as the reactions in the Council, we are hoping that a first reading agreement of the proposal could be achieved with the European Parliament during the Finnish Presidency.


A legal review of the European communications legislation is in the making. The European Commission is preparing a communication on this issue and might publish legal proposals before the end of 2006. The aim is to reduce existing regulations within the confines allowed by the development of the industry and EU legislation. Because it is likely that the Commission’s proposals will not be dealt with before the German presidency, Finland is ready to organise an informal discussion on this item before the Council meeting of the Telecommunications ministers.

In relation to the legal review of the communications legislation, the common European spectrum policy will also be on the agenda during 2006. Finland fully shares the view that Europe needs a new and flexible spectrum allocation model. However, there is a broad consensus in

Finland that a market based approach in the management of spectra is not necessarily the most effective way forward. A market based approach might lead to the concentration of frequencies into the hands of a small number of licence holders, which could weaken the supply and diversity of services and obstruct the emergence of new markets. At the moment there are no initiatives coming from the Commission and therefore this issue is not on the official agenda during our Presidency term.

Also the follow-up of the World Summit on the Information Society, with special attention to the issue of Internet Governance, and the Commission’s proposal for the revision of the Postal Services Directive which is to be submitted by the end of 2006, will potentially be on our agenda.

The revision of the “Television without Frontiers” Directive (audiovisual media services directive) is to be dealt with in the meeting of the Education, Youth and Culture Council. In my view, the proposal to revise the Television without Frontiers Directive is a good basis for our discussions, as it strives to answer those challenges that have arisen in the broadcasting sector in recent years. The revision of the Directive is of great interest to us, not only because the regulation needs to be modernised but also as the discussions on the revision will evidently continue in the Council and within the Parliament during our Presidency. In this respect Finland is committed to working hard on this dossier and our objective for the Council is to accept a general approach on the Directive. ■



“A market based approach might lead to the concentration of frequencies into the hands of a small number of licence holders.”

Susanna Huovinen
Minister of Transport and Communications Finland

World's Largest Broadband Network

Seppo Toivonen, Managing Director, Finnet Association



In the Land of Lakes telecommunication presents many challenges. In Southern Savo, broadband access is guaranteed with WiMAX technology.

Mikkeli Telephone Company and Savonlinna Telephone Company, both members of the Finnet Group, are constructing a WiMAX network offering fast, wireless broadband connections in the region of Southern Savo. WiMAX stands for Worldwide Interoperability for Microwave Access. By the summer the network will cover all of Southern Savo, with local residents as well as tens of thousands of summer visitors able to enjoy broadband services. As an indication of the project's pioneering nature, the network saw the delivery of the world's first WiMAX customer equipment.

Around 96 percent of Finnish households already have access to broadband service. Problem areas are sparsely settled country districts and remotely located summer homes. This is where WiMAX comes in. In addition to Southern Savo, Finnet companies have constructed WiMAX connections in areas including Kainuu, Ostrobothnia, Pirkanmaa and far Northern Finland.

World's Largest

WiMAX is not new to Southern Savo. Trial WiMAX service based on WDSL technology has been offered since 2004 in the municipalities of Rantasalmi, Juva, Puumala and Sulkava. Now genuine WiMAX will be extended to all of the other municipalities in Southern Savo.

WiMAX brings broadband services to sparsely settled areas and remotely located summer cottages. Such locations have been out of the reach of ADSL, owing to long wire spans or lack of copper networks. "By this summer the WiMAX network will cover 96 percent of Southern Savo, with locals as well as 43.000 summer residents able to access broadband services. We are constructing one of the world's largest WiMAX networks," says Savonlinna

FINNET GROUP

Finnet is a Finnish telecommunications group, which offers its clients local and national voice, data and digital television services. The Group includes 35 telephone companies, Finnet Ltd with its subsidiaries, as well as Finnet Association.

In 2005 the Finnet Group's turnover was 1043 million euros.



“The role of forerunner is not reserved for big companies; any company in the Group can be a forerunner and coordinate joint activities.”

Reijo Tuomela,
Managing Director of Savonlinna Telephone Company

Telephone Co's Network Manager **Ritva Partanen**.

In Southern Savo WiMAX is also seen to bring new possibilities in telecommuting. “With WiMAX people will have a chance to spend more time at their summer homes and work from there with their computers. This will help secure services in sparsely settled areas,” says Department Manager **Mauri Valkonen** from Mikkeli Telephone Co.

2.4 Million Euro Project

By July, Savonlinna Telephone will construct more than 40 base stations in Southern Savo and North Karelia. The company expects 3.000–4.000 customers to connect to its WiMAX network, while Mikkeli Telephone has a target of 2.000–3.000 WiMAX customers.

Southern Savonians are particularly pleased with their collaboration with Intel. For 35 years Intel has been developing technology enabling the incursion of PCs and the Internet in nearly every home. Intel develops and manufactures network and communication solutions, chips, motherboards, systems and software for PCs and the Internet. “Mikkeli and Savonlinna aim to be Finnish market leaders in WiMAX services. Intel wants to be a part of this process,” says **Leif Persson**, Intel's Director for the Nordic Countries.

WiMAX networks are not cheap to build. If a base station can be located in the company's own mast, the cost per mast comes to around 10.000 euros, says Ritva Partanen. If the mast has to be rented, the cost is double. For Southern Savo's WiMAX network, the companies have reserved 2.4 million euros.

Forerunner Role also Suits Small Operator

“In the Finnet Group, acquiring know-how follows a set, proven tradition. As different operating companies acquire knowledge and experiences, they share these with other members of the Group. In this way we can always work on a best-practice basis. It is important to note that the role of forerunner is not reserved for big companies; any company in the Group can be a forerunner and coordinate joint activities,” says **Reijo Tuomela**, Managing Director of Savonlinna Telephone Co.

According to Reijo Tuomela, many people in the regions of Savonlinna and Mikkeli work in their summer cottages using the Internet. The area is also a popular destination for international tourists. For both tourists and telecommuters, efficient telecommunications is a must. “Already some years ago, we started to study how best to satisfy these kinds of customer requirements. As an added challenge, we wanted to create genuine competition outside our traditional operating area. We took a calculated risk and decided to build a totally new type of fast, wireless broadband network,” says Reijo Tuomela. “Our decision was clear and simple. We entered a new business arena.”

Reijo Tuomela says that the new WiMAX network has attracted interest around the world, with experts from many countries visiting Mikkeli and Savonlinna to see how WiMAX works in practice. “At the moment our network is the biggest in the world, measured in terms of actual end users.”

The case of Savonlinna and Mikkeli has also brought other Finnet companies on board. “The development of Eastern Finland as a whole is currently being pondered. We have reason to believe that,

through careful, patient efforts, we can keep the region viable. We are playing a part in making the information society a reality in the sparsely settled areas of Finland,” says Reijo Tuomela.

Casting Doubts Aside

Ruoke Holiday Village sits on a promontory of Lake Puruvesi, some 12 kilometres from the community of Kesälahti. Around 350 kilometres from Helsinki, Ruoke comprises 20 hectares of beautifully maintained, pine-covered landscape, capped off with 600 metres of beach. Accommodation is in comfortable, fully equipped cabins both large and small.

Ruoke Holiday Village offers WiMAX for use by its customers. The owner, **Mika Laukkanen**, is happy with both the technology and how it works. “Broadband connections are very important to us, as our customers can now stay here longer and work in their cabins. In time we intend to equip our top-range cabins with all possible devices that make it easier to telecommute,” he says.

Thanks to WiMAX, the residents of Ruoke Holiday Village now have access to a wide range of broadband services.

Paavo Barck says he is one of many who, living far from centres of population, have always had to wait for roads, electricity, telephones and broadband services. “When it comes to broadband, I was initially a Doubting Thomas, but now I've come to see the light. In telecommunication, proper does not have to mean copper.”

For Paavo Barck, even installing the equipment was easy. “If you can climb on the roof, you can install the equipment. New technology like this opens up brand new possibilities for the countryside,” says Paavo Barck, for whom the nearest town is 25 kilometres away. ■

World Record Speed in Broadband Development

Reijo Svento, Managing Director, FiCom

“The success of the Finnish broadband strategy shows how concentrated input and proper prioritisation can lead to great results, even within a short time frame.”



Reijo Svento,
Managing Director
Finnish Federation
for Communication
and Teleinformatics, FiCom

Finland has advanced at a world record pace on the growth in the number of broadband connections. All targets, however challenging, have been met before deadline. By the end of 2005 Finland already saw 1.2 million broadband connections.

In the national strategy ratified for 2004–2007, the interim goal was to attain 1 million broadband connections by the end of 2005. Most of these had to feature a speed of no less than 2 Mbit/s. Another goal was to make Finland one of the European leaders in the use and availability of high-speed connections.

To meet the goals, Finland initiated a wide-ranging programme consisting of 59 different measures. Both the public sector and private companies participated widely in the programme, with each province drawing up its own regional broadband strategy. Timetables and clear responsibilities were set for each measure, and a special broadband strategy work group monitored the programme's progress.

Goals Met before Deadline

The goals set for the programme were met even sooner than the original, challenging deadlines stipulated. The one-millionth connection was made already in the summer of 2005, and by the end of the year Finland had 1.2 million broadband connections, with a great number faster than 2 Mbit/s.

Wide regional coverage, too, was reached before the due date. The goal was to enable more than 95

percent of households to access broadband by the end of 2005, and this goal was met already in September. In particular, the development in Eastern and Northern Finland, as well as the geographically problematic archipelago areas, was supported by new, wireless technologies. By the end of 2005, 47 percent of all Finnish households had acquired a broadband connection.

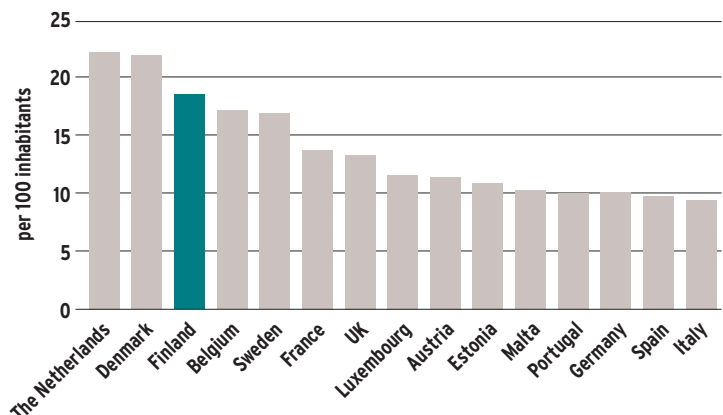
International Leader

On a European scale, Finland is one of the leaders in the introduction of broadband services. Statistics published by the EU Commission in the summer of 2005 show Finland to rank third, just behind Denmark and Belgium. Finland's penetration rate was, for example, greater than Sweden's. Taking into account the country's large size and sparse population, this achievement is nothing short of excellent.

In Finland between June 2004 and June 2005, the growth rate of broadband connections was the fastest among all the OECD countries. In that period, the number of broadband connections per one hundred inhabitants increased by almost eight units.

The success of the Finnish broadband strategy shows how concentrated input and proper prioritisation can lead to great results, even within a short time frame. Thanks to fast, easy to use broadband connections, ordinary citizens as well as companies can access a wide range of versatile services that make life easier in the information society. ■

ECTA Broadband Scorecard,
end of July 2005. On the average,
broadband penetration per 100
inhabitants was 10,5
in EU countries.



Laptop computers and hand-held micro PCs are familiar to most people, and now latest model mobile phones, too, enable access to wireless local area networks (WLANs). The city of Turku, through its SparkNet and OpenSpark solutions, is today Finland's foremost deployer of WLANs, which also cater for low-cost Internet telephony.

Turku Leads the Wireless Revolution

Riikka Erkko, Communications Officer, Turku Science Park Ltd

SparkNet, which provides WLAN service in and around Turku, boasts 900 base stations and its sister network, OpenSpark has a further 500. Together these two short-range wireless networks offer access to the Internet almost anywhere in the Turku metropolitan area. At the same time, mobile phones like the new Nokia E-61 enable calls via the Internet; the service is hosted locally by Suomen Puhelin Ltd.

Calling Via the Internet

Suomen Puhelin Ltd, founded in the autumn of 2004, began collaboration with Nokia Corp. when new generation mobile phones were being tested. Today, Nokia's E-Series phones convert readily into Internet telephones. Subscribers receive the required configurations in their phones by text message. After keying in their user ID and password, they are able to use their E-Series phones for either conventional calls or Internet (IP) calls. Mobile IP calls can be made in any location covered by a WLAN network.

"In the future, Phonet connections can most likely be configured already in the factory, making the phones even easier to deploy," says **Ari Varjonen**, Managing Director of Suomen Puhelin Ltd.

IP telephony is extremely cost-competitive. The cost of calls to the fixed network is very low, while calls to mobile networks are also cheap. Calls made to another Suomen Puhelin connection or to a Phonet IP phone are completely free.

Real Network of Collaboration

Turku's SparkNet network is Finland's largest in terms of both base stations and users. SparkNet was cofounded by the University of Turku, Åbo Akademi University, Turku University of Applied Sciences, Turku School of Economics and Business Administration, ICT Turku Ltd and MP-MasterPlanet Ltd. The network is geared to cover the needs of cities, enterprises and other organisations, as well as home users.

OpenSpark revolves around the concept of sharing network connections. Membership in the so-called OpenSpark community is granted to anyone who acquires a wireless base station and allows other members of the community to freely utilise the base station network. In return, the new member is allowed free use of networks established by other members of the community.

"The OpenSpark concept is a value added service for broadband users, which also offers wireless connections



Ari Varjonen, Managing Director of Suomen Puhelin Ltd, making an Internet call with a Nokia mobile phone, via a Phonet connection and OpenSpark.

outside your home," says **Matti Kiviö**, founder of the OpenSpark community and Managing Director of MP-MasterPlanet Ltd.

OpenSpark is, at the moment, the only legitimate way for home users to share their own WLAN connections. Also, more and more operators now allow OpenSpark base stations to be joined to their subscriber connections.

In Turku, wireless use is set to grow further, as OpenSpark customers can now also acquire a Phonet connection, offering them Internet calls via Suomen Puhelin Ltd.

Services, Not Just Technology

As a subsidiary of Turku Science Park Ltd, ICT Turku Ltd has the task of driving the growth of the ICT cluster in Southwest Finland. As part of this work, the company has actively brought together various agents to create an open network with its related services. Technological know-how has to be converted into commercially viable products wanted and needed by the end-users.

"Wirelessness brings all digital IP services to everyday life, making things easier for people," says **Jaakko Kuosmanen**, Managing Director of ICT Turku Ltd. ■



Live Broadcast Mobile TV

Global Pilots Reveal a Strong Demand for Broadcast Mobile TV services

Results from pilots of broadcast mobile TV services in Finland, the UK, Spain and France reveal that people are ready for such services. Each of the pilots involved a broad spectrum of companies, encompassing broadcasters, mobile operators, broadcast network providers and Nokia.

Live digital TV content was broadcast over DVB-H (Digital Video Broadcasting – Handheld) networks to Nokia 7710 smartphones. Unlike “streamed” mobile TV content, which is sent to handsets via 3G “one-to-one” delivery), DVB-H broadcasts a signal to users’ mobile phones (“one-to-many” delivery). The Nokia N92, a DVB-H enabled device for commercial use, has a full set of features for the consumption of mobile TV services, like an interactive

Electronic Service Guide, which makes it easy for mobile viewers to plan what they want to watch.

According to Informa, a research firm, there will be more than 50 million DVB-H devices sold globally by 2010.

Broadcasting to People on the Move

As well as delivering digital broadcast-quality audio and video to audiences on the move, DVB-H also complements operators’ cellular networks. This gives viewers the opportunity to interact with mobile TV programs using interactive services such as voting and chatting.

Participants in the pilots identified certain criteria as being essential for a quality mobile TV service: easy, intuitive services; good technical functionality and reliability; and suitable content for short-period viewing. It was also important that the TV applications did not compromise the functionality of the mobile phone. The most popular pricing model to emerge was a monthly subscription for a package of channels, with participants prepared to pay up to €10 a month for mobile TV services.

Viewers Feel at Home with Broadcast Mobile TV

The pilots also revealed new prime times. In the UK, lunchtime mobile TV viewing was more popular than the normal TV pattern. In France, the early morning, lunchtime and mid-evening represented the periods of highest use. The most popular content was news, sports, music, soaps and documentaries. Interactivity was also regarded as an important functionality.

An interesting aspect of all the pilots was that many users watched mobile TV at home. Almost half of those taking part in the French and Spanish pilots claimed to mainly watch mobile TV at home.

“We are delighted with the results of these pilots which have involved such a broad spectrum of different companies from the mobile and broadcast industries,” says **Ilkka Raiskinen**, Senior Vice-President of Multi-media Experiences at Nokia. “They demonstrate consumer demand and the business models for viable commercial services.”

Visit www.nokia.com/mobiletv to keep up to date with the fast-moving world of mobile TV. |

Broadcast mobile TV pilots around the world

	Finland	UK	Spain	France
Positive response to mobile TV	58% believe mobile TV services would be popular	83% are satisfied with the service	75% would recommend the service	73% were satisfied with the service
Willingness to pay for mobile TV	41%	76%	55%	68%
Acceptable monthly fee for mobile TV	€10	-	€15	€17
Average daily viewing	5 to 30 minutes of mobile TV per day on average	23 minutes per session with 1 to 2 sessions per day	16 minutes	20 minutes
Peak viewing times	-	Mornings/lunchtime/ early evenings between 7pm and 8pm	While commuting and midday (1pm-2pm) and evening (8pm-10pm)	Morning (9am-10am),
Popular content	Local programs available through Finnish national TV and sporting events	News, soaps, music, documentaries and sports	News, series and music	News, music entertainment, sport, documentaries and films
Number of participants	500	375	500	500
Conducted by	Nokia, Digita, Elisa, Nelonen, Sonera, YLE	02, Arquiva, Nokia	Abertis Telecom, Nokia, Telefonica Moviles	CANAL+ Group, Nokia, SFR, towerCast
Location	Helsinki	Oxford	Madrid and Barcelona	Paris
Dates	March-June 2005	September 2005-March 2006	September 2005-February 2006	September 2005-June 2006

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Information Society for All

- The Finnish Model for Building the Information Society

Ville-Veikko Ahonen & Katrina Harjuhahto-Madetoja, The Finnish Information Society Programme

The Finnish Government has afforded the development of the information society a high priority and, in 2003, it launched an extensive four-year Information Society Programme. The programme is led by the Prime Minister, Mr. **Matti Vanhanen**. It is a combined effort involving all ministries and a wide range of actors throughout the society. Altogether, the programme covers almost 150 different implementation processes. The Programme is steered by a five-member Ministerial Group and followed by a widely based Information Society Council which consists of ministers, agencies, enterprises, trade unions, universities and third-sector organizations.

Technology Serving People

The mission of the programme is Information Society for All. This means that every citizen should have the possibility to utilise information society services regardless of their place of residence or social status. Furthermore, the programme aims to engender a high level of trust in the electronic services available. It should also result in increased productivity and reengineered processes within the public administration, and foster competitiveness of Finnish enterprises.

Finland has long enjoyed an edge in technological development. However, the Information Society Programme is not merely an information technology policy for Finland but rather a part of a wider societal policy. In the near future, Finland has to find ways to address such challenges as population ageing and the ensuing increased need for social and health care services. In addition, Finland has to cope in tightening global markets and be well equipped to face growing competition. A better use of ICT can help to tackle the aforementioned issues.



One of the measures of the Finnish Information Society Programme is to prepare a new National Information Society Strategy for the year 2015. The Programme is led by the Prime Minister of Finland, Mr. Matti Vanhanen, and managed by Programme Director, Ms. Katrina Harjuhahto-Madetoja.

Fresh Impetus to the Welfare State

Information society development has been rapid in Finland. The use of the Internet, for instance, has grown so that 75% of all Finns have accessed the web over the last three months. Broadband connections are available to more than 95% of the population. At the same time, online public services in central administration have risen by 31% per year and according to Accenture survey (06/2006) Finns use public online services most in the world. Purchasing via the Internet has also grown significantly. Finland has scored high marks in recent international comparisons. However, a lot of work still needs to be done particularly in the fields of eDemocracy, teleworking and eLearning. ICT can also be a major factor in boosting public sector productivity and its service provision. We are convinced that information society development will provide fresh impetus and infinite opportunities to the Finnish and the Nordic welfare state as a whole – a model admired throughout the world.

Shaping the Future - Preparation of a New National Information Society Strategy Under Way

The Information Society Programme will end in spring 2007. However, the work to build an information and knowledge society continues. One of the last measures of the Programme is to prepare a National Information Society Strategy for the year 2015.

This new strategy will describe the changes in the national and international operating environment and it will provide ground for the future development of the Finnish information society. One of the strategy's aims is also to contribute for the preparation of the next cabinet's Government programme.

The preparation of the strategy will involve key decision-makers and actors within the Finnish information society. On the basis of a background inquiry for interest groups, the aim is to create an innovative, human centric and competitive Finland. |

State ICT Seeks a New Direction

Olli-Pekka Rissanen, Special Adviser, The Ministry of Finance

In order to evaluate the ongoing reform of state information and communications technology, we have to take a quick look at the past. ICT development in Finnish state administration began from various points, but it was directed centrally by the Ministry of Finance. As ICT expanded in the 1980's, centralised governance had to be relaxed in stages, for example in the acquisition of personal workstations. Tight control would have been much too arduous to implement, and instead of individual directives, guidelines were now given on what type workstations should be and from where they should be acquired.

In the early 1990's Finland was in the middle of a deep economic depression and fiscal crisis. It was decided to speed up the introduction of results-based management, while decentralisation of the public sector also gathered pace. These reforms were demanding at every level but most state agencies welcomed them with open arms, as now they would be able to allocate their own funds more independently. State agencies obtained almost total control over their own IT systems.

In Hindsight

Looking back, the decentralisation can be assessed from various viewpoints. On the whole, the results have been good. State agencies have become more efficient and, in the case of IT systems, they have been able to acquire solutions that best meet their particular needs. Now, the intention is not to abolish results-based management, but to move towards more centralised solutions. These will, to some extent, reduce IT administrators' decision-making powers, but they will also make their lives easier.

It is now safe to say that the

decentralisation was taken a step too far. Among the results, the Finnish state administration now has hundreds of different systems for financial and personnel management. Of the 120 various agencies and ministries, all have the same directives and guidelines for financial and personnel management. These have not been decentralised. From the viewpoint of state administration as a whole, this multitude of systems is not cost efficient, nor does it make IT administrators happy. The cost of acquisitions has gone up, while know-how, too, has been dispersed around the country. Nor, unfortunately, has it led to a healthy market situation as, owing to the state administration's special characteristics, the market is now dominated by two big players.

Cooperation has, however, been achieved in many areas. In data security, for example, there has been successful collaboration for almost ten years in almost every area. As a result, there is now a wide-ranging set of guidelines covering everything from technical instructions to administrative data security. Collaboration has also taken place both within different agencies, and between them when they have had common goals. As an example, Finland has comprehensive, up-to-date central databases on individuals, enterprises, properties and vehicles. Upkeep of the databases is dispersed between various offices and agencies, and these have a long history of extensive collaboration through a voluntary work group known as the database pool.

The state and local governments have also collaborated vigorously in the development of electronic services. Examples of shared, jointly developed and maintained services, include citizen's portals (suomi.fi, yrittysuomi.fi, etc.), an

electronic forms service (Lomake.fi), a public sector contact directory (JULHA), and a joint model for electronic reporting of company information (TYVI). The shared services have, for the most part, been success stories and the Lomake.fi service supports a number of popular citizen's services, such as crime reporting and search for vacant rental housing.

New Course

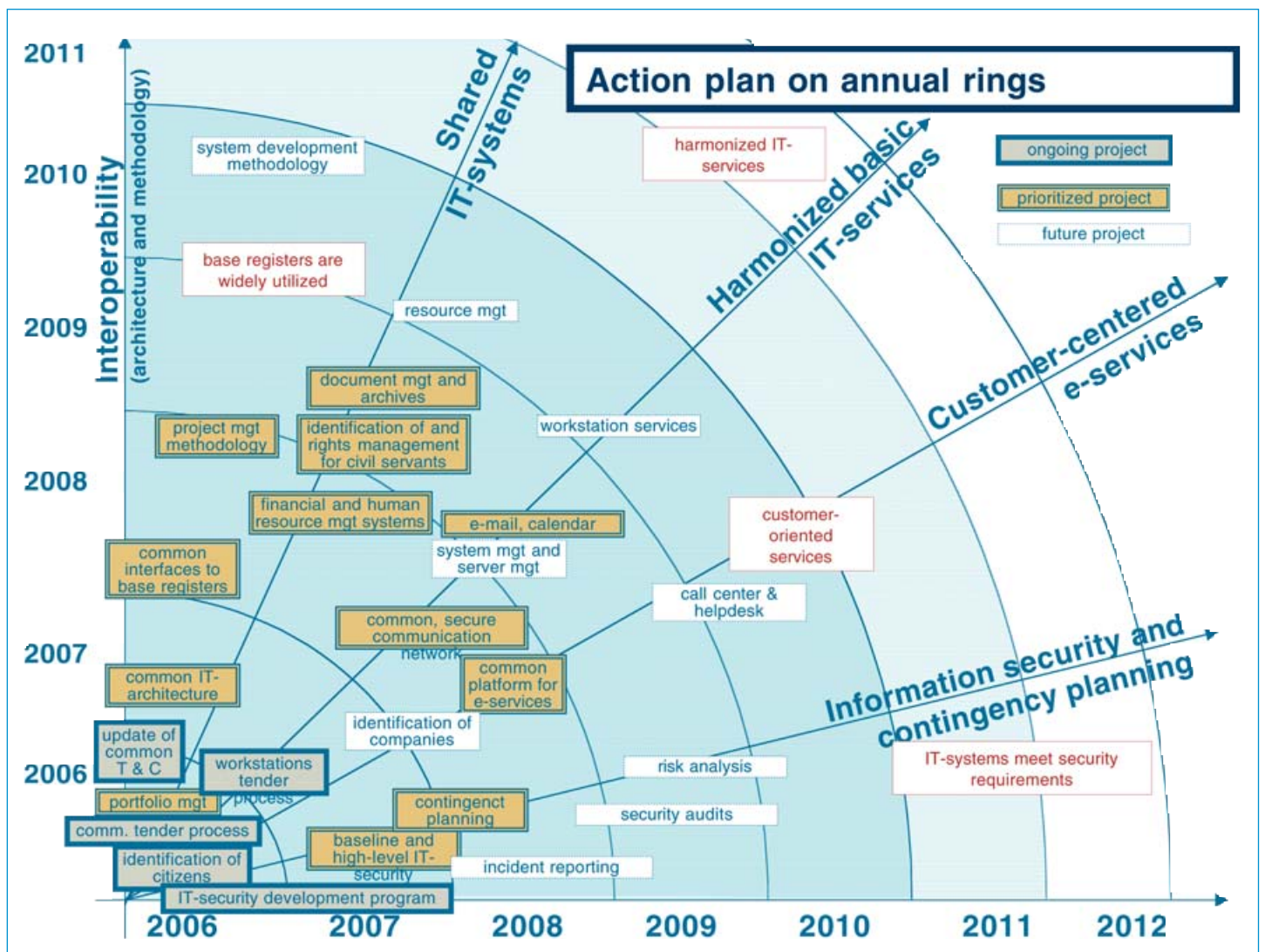
One of the key goals of the new strategy is to change the direction from decentralisation towards a more centralised model. Implementation of the strategy is the responsibility of the State IT Management Unit, which works within the Ministry of Finance.

Results-based management does not allow tight centralisation, so the main method deployed will be information management. Earlier plans called for a special law on state ICT but it proved too difficult to specify which areas should be regulated. Technological progress has been rapid and ICT is now applied in almost all areas of state administration; regulation would only result in red tape and hinder development.

Current legislation allows for a wide range of binding directives on system compatibility and common interfaces. The Finnish Parliament is presently considering an amendment enabling the state's joint acquisitions agency to handle the purchasing of all basic IT systems.

Naturally this kind of wide-ranging reform arouses some opposition and doubts, but many also see the benefits and possibilities it offers. Most data administrators would be relieved to be able to lean on readily negotiated solutions for basic IT technology, and to concentrate more on developing their own core

One of the key goals of the new strategy is to change the direction from decentralisation towards a more centralised model. Implementation of the strategy is the responsibility of the State IT Management Unit, which works within the Ministry of Finance.



operations. As the systems supporting core operations grow older and operations grow more complex, large development projects are still needed.

The shift towards more centralised solutions does not mean that ministries and state agencies will lose their influence. Obviously there will be a reduction in their ability to choose specific products, but all development work will be carried out in

cooperation. The State IT Management Unit is quite small, nor are there plans for its considerable expansion, and all projects rely on expertise gathered from state administration as a whole. Actual specification work is carried out in workgroups, which strive to gather the best possible expertise from the various state agencies. The role of the State IT Management Unit is to steer the

workgroups and ensure that their decisions are also implemented.

Last Straw

The future will tell whether information management and present legislation will be sufficient, or if a special law on state ICT is needed. There also remains another strong steering mechanism: budget control. **I**

Large, Challenging Projects in Information and Communications Technology

Kaj Nordgren, Communications Manager, Tekes – The Finnish Funding Agency for Technology and Innovation

The target of technology programmes and projects funded by Tekes – The Finnish Funding Agency for Technology and Innovation is to develop products, services and applications serving both the information society and end users.

Information and communications technology (ICT) is a key driver in changing society and industry. ICT companies account for around ten percent of all business in Finland and for more than half of the country's research and development activities. Innovations and R&D have a huge meaning for companies in the information and communications sector.

Finland has attained a pioneering position as a developer of ICT and is also a leading ICT applier. For Finland the challenge is to ensure this position also in the future. In developing basic technologies the goal must continue to be world-class know-how, and in applying ICT the targets should be increasingly many and varied. Finland's win factors in global competition continue to be skills and specialisation.

The demand for ICT funding has grown in the past year. Proof of the ICT sector's positive development is the increase in ever more extensive and challenging corporate projects. In 2005 Tekes invested 143 million euros in 799 ICT-related R&D projects; corporate clients numbered 447, with 208 of them new Tekes clients.

Electronics is, at the moment, one of Finland's largest export sectors. Communications electronics holds a commanding share, but also important are automation, measuring and hospital technology, with many Finnish companies market leaders in their field.

In telecommunications the fastest growth is in activities related to mobility and broadband, while basic telephony continues to diminish. The service provision sector, too, is expected to grow rapidly.

Software Sector Growing

The software sector has seen steady growth since 2003, with new companies founded constantly. Alongside a vast number of small companies are mid-sized companies that face new challenges through internationalisation.

The games and entertainment industry also continued to grow strongly, with Finnish companies at the forefront of development. The demand for wellbeing technology, especially health technology, continued to grow steadily. Export of these technologies is hampered by internationally varying rules and systems.

Future Business through Technology Programmes

2005 saw the start of three telecommunications technology programmes. GIGA – Converging Networks develops and creates new international business in the field of broadband communications. VAMOS – Value Added Mobile Solutions focuses on the utilisation of wireless technology in sectors like industry, traffic, construction and services. Thirdly, NORDITE plays a unique role in extending Nordic cooperation in telecommunications research work.

The health care technology programme FinnWell also got off to a strong start. One of its central themes is cooperation between projects and funders.

Under development in 2005 was Verso – Vertical Software Solutions, a technology programme aiming at creating new kinds of innovative, market oriented software products and services, together with integrated solutions that can be cloned for international markets. Also under preparation was the technology programme VETO – Control Systems for Modern Production Plants, which focuses on process automation and real-time information systems. All of these new programmes aim at strengthening and renewing Finnish industries.

ICT applications are also developed in several other Tekes' technology programmes.

Company-Driven International Cooperation

As a new form of international cooperation, Finland and Israel started up the FIT programme, which functions along the lines of the company-driven EUREKA model. With success in 2005, the programme is due to continue.

The EUREKA cluster programmes play an important role in international ICT activities. During the year Tekes invested around ten million euros in ICT cluster programmes, most of it in the ITEA and CELTIC cluster projects.

International Space Strategy Unveiled

In 2005 Tekes invested 19 million euros in 18 different space research projects. Tekes coordinates Finland's role in the European Space Administration (ESA) as well as national space technology programmes.

In June the national space strategy 2005–2007 was unveiled. The strategy underlines Finland's support for the European Space Programme, and promotes the competitiveness of Finnish industry. 2005 saw the successful launch of the VenusExpress space explorer. The launch of the Cryosat satellite failed due to a rocket malfunction, but Cryosat will most likely be rebuilt. These spacecraft deploy Finnish technology. ■

TEKES

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.

Further information www.tekes.fi/eng

Any place, any time - mobile technology is a Finnish strength.



The Finnish Software Product Cluster

Irmeli Lamberg, Program Director, Centre of Expertise for Software Product Business, Technopolis Ventures Ltd

The software industry is one of the world's largest and fastest growing business sectors. Its output can be roughly divided into three categories: software products, customized software and embedded software. Software products are traded separately, and not as part of other products. Although the software product business often includes other activities such as installation, training and even customization, software remains the main trading commodity.

The software product industry in Finland has grown rapidly since the 1990s, and nowadays comprises about 1,100 companies. The Finnish software product industry has many of the prerequisites for rapid growth and success: a strong technology base, a skilled workforce and a strong national focus on research.

Software products and services improve the quality, efficiency and profitability of other industries. The software product cluster is a significant embedded element in the value chains and software intensive systems of other industries.

Statistics:

- Software product revenues totaled €1.19 billion in 2004 (growth 21%)
- There were appr. 1 100 software product companies in Finland at the end of 2004
- The sector employs appr. 12.400 software professionals

Source: National Software Industry Survey 2005 (www.swbusiness.fi)

Helsinki Region

The Helsinki region is a dynamic metropolitan region with eight highly regarded universities, six technology parks and the largest technology campus in the Nordic countries. This competitive area ranks the highest in Europe in terms of creativity, knowledge economy, sector productivity performance and economic performance. Over half of the Finnish software product companies are situated in the Helsinki region.

Contact: Centre of Expertise for Software Product Business / Technopolis Ventures Ltd.
www.swbusiness.fi

Jyväskylä Region

Jyväskylä's information and communication technology sector has become a nationwide growth center in Finland. Focus points and expertise in the software business sector include global entrepreneurship, digital media, wireless and internet technology and applications.

Jyväskylä's ICT cluster consists of a true value chain. The University of Jyväskylä and Jyväskylä Polytechnic have a combined total of over 3.000 students majoring in IT. There are more than 150 companies providing jobs for over 3.000 employees, including Nokia, EADS, TeliaSonera, TietoEnator, SysOpenDigia and many others.

Contact: Jyväskylä Science Park
www.jsp.fi

Oulu Region

The technology sector plays an important role in Oulu. Oulu is the largest software cluster in Finland after the Helsinki region with dozens of established companies and with more than a hundred start-ups. Many global vendors have R&D sites in Oulu. Nokia's R&D site in Oulu, one of the world's largest mobile/wireless R&D sites, demonstrates both the competitiveness and critical mass of the region's technology base. CCC, Elektrobit, Nethawk, and Polar Electro, all global leaders in their field, are examples of established companies founded and headquartered in Oulu.

Contact: Oulu Innovation Ltd
www.swforum.net

Satakunta Region

The ICT cluster in the Satakunta region scales from small service-oriented companies to large international players. Strong academic education together with a robust metal and shipbuilding industry in the area has been a catalyst for many new industrial solutions. This has generated a solid foundation for companies operating in sectors such as communication network services, wireless communications, mobile applications or wearable computing. Local SW Forum networking meetings give companies a good chance to seek out new business opportunities and partnerships.

Contact: Prizztech Ltd
www.prizz.fi

Tampere Region

The information and communications technology of the Tampere Region puts a strong emphasis on design, research and product development. Over a third of all degrees achieved in information and electronic technology in Finland are from Tampere University of Technology. The strong ICT expertise provides significant support to the development of the other fields of expertise in the region. Tampere has also strengthened its position as an international centre for new media and games. The most significant characteristics of the around 200 companies in ICT expertise include embedded systems for industrial machinery and close cooperation with companies in the content production field.

Contact: Technology Centre Hermia Ltd
www.hermia.fi

Turku Region

The Turku region's software cluster focuses heavily on R&D which is enhanced by a multi-university campus mainly located in Turku Science Park area. The focal areas of its rapidly growing entrepreneurship activity are software process modelling, digital TV, testing and security solutions. The activities of the Turku region's software cluster are also manifested in the area's significant life sciences and shipbuilding sectors. The actors in the cluster have participated actively in networks on both regional and international level.

Contact: ICT Turku Ltd
www.turkusciencepark.com

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Networking is Everything

The Finnish Software Council is a network of industry operators that comprises the Centre of Expertise for Software Product Business / Technopolis Ventures Ltd (Helsinki region), ICT Turku Ltd, Jyväskylä Science Park Ltd, Lahti Science and Business Park Ltd, Oulu Innovation Ltd, Prizztech Ltd (Satakunta), SoftaTest (Savonlinna) and Technology Centre Hermia Ltd (Tampere). The council has created shared national instruments for cluster development (all reports are available in the Research Insights section of the www.swbusiness.fi -service):

Software Product Cluster vision 15:40 is a common conception of the future to the year 2015 that serves as a basis for strategic work and for planning and implementing development actions.

The Internationalization Handbook for the Software Business has been prepared to help software firms globalize their operations.

The National Software Industry Survey provides basic information on the Finnish software product industry. This annual survey provides an active measurement and development instrument.

Business Development and Internationalization Programs are conducted by various partners. These programs provide information, contacts and specialist assistance in support of international expansion.

Discover the best Finnish software contacts at www.swbusiness.fi! Swbusiness.fi is an international window on Finnish software product companies and the software product cluster. The mission of the web site is to leverage first class regional knowledge, competitiveness and expertise and to serve as a resource for business operations. The service currently includes over thousand Finnish company profiles.



vision

SOFTWARE PRODUCT CLUSTER VISION FOR 2015

By 2015 the software product cluster will be a new cornerstone of the Finnish economy playing a significant role in the value chains of other industries. At least 40 companies will be global leaders or in the top three in their chosen sectors.

[The software product cluster]

- A network of software-intensive businesses and their support organizations.
- The cluster includes:
 - businesses providing commercialized (and customized) software and associated services,
 - universities, research institutes and other educational institutions,
 - centers of technology and expertise,
 - representative organizations,
 - public and private financiers,
 - businesses providing knowledge-intensive business services (KIBS),
 - public sector agencies.

Objective: the companies in the software product cluster will be internationally and systematically networked.

[A software product enterprise]

- A company registered in Finland that provides software products and associated services.

[A new cornerstone of the Finnish economy]

- One of the most important Finnish business sectors in size and operation. By the year 2015 the cluster will have revenues totaling EUR 15 billion, directly employing 60,000 people in Finland and abroad, with 40 internationally listed companies.

[A significant role in the value chains of other industries]

- Software products and services:
 - Will form part of the software-intensive systems of other industries.
 - Will accelerate the evolution of other industries and improve their quality, efficiency and profitability.
- The software product business will exploit new innovations and operating methods in a networked manner that transcends the industry boundaries.

[Global]

- The products and/or services of the industry or company serve global markets.

[An industry market leader]

- The highest revenue and/or profitability in its market segment.
- Competitive

[One of the top three]

- One of the three leading companies in terms of revenues and/or profitability.
- A pioneer in products and operating methods, regarded as one of the three most important players in its sector and seen as:
 - An innovator - seeking and creating new product concepts and business practices, and applying these concepts and methods in a new way that also transcends industry boundaries.
 - Operating in a more customer and market-oriented manner.
 - An opinion leader.

More Resources for Preventing Information Security Incidents

Erka Koivunen, Head of CERT-FI, Finnish Communications Regulatory Authority

CERT-FI, which functions within the Finnish Communications Regulatory Authority, is a national authority that deals with information security incidents in communications networks and services. Despite its small size, the unit, which was founded in 2002, has been able to produce high-quality information services for the benefit of Finnish society. Starting at the beginning of next year, CERT-FI's resources will grow and its area of operations will expand.

The Finnish Communications Regulatory Authority (FICORA), which is part of the administrative domain of the Ministry of Transport and Communications, has a very wide area of operations. In addition to guiding and supervising telecommunications within Finland, the authority also functions as a national information security authority. A central part of the operations of an information security authority is to deal with information security incidents and maintain awareness of the information security situation. From the beginning, CERT-FI has focused in its operations on managing the information security of telecommunications networks and services. It was believed that this would increase the security of Information Society most effectively, and this has been borne out by experience.

Nevertheless, growth in electronic transactions and the increasingly central role of information technology in enabling all business operations have increased the pressure on CERT-FI to expand its customer base outside its traditional field made up of telecom operators. A law that will come into force at the beginning of 2007 will address these demands, as CERT-FI's customer base will expand to include companies that participate in maintaining Finland's Critical Information Infrastructure Protection (CIIP). At the same time, CERT-FI will gain access to greater resources.

Our most important services are the confidential processing and resolution of information security incident notifications, multifaceted situation awareness services, and education. We invite members of our expanded customer base to come and discuss fine tuning our supervision services, focusing our situation awareness services, and taking into account the special features of the industry. The use of CERT-FI's services will remain completely voluntary. ■

Consumers, Companies and Associations Will all Benefit from Information Security in the Internet

Sami Kilkkilä, Head of Networks and Security, Finnish Communications Regulatory Authority

The regulations and recommendations given by FICORA create the basis for greater information security for the Internet. Changes have been made in the rights and responsibilities of telecom operators with respect to the information security and functionality of email services and Internet access services.

At the end of 2004 FICORA issued a regulation concerning the information security and functionality of email services. The primary aim was to create clear and consistent rules for telecom operators about information security for email services. In addition, the authority wanted to increase the usability of email services.

In practice, telecom operators can restrict outgoing email traffic from a consumer account under certain conditions. This is intended to prevent the outflow of malicious software and spam to an external network. After this regulation came into force the number of sources of spam in Finnish telecommunications networks fell significantly. It also clarified the responsibilities and rights of telecom operators to intervene in harmful traffic.

At the beginning of 2006 the Finnish Communications Regulatory Authority gave a regulation concerning the information security and functionality of Internet access services. Its purpose is to increase the information security and usability of Internet access services with respect to both the core networks of telecom operators and consumer accounts. At the same time it increased the consistency of the information security procedures of various Internet service providers. The goal is that when a customer starts to use an Internet account information security would be in order from the beginning. Internet service providers should also provide the customer with information about the information security risks associated with starting to use the service and possible ways of eliminating these risks. ■

Unofficial English-language translations of the regulations and recommendations can be found on the website of the Finnish Communications Regulatory Authority at www.ficora.fi

The quality development of eLearning is a continuous versatile dialogue. The point of view of versatility emphasises that there are a large amount of different practitioners: e.g. designers and producers of eLearning applications and solutions, suppliers of different technology services, tutors, instructors and learners. The development of quality requires constant discussion with all practitioners.

Quality Development is a Dialogue

Titi Tamminen, Project Manager, The Association of Finnish eLearning Centre

The Winner of the eEemeli 2006 competition and eKansalaisuus Series

WSOY Oppimateriaalit Oy's Opit-service

■ The first prize was awarded to WSOY Oppimateriaalit and the City of Espoo for their successful co-operation. With the help of Opit-service the City of Espoo and WSOY Oppimateriaalit have together carried out the Espoo strategy according to which all students have to use Information and Communication Technology frequently in different subjects.

From the beginning of 2005 all 3.000 teachers and 30.000 pupils of Espoo have had access to the internet based Opit-network environment. Teachers have networked inside the city and created their own functions and development forums in the network environment. WSOY's Opit-service includes the learning environment with different tools, ready digital contents and user services as well as the teachers' education according to the education plan.

Companies' Business Processes Series

Tieturi Vision Oy - Familiarise Yourself with the Economic Indicators of eLearning

■ A computer course familiarises the learner with the basics of company economics - operation field, basics of business, economic indicators and financial statements. The course can be included a customised part for a company. The content has been presented from different point of views and using several media. The administrators of the course can monitor the participants of the course on a separate follow up page. The structure of the course has been designed together with three client companies.

Vocational Competence and Personnel Training Series

■ 3T Ratkaisut, a company specialising in occupational safety, made a multimedia based e-learning for the bus drivers who operate in the Kamppi terminals in the centre of Helsinki. The bus drivers are trained in advance to operate correctly both in usual and unusual situations. The training contains the matters which have arisen in the risk analysis of the terminal, done by 3T.

Especially challenging is operating in underground premises. The role of drivers is very important in the Kamppi's Espoo and long distance bus terminals, especially in the areas of fire, traffic and passenger safety. The quick and correct actions are extremely important, especially e.g. in the case of bus fire or traffic accident.

The e-learning solution has proved to be a very efficient, suitable and interesting method by over 7.000 drivers across Finland.

The challenge of the quality development is big because of the versatility and diversity of the practitioners. The important part of the quality thinking of eLearning is to outline the different roles properly and to develop the different practitioners' own quality functions.

That is why one has to develop in the eLearning field the quality movement that covers the whole sector and emphasises the meaning of high-quality operation for its most important matter: good and high-quality learning.

The Multidimensional Quality of eLearning

The Finnish Association of eLearning Centre organised with its co-operative partners its fifth eEemeli quality competition of eLearning products in spring 2006.

WSOY Oppimateriaalit Oy and the City of Espoo were chosen as the best eLearning solution. The winners of the other competition series were Tieturi Vision Oy's "Familiarise Yourself with the Economic Indicators of eLearning" and 3T Ratkaisut Oy's "The Kamppi Bus Terminal Familiar to Drivers".

The jury consisted of the eLearning experts from the private and public sector, pedagogy and education. The chairman of the jury was professor Yrjö Neuvo, Nokia Corp. The co-operative partners of the competition were Nokia, Nordea, Microsoft, The Technology Industries of Finland, Technology Centre Innopark Ltd, The City of Hämeenlinna, HAMK University of Applied Sciences, The Finnish Association for Human Resource Management - Henry ry, The Association of Independent Producers in Finland - Satu ry, Häme and Uusimaa Centers of Experties and Edutainment.fi. Carrying out the competition is a good example of the network operation and the Finnish public-private partnership operation mode. ■



ASSOCIATION OF FINNISH
eLEARNING CENTRE

More Information:
<http://eoppimiskeskus.net>
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TKK Dipoli

A Beacon of the Otaniemi Campus

Matti Sinko, Senior Project Director, TKK Dipoli

Helsinki University of Technology (TKK) and its Lifelong Learning Institute Dipoli radiate to all directions from the heart of the Otaniemi technology hub, near the capital of Finland. TKK Dipoli is not only an integral part of the TKK campus but a renowned beacon of continuing education and the e-learning world. With its over one hundred staff and 12 M€ turnover it has got excellence that sheds light of expertise indispensable in exploring the most challenging unknown, the future.

TKK Dipoli pools its strength from collaboration with other success makers near and further-a-field in seeking new solutions to challenges of emerging information society and its development in areas of e-learning and other methods of innovating competence development systems. In today's world not only business, research and development are global, but the same globalisation is taking place in higher education, including continuing education. One needs to understand value networks, and become involved in knowledge creation. Otaniemi is one of the hottest spots of science and technology in the world. TKK Dipoli has got all that it takes to rank high in the league table of global players in continuing education. As the largest university continuing education unit TKK Dipoli is indeed a major player in the European continuing education of engineers.

“TKK Dipoli considers not only Otaniemi, Finland as its home base but it is firmly rooted in the European innovation context. This solid background is helping us go global not only in our thinking but also in our networking and operations,” boosts **Markku Markkula**, the director of TKK Dipoli. The Finnish Ministry of Education has also acknowledged the work done in Dipoli and elsewhere in the TKK campus by recently nominating TKK as the “University of Excellence in adult education 2007–2009”.

Let us have a closer look then, what it is that constitutes the success story of TKK Dipoli.

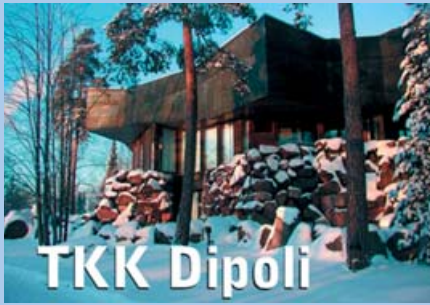
“Our *European portfolio* is full of activities that fit well together. Such a synergy allows us to easily add new useful research and development projects and training programmes as needs emerge. During the Finnish presidency of the European Union Dipoli will be hosting several events. The flagship event for us is clearly the EU eLearning Conference in July when the e-learning and technology enhanced learning experts and practitioners convene in Dipoli in order to share experiences and best practices gained through EU's IST and e-learning programmes. In addition to that, we look forward to hosting a major Living Lab event in Dipoli as part of EU i2010,” continues Markkula.

Conferences only make visible the serious and sustainable development work carried out in numerous projects intertwined through carefully woven networks of excellence, which TKK is also involved in. Markkula starts name-dropping: “Such are CLUSTER and NoE PROLEARN. Important memberships for TKK Dipoli are also the European Society for Engineering Education, SEFI, and more specific networks such as EuroPACE or MENON. I do not need to spell out these acronyms, you just check through the Web if you are interested. By the way, do you know what connects the father of the Web to us? We hosted the Finnish Millennium Award Ceremony, when Tim Berners-Lee was awarded one million euros in 2004.”

Markkula's senior staff members **Tapio Koskinen** and **Matti Sinko** take the pass

and kick the ball further: “Through these partnerships TKK Dipoli seeks to contribute to improving the European competence and competitiveness.” Altogether TKK Dipoli alone is currently involved in more than ten different EU-funded projects ranging from developing methodologies for arranging mass events eco-efficiently (ECOMASS) jointly with IAAF and the UN to building pan-European competence translator to match the needs of employers and individual competences or from supporting pan-European policy development for lifelong learning to methodologies of foreseeing the training needs of SMEs, not to mention the ongoing European R&D road-mapping work for enhancing the take-up of eLearning in European industries (PROLEARN). TKK has recently set up collaboration with UN Habitat programme and under its auspices is currently drafting a global training programme addressing building sustainable communities.

Anna-Kaarina Kairamo, a third member of the TKK Dipoli international team, having just returned from a mini-sabbatical at the Catholic University of Leuven, reminds us also about the importance of working together not only at distance but through concrete benchmarking: “When you sit and share the room with colleagues on a daily basis and not only in meetings, it makes easier to keep in mind also the needs of on-campus students. This is important to us, since TKK Dipoli has the responsibility of not



TKK Dipoli is an international meeting point and an innovative developer of working life.

Some of our education and training activities in 2006.

- Radical innovations – from Technology to Product and Service Ideas
- Technology Trends
- Global ICT Professional - internationalization programmes
- Producer of Network Services - How to Manage Production Entities
- Information management
- From Product Idea to a Commercial Product
- Usage Security and Acquisition of Information Systems' Services
- Management of Business Operations' Continuity
- Master of Project Management
- Diploma in Project Development
- Diploma in Operations Management
- Turbo – Essentials of Operations Management in Two Days
- MOB – Changing Business Operations of a Mobile Operator
- ChangePro – Niche Training for ICT Competence Needs
- OTAe – e-Learning as a Success Factor in the Networking Business Environment
- Building Developer Programme
- Refining of Geoinformatics
- Tailored Management Training Programmes

The navigation and foresight capacities have made TKK Dipoli and the whole Otaniemi technology hub so successful.



only reaching *out* to TKK alumni but to reaching *in* to give pedagogical support to TKK's professors and other teachers on the campus. This service is a real lifeline between us and the main university."

Sinko is in charge of the Dipoli Africa desk: "In our *Africa basket* we have colourful tapestries woven together with partners from South Africa, Mauritius and Botswana:

- matching Finnish and African Information Society Technology concepts and thinking;
- developing e-learning capacity and resources and supporting emerging good practices in the Sub-Saharan area;
- kicking off the ball to the South African football arena for more ecological ways of arranging big sports events, in particular the next FIFA Cup in mind."

"We have some delicate *Asian china* we want to handle with care", reminds Koskinen, and lists older and newer contacts in Asia, such as the Asian Institute of Technology in Bangkok, the Tsinghua University in China, and the National University of Singapore. We are seeking opportunities to develop regional innovation systems, SME-driven software business collaboration with India, and to develop continuing education of Chinese engineering education institutions."

Markkula reminds, however, that the oldest and still intense partnership activities TKK Dipoli has with the University of Wisconsin dating back to 1980s. "There are other old labels as well on our *American travel trunk*, such as Doing Business in Eastern Europe, a success training programme with the North-Western University", he adds. The @LIS programme has brought Latin tints to the label collection of collaborating partners.

This tour around the globe is a convincing evidence of TKK Dipoli's undaunted spirit of exploring the unknown and willingness to collaborate and share with likeminded partners in any corner of the world. |

Well Life Center New Welfare Services through ICT

Katariina Raij, Director in Professional Higher Education, PhD (Educ.), Laurea

Well Life Center is dedicated to producing welfare innovations such as new products, working models and working cultures. It also strives to spread and increase the productive capacity of innovations.

WLC encompasses universities, public and third sector organisations as well private companies, all dedicated to innovative R&D in the field of welfare. The private companies involved also engage in normal business activities. WLC has operated in the Helsinki metropolitan area, in Otaniemi, Espoo, since 2004.

Physical and Virtual Meeting Place

Well Life Center bases its activities on research. The Japanese philosopher Nishida has identified the Ba concept as a physical, spiritual and virtual meeting place. At the same time, the Japanese researcher Nonaka (e.g. Nonaka, I., Reinmoeller, P & Senoo, D 2000) has, with his colleagues, examined the meaning of the meeting place (Ba) and found that Ba enables the discovery, sharing, refining and reproduction of something new.

The Finnish researcher **Katariina Raij** (2000, 2003) has identified the orientations of knowledge as orientations of the specialist, processes, client and researcher. These together formed the original framework of Well Life Center as a meeting place for welfare specialists, welfare production and development processes, welfare clients and welfare researchers.

In WLC's view, in the future it will be vital to develop new solutions for human welfare. ICT has now been applied for two years in WLC and, as result, impressive new innovations are emerging. International cooperation has also been achieved, through the participation of Japan's Tohoku Fukushi University, where interest in WLC's ICT expertise manifests itself e.g. in a joint R&D agreement.

Physically WLC consists of various meeting spaces and auditoriums, core and competence based workshops, as well as laboratories like LabLife for process



Project manager Pasi Nissinen is the head of welfare technology team in Well Life Center.

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identification and modelling, HabitLab for development of habitation products, and ActivityLab for measuring and testing of physical capability – all well equipped with ICT technology.

Specialist Team on Welfare

The development of welfare expertise and WLC's activities is the responsibility of Dr Katariina Raij (PhD) and responsible for WLC's physical environment is Director **Jussi Kokkila** of the Laurea University of Applied Sciences. At WLC Laurea specialists work in three teams: Welfare Service Expertise, Welfare Technology Expertise and Welfare Business Expertise. A total of 35 Laurea senior lecturers work at WLC, all holding doctoral (5), licentiate (6) or master's (24) degrees. The number of PhD degrees is set to grow, as five of the lecturers are engaged in post-graduate studies.

Four research and development paths are being followed, these being:

1. old-age welfare advancement and maintenance
2. family welfare advancement and maintenance
3. working ability advancement and maintenance
4. social responsibility advancement and development.

Student Participation in Projects

At WLC the Laurea students' learning environment comprises R&D projects and joint partners' workplaces. From the outset, the students are actively involved in various R&D projects, learning through development. Workshops help them acquire the tools necessary for driving the projects forward. WLC's R&D exercises are genuine working projects involving Laurea's lecturers and supporters, students and real-life working experts.

Welfare expertises can be identified in relation to nursing, public health care, physiotherapy and social work with all their specialities.

Example: Caring TV

One ICT innovation is the Well Life Center's Caring TC centre, which serves as a pilot for a virtual clinic, presently under development. Caring TV is a bidirectional, interactive TV system which enables virtual directions and advisory services to the home, via the recipient's own TV set.

The pilot's target group, the aged, can when they wish be in contact with the Caring TC centre and can, via an interactive, image-based connection, receive directions, support and guidance that make it possible for them to continue living a home. Recipients are also sent participatory programmes aiming, for example, to improve physical fitness. In the TV centre, the expert on duty is able to see all the participants and help them with feedback and advice. In this project, Laurea is responsible for content provision and researching the project's results, while technological expertise is provided by the project's partner company TDC Song and client expertise by Espoo City.

Under development is expansion of the pilot to various, different age target groups and both public and private sector clients.

Many Challenges for ICT

For WLC, the goal of ICT expertise is to define and develop technological solutions that help to reform service structures, and develop and nurture new companies. Another goal is to improve the cost efficiency of welfare services. The application of ICT expertise as a tool for welfare specialists enables the construction of WLC's virtual clinic.

WLC's guiding principle is the genuine, research based development of working life as a process that enables creativity, and the sharing and refinement of empirically obtained information, in order to discover and produce new innovations.

The WLC concept serves as a worthy model for international companies that wish to develop ICT innovations for the welfare sector. Proliferation of the concept requires that both the public and third sector identify their roles, in cooperation with the universities, in the reform of welfare services and service structures. |



Otaniemi is one of the most innovative regions in Europe. Extensive research and high-quality infra-structure attract top talents from all over the world.

Otaniemi Marketing Bridging Innovation and Business

Otaniemi Marketing, Photos: Studio Blick Ltd



Otaniemi is the leading technology hub in the Nordic countries, with a unique mix of top-level research organizations, academic institutions and technology businesses. It offers an inspiring working environment for experts, students, companies and organizations. Located in Espoo, Otaniemi has established itself as integral part of Finland's innovation framework.

The "Otaniemi Model", which emphasizes diversity and collaboration, has served as the inspiration for numerous technology centers both in Finland and abroad.

The Otaniemi community includes 15,000 students of the Helsinki University of Technology (TKK) as well as 16,000 technology professionals and researchers.

Innovation through Cooperation

Otaniemi is home to over 600 companies, with 60 to 80 new businesses founded each year. The Otaniemi area receives over 200 patents each year, and over 1,000 academic degrees are completed at TKK.

For start-up companies, Otaniemi offers a strong ecosystem of other companies and an array of business development services. An increasing number of large enterprises and research organizations are establishing themselves in Otaniemi. These

"You are welcome to visit us and join the Otaniemi community", says Elina Silverang, Otaniemi Marketing.

companies value Otaniemi's solid infrastructure, innovative and entrepreneurial spirit, and the availability of a wide base of potential employees.

At the Forefront of Science and Research

Otaniemi was established as the campus of TKK and the VTT Technical Research Centre of Finland in 1949. The campus has also served as the athletes' village in the 1952 Olympic games and the 2005 World Championships in Athletics. The area boasts buildings designed by Finland's leading architects.

Otaniemi is a prime example of how proximity fosters successful collaboration. The EU Commission has nominated Otaniemi twice as one of the most innovative regions in Europe. With its panoramic perspectives, Otaniemi continues to develop the research, products, and companies that drive the economy of Finland and northern Europe. ■

www.otaniemi.fi

OpusCapita Ltd is the leading provider of cash flow automation solutions in the Nordic region. With our expertise and innovative software solutions we've helped thousands of companies on their way toward better cash management.

Money without Limits

In the last few years, many steps have been taken towards smoother transfer of money across national borders. New straightforward solutions enable fast and cost-efficient payment traffic and accurate management of international money flows.

“Nowadays, companies very rarely need to think about the complexities of local payment solutions in different countries. Direct banking connections are becoming increasingly versatile in Europe, and the payment and account services of international banks can be accessed through a single point of entry. All this enhances the centralised liquidity management of internationally operating businesses,” says **Harri Rantanen**, R&D Manager of OpusCapita. With 20 years of experience OpusCapita is the leading provider of cash flow automation software and solutions in the Nordic region.

“Cash flow monitoring and centralised management of accounts and payments, as well as their integration with banks and corporate ERP systems, are at the core of international liquidity management. OpusCapita can deal with country-specific bank interfaces, enabling payments and the related information to be transferred smoothly in the system from a customer perspective, irrespective of the bank's geographical location,” Rantanen remarks.

Within the European Union, EU payments, i.e. those not exceeding €50,000, can already be made at the price of domestic payments, taking maximum of three banking days to reach the beneficiary.

However, a change that will do away with cross-border payments in the eurozone is already underway: SEPA (Single Euro Payments Area) will turn the eurozone into one domestic payment area.

Globally speaking, payment barriers have already been lowered by allowing companies direct access to the SWIFT network of financial institutions.

“Centralisation and service orientation have been the prevalent megatrends in financial management since the turn of the millennium. For example, the opening of the SWIFT network, which has already taken place, is one step towards the change that will enable more flexible use of banking services across national borders,” notes Rantanen.

OpusCapita software is integrated into SWIFT applications, which enables the transmission of payment and transaction data in the international banking network.

SEPA to Remove National Barriers

SEPA means major system changes to banks, software vendors and businesses.

“The implementation of SEPA will remove all limitations regarding the transfer of data and transactions. Payments made within the eurozone will be similar to national payments. For example, local account numbers will be replaced by IBAN numbers and BIC codes,” says Rantanen.

SEPA will bring about changes to the entire financial process of internationally operating companies, including invoicing, payment and bank statement reporting. It will be possible, for example, to submit all euro-area payments in one batch, but USD and JPY payments will continue to be handled in a different way.

“Customers can rely on OpusCapita to develop tools to facilitate the implementation of new standards and manage the transition period preceding SEPA, just as we did in Finland when the country adopted the euro.”



Photo: Ari Ijäs

“Centralisation and service orientation have been the prevalent megatrends in financial management since the turn of the millennium. For example, the opening of the SWIFT network, which has already taken place, is one step towards the change that will enable more flexible use of banking services across national borders.”

Harri Rantanen, R&D Manager of OpusCapita

Business Opportunities Worldwide

Marjaana Karjalainen, Head of ICT Industry, Finpro

Finland is among the world's most competitive and technologically advanced countries. ICT is one of the corner stones of the economy. The Finnish ICT cluster consists of about 6.000 companies, ranging from technologies to services, from digital content to enterprise solutions, from network infrastructure to equipment manufacturing.

Many of the companies operate globally. In addition to Nokia, there are many prominent small and medium-sized ICT companies. Finland is, in fact, the home base of a large number of international niche leaders in areas like digital entertainment, data security and wireless solutions. Finns have always been eager to adapt new technologies which make their lives easier.

Turning Opportunities into Business

Due to a small home market, Finnish high tech companies need to start their internationalisation early on, some of them even at the moment they are founded. Global opportunities seem very lucrative, but commercial success needs a lot of work. Often you have to be very quick to reap the opportunities. Those Finnish companies

that can flexibly adapt their offering and business model to meet the changing industry environment will be the ones which have the best opportunities to be long-term winners. Industry foresight is needed to identify those changes in time.

Finpro's task is to challenge Finnish growth companies to grasp the business opportunities we see in our Trade Centers in more than 40 countries. Finpro's foresight projects aim at identifying technological and commercial changes meeting our clients' business environment and turning them into opportunities. In addition, Finpro encourages foreign technology and commercial companies and organisations to develop business relations with Finnish companies.

Challenges of Internationalisation

Innovative technology is a requirement for success, but it is not enough to guarantee profitable and growing business. Most companies in the early stages of internationalisation face the same kind of challenges. They need to find answers to questions like: How to understand changes in the market, how to identify customer needs outside Finland, how to prioritise markets, how to find reliable partners, how to formulate the internationalisation strategy, how to build the value proposition both for potential customers and partners.

Finpro has gathered best practices of entering global markets. Systematic work gives the best results in internationalisation. Finpro's consultants work together with our clients in all the phases of internationalisation from analysing business opportunities to sparring the strategy development, from partner search to concrete implementation of market entry. Finpro's Global ICT Team has nine professionals who know both the ICT business and the global markets. They are backed by more than 30 local ICT business experts in our Trade Centers.

Business opportunities do exist worldwide. Come with us to take your share! |

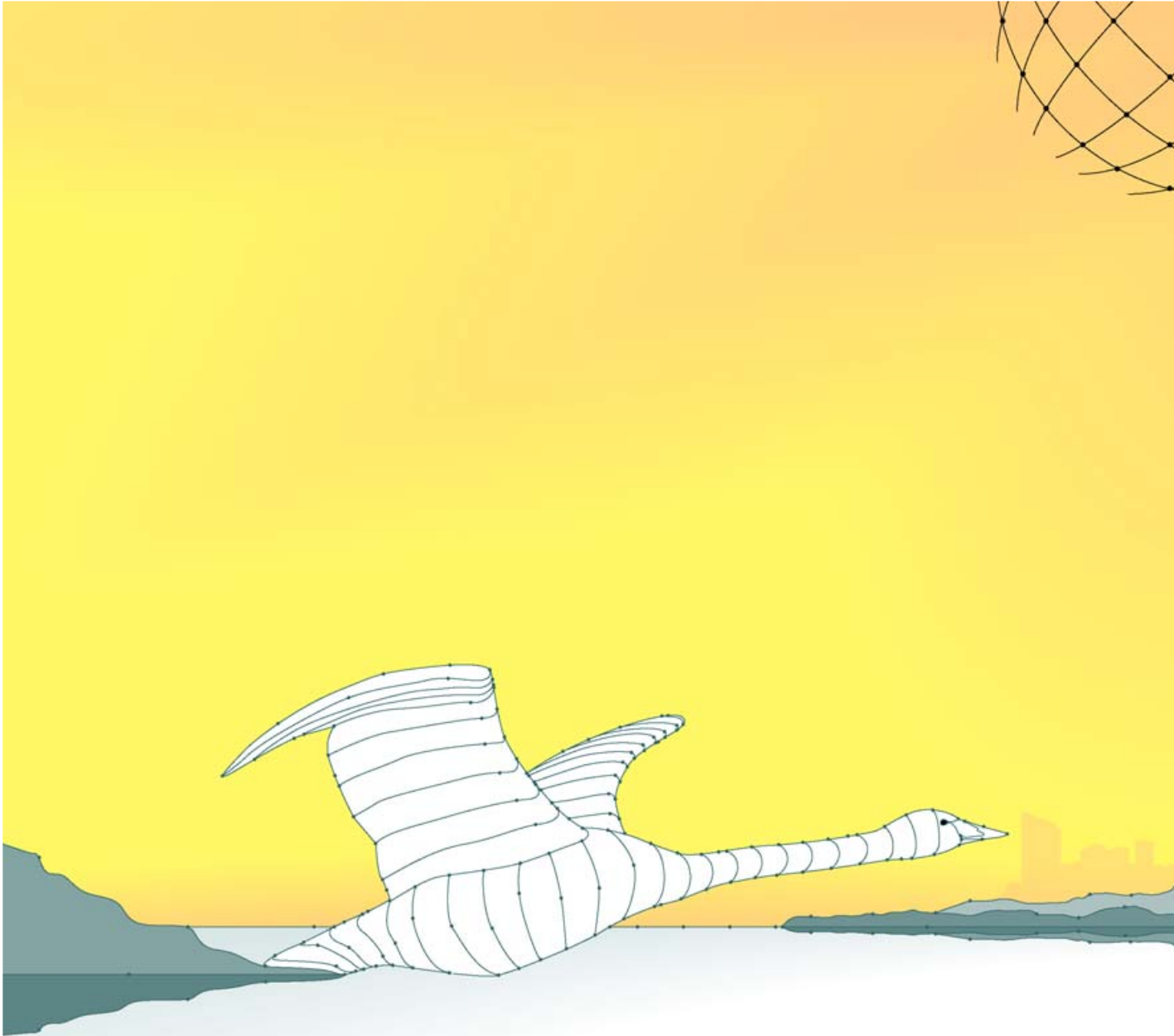
FINPRO

Finpro is focused on accelerating the internationalisation of Finnish companies. We partner with our clients to sharpen their global business skills, to enhance their knowledge base and to manage risks. We work with our clients in every aspect of internationalisation. Our global industry teams guarantee our clients the best service and the latest information on global trends and opportunities. We know the Finnish supply and the global demand. Our expertise is based on thousands of assignments we have completed with our clients. Our clients' access to global markets is accelerated through Finland Trade Centers worldwide in over 40 countries.

Finpro carries out this national task through a client-oriented approach in co-operation with other service organisations working towards the same goals. Finpro is an association consisting of over 500 companies, the Confederation of Finnish Industries EK, the Finnish Entrepreneurs Organisation and Technology Industries of Finland. It is supported by the Ministry of Trade and Industry through a public-private partnership.

"Innovative technology is a requirement for success, but it is not enough to grant profitable and growing business."

Marjaana Karjalainen, Head of ICT Industry, Finpro



Forum Virium Helsinki

Corporations, R&D institutions and the City of Helsinki co-create future digital services in the Forum Virium Helsinki cluster. The cluster will act as the driving force for customer-driven service and content development.

Forum Virium Helsinki was founded by an initiative coming from many significant players in the digital services sector in Finland. Digitalisation has broken down sectoral barriers and places demands for open innovation and co-operative services development.

Forum Virium Helsinki's mission is to act as a matchmaker between partners. The Forum's activities build on actual future concepts, programmes and projects of the partner companies. The cluster will help to speed up the commercialisation of products and services in six

main project areas: digital home, healthcare, learning, retail trade, traffic and multi-channel event media.

Creating a real-life test bed environment with content, services, connections and hardware, the cluster also participates in the development of the second centre of our capital, Helsinki. The new technology hub is located in the central Pasila area, creating a vital environment for future concepts development.

Finland is a forerunner in technology, with considerable knowledge, resources and capabilities in the fields of mobile and Internet services. But technological innovations are not always commercialised to their full potential. Thus Forum Virium's role is to make sure the existing knowhow is used to create services based on customer needs.

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**FORUM
VIRIUM
HELSINKI**



Dan Steinbock

The Finnish Success Story The Role of NOKIA

According to The Global Competitiveness Report 2005-2006 by the World Economic Forum, Finland is the most competitive economy in the world, ahead of the United States. However, economic indicators do not tell the full story.

According to my recent study, Finland's Innovative Capacity (Finland's Ministry of Interior, May 2006), Finland's measured innovativeness suffers from vulnerabilities. It is dependent on the success of Nokia, the world's largest mobile handset maker.

A great divide prevails between two different views on the Finnish success. According to conventional wisdom, the "Finnish innovation system" is depicted as if it were led top-down by government agencies, through an array of domestic public sector entities.

In this view, the key players are the government and the Science and Technology Policy Council, the Ministry of Education and the Ministry of Trade and Industry, which finance the Academy of Finland and the Finnish Funding Agency for Technology and Innovation (Tekes), respectively. In turn, these two fund a wide array of excellence and expertise centers, which are based on public/private partnerships and industry/university cooperation, while the National Fund for Research and Development (Sitra) is directly dependent on the Parliament's financing.

According to this conventional view, the private sector has had a marginal impact on the Finnish success story.

Most international observers have taken these ideas at face-value. In reality, Finnish success is not due to the public sector, which has acted as a key *partner*. It is the private sector that accounts for the key

actors, which actually create prosperity.

Since the 1980s, the public sector has played a significant, but primarily supporting role. Since the turn of the 2000s, the contribution of the private sector to the national R&D has hovered at 70 percent. Universities and research institutes contribute only 20 percent and the public sector just 10 percent.

Historical Legacies

The recent literature on the Finnish success is silent about two things: the Cold War and President Kekkonen. There is a reason for this historical amnesia.

In the pre-Cold War era, Finland was still a relatively poor agricultural economy. The investment-driven stage ensued in the postwar era, roughly between the 1950s and 1980s. This period coincided with the Cold War and the powerful role of President Kekkonen in Finland's economic development, regional policy and the "special relationship with the Soviet Union."

Unlike most Western European nations – even Germany and Japan, the defeated world powers – Finland had no science and technology agreements with the United States until the late 1980s.

Foreign direct investment (FDI) reflects similar insulation. Enacted in the late 1930s, Finland's strict foreign ownership laws were liberalized only in 1993, when the closed economy was first opened for inward FDI – decades later than in most Western European economies.

After World War II, Finland's "special relationship with the Soviet Union" precluded the small country's participation in the Marshall Plan. The financial loss was compensated with generous US loans. However, the long-term impact of the Plan derived from the transfer of technology and managerial expertise. And that is what the Finns missed.

It was after the oil crisis in the mid-1970s that Finnish industrialists opted for *technology-driven* growth. This push was seconded by the public sector, particularly by the launch of Tekes in the early 1980s.

From the mid-1960s to the turn of the 1980s – through the peak of the investment economy – Finland was one of the laggards among the OECD nations. Between the late 1960s and late 1990s, the country's innovative capacity rose drastically.

How did it happen?



"From the mid-1960s to the turn of the 1980s - through the peak of the investment economy - Finland was one of the laggards among the OECD nations. Between the late 1960s and late 1990s, the country's innovative capacity rose drastically."

Dr. Dan Steinbock is the director of the New York City office of the Academy of Finland. He also serves as the ICT research director of the India, China and America Institute.

The Role of Nokia

In competitiveness literature, innovative capacity (measured by USPTO patents) is considered to be the foundation of productivity (competitiveness), which gives rise to national prosperity (GDP per capita).

The Finnish success story is based on Finland's innovative capacity, which rests on the strategies of a few world-class industry giants and their R&D strategies in core clusters – such as mobile, metal-engineering and forestry industries.

While Finnish businesses have dominated national R&D for years, most of the *measured* increase accrues to Nokia – a single Finnish company, not Finnish economy as a whole.

In the early 1980s, Nokia's bold technology strategy went hand in hand with its international growth strategy, under the leadership of Kari H. Kairamo. It created the basis for Nokia's global expansion, which began in 1992, when the new CEO Jorma Ollila bet the future of the company on the mobile business, divesting everything else.

In 1997-2002, for instance, Nokia dominated some 60 percent of the 'stock' of the leading Finnish firms' patents issued in the United States. This dominance actually rose from less than 40 percent in 1997, to more than 70 percent in 2002.

In the long run, Nokia's bold globalization – particularly the new R&D centers and networks in China and India – will contribute to the relative diffusion of Finnish R&D into the mobile clusters in emerging economies.

In order to remain globally competitive, Nokia, and other leading Finnish multinationals – Kone in the metal cluster,

Stora-Enso and UPM-Kymmene in the forestry cluster – must engage in ceaseless innovation, across the world.

Concentration and Dispersion

Envisioned initially by President Kekkonen, Finnish regional policy was based on the ideal of regional *equity*, until Finland joined in the European Union in 1995. Driven by the forces of globalization, European integration accelerates regional efficiency.

Still, critical components of the system – Helsinki University of Technology, VTT, and technology universities, polytechnics, TE-centers, centers of excellence in research, centers of expertise, science parks – are located in just half a dozen urban centers.

Regionally, the Finnish innovation infrastructure is highly concentrated and becoming more so. Today, more than 40 percent of this R&D is located in Uusimaa, or the Greater Helsinki region, and more than 80 percent in just four regions – in close proximity to Nokia's Finnish R&D activities.

Until the late 1990s, the core clusters in Finland still reflected strong domestic expansion. With globalization, key aspects of cluster development are migrating abroad.

Today, four Finnish cities – Helsinki, Tampere, Oulu, Turku – account for more than 75 percent of all business R&D. Most play a central role in Nokia's domestic R&D configuration.

Until recently, Finnish companies excelled in R&D. The reversal came in 2004, when business R&D began to decline. This change is magnified by longstanding vulnerabilities. Finland is

relatively weak in introducing unique goods and services. While strong in engineering, Finnish companies tend to be relatively weak in marketing.

Furthermore, the relics of the investment economy – high degree of taxation, weak linkages between pay and productivity, absence of competitive incentives – contribute to complacency.

In Finland, new enterprise formation is relatively low internationally. Public organizations play a critical role in (non-Nokia) R&D. While the role of public sector VC players is limited to less than 10 percent of the total capital under management, they account for more than 90 percent of the seed stage funding. The trend suppresses enterprise, initiative, and risk.

According to the World Economic Forum, Finnish industry/university cooperation ranks at the top of the world. Despite 20 universities and 20 polytechnics, only two organizations – Helsinki University of Technology (TKK) and the Technical Research Center of Finland (VTT) – account for most technology-driven R&D in such cooperation.

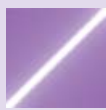
Crossroads

The Nordic welfare society was built on economic growth. In 2006, Finnish GDP growth is expected to amount to 3.5 percent. In Western Europe, this is a great achievement, but not sustainable.

In the absence of adequate structural reforms, Finnish competitiveness suffers from vulnerabilities and rigidities. As a result, Finnish companies in the core clusters are increasingly offshoring their non-core value activities.

As the momentum of global growth is migrating to Asia, even Europe's small tigers, such as Finland, find themselves at crossroads. ■

TIEKE Finnish Information Society Development Centre Promoting Open and Global Information Society



TIEKE

TIEKE actively promotes the construction of the information society, both nationally and internationally. TIEKE's key activities involve the promotion of public and private sector collaboration, interoperability, standardisation and the information society. In addition, TIEKE strives to create possibilities for small and medium sized enterprises to utilise the latest information and communication technologies.

More information in TIEKE:

Public Procurement:
Juhani Koivunen

UBL and RFID:
Heikki Laaksamo

Enterprise Interoperability:
Ville Saarikoski

International Trade Facilitation:
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Enterprise Interoperability Competence Centre

In 2006 TIEKE started an initiative to collect, analyse and study different types of networking by means of field cases. In this programme also comparison of networking and e-solutions is made between different systems and societies (e.g. countries). The target is to understand how new business models are emerging for interconnected companies and how the Internet is converging corporate networks by comparing these solutions with the structure of the Internet.

TIEKE works actively within EU initiatives promoting enterprise interoperability. The standards have changed

from the interoperability of standards toward standards of interoperability. In particular TIEKE promotes interoperable standards like ebXML and UBL and focuses on the standardisation challenges emerging from new possibilities to collect information, e.g. RFID.

TIEKE is also actively promoting national economy information systems and infrastructure like e-invoicing. These systems and their pilots are built using interoperable standards. TIEKE is also continuously developing new features and variations of the Computer Driving Licence to fulfil the needs of ordinary citizens' ICT skills.

eBusiness

The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), which operates under the UN Economic Commission for Europe, works at developing and harmonising trade facilitation recommendations. TIEKE participates in trade facilitation development work by serving as the secretariat for the Finnish trade facilitation workgroup, FINSIPRO.

TIEKE has played a central role in implementing important trade facilitation recommendations, such as the recommendation on electronic invoice usage and content (Recommendation 6), as well as the Single Window recommendation on one-stop shopping (Recommendation 33).

TIEKE is the Finnish partner of the initiative of the European Network of National Test-beds for eBusiness (ETeB), having other partners in Estonia, Iceland, Romania and Slovenia. ETeB aims to create a fully operational eBusiness community, a test-bed, serving as a model to facilitate eBusiness in Europe. A national test-bed for eBusiness is a venue for developing ideas and concepts, facilitating cross-border e-transactions, as well as utilising solutions and standards in eBusiness. ETeB offers a "first mover" advantage in systematic, nation-wide implementation toolset of eBusiness, contributing locally developed solutions into a common pool.

Public Procurement

The EU Commission has introduced a coherent EU framework for electronic public procurement that complements the EU's public procurement Directive which came into force in January 2006. The objective is to enable any business with a PC and an Internet connection to bid for public contracts electronically anywhere in the EU. As part

of the Commission Action Plan, member states have been invited to set up comprehensive national plans for rapid adoption of the directives and a tailored transition to eProcurement. TIEKE has worked with the Ministry of Finance and the Ministry of Trade and Industry to set up the Finnish national plan for governmental units.

International Programmes

Finland has been recognised as one of the leading global ICT countries. In addition to the trade of ICT products and services Finland is participating in global development by sharing its expertise and know-how in ICT with other countries, particularly with emerging economies. The new forms of knowledge sharing take place through traditional development aid but also through new forms of partnerships where industry participation is encouraged. One of the new forms of knowledge sharing is the business partnership program.

TIEKE is participating in this international collaboration: a new ICT program will be started in September 2006 to support municipal development and citizens' participation in Nicaragua. Further, a partnership programme with a South African organisation has been started to share TIEKE's role and experience in the development of the information society. An Open Source study in Latin America was recently finished. One of the roles of TIEKE is to bring Finnish private expertise in ICT to development projects.

Game Industry in Finland

KooPee Hiltunen, Director / Neogames

Main marketing event for Finnish Game Companies in 2006 was E3 in L.A. E3 was arranged as a Nordic Co-operation project and Finnish operation was conducted by Neogames. Picture is taken from Nordic booth.

The Finnish game industry is on a strong path of growth. Over the coming years, the business volume of the industry will increase as much as 50 percent each year. The support given by the public sector for the game industry at the start of the 2000s and the R&D activities carried out in companies are starting to pay off.

The strong development of the Finnish game industry can be attributed to three factors: the technical and content-related competence of companies as well as the excellent price/quality ratio and delivery performance in game production, added to the international rise of the mobile entertainment sector.

At this moment a major proportion of the game companies' turnover comes from export activities. In Finland, the domestic market for games is rather small compared with many other European countries, so companies cannot count on it to generate significant income in the future. Global markets are and also will be the main

market for Finnish game companies. From the companies' point of view this means, that game companies have to invest increasingly in export activities.

The Finnish game industry is often considered to be too dependent on mobility, but this is not the case. Success stories such as Max Payne, FlatOut and Habbo Hotel prove that there are an ample number of alternatives in PC and console games as well. Success in the traditional game market combined with mobile know-how guarantees that the Finnish game industry is also well-positioned to answer the challenge posed by multiplatform games in the future.

International research shows that the

creative economy is going to challenge the traditional industrial economy in the Western world, and the game industry is the most rapidly growing sector of the creative economy. In the case of Finland, this structural change has clearly been recognised, and measures have been launched to adapt to the new situation. The rise of the game industry in Finland is not a coincidence – it is the result of continuous investment in the sector.

The future seems bright. Nevertheless, investments are still important, considering the future of the game industry. Both the industry and the public sector have the will, know-how and resources to implement these investments. ■

The Finnish Ministry of Trade and Industry has produced June 2006 a publication about Finnish Game Companies. The publication can be found as a pdf-file from the ministry's website www.ktm.fi/.

The publication can also be found at Neogames' website www.neogames.fi/fingames
Neogames is a Finnish National Centre of Game Business, Research and Education.



Star Wreck: In the Pirkinning was released in August 2005, and in a few short months it became one of the world's most viewed Finnish films in history.

■ More than 4 million copies have been downloaded worldwide, and international media have followed the success of the film with interest, including Reuters, AFP and BBC.

Building on the vast success of Star Wreck, Energia Production now produces their next feature-length film, Iron Sky. The focus of the new production will be

internationality, both online and on screen.

The story of Star Wreck: In the Pirkinning is that of a starfleet captain who appoints himself emperor of the world, and goes on a crusade of conquest and mayhem to the ends of the universe. The catch of this uproarious sci-fi parody was that it was released online for free, at a time when major distribution companies were still wavering in the face of the new technology.

The Star Wreck continuum will be simmering on the back burner while Energia Productions focuses on new vistas. From an idea by Jarmo Puskala, one of the

writers of In the Pirkinning, was developed a new, amazing and hilarious story. A noted industry professional has been chosen to write the screenplay.

New Endeavour Iron Sky Taking off

The film will take science fiction and humour to the outer limits, and is called Iron Sky. The website gives an idea of the visual style, and there is an online forum open for speculation. Updates will be made as the production progresses. Energia is making no predictions about schedules. "It won't be seven years this time," promises producer Samuli Torssonen. |



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Information Society Statistics 2006

■ The publication is the fifth compilation volume to be published by Statistics Finland on the subject of the information society. The present publication uses data produced by diverse bodies concerning the development of the information society, aggregated and reclassified into statistics.

The past couple of decades have borne witness to rapid technological development, especially in information and communications technologies. Utilisation of information and communications technologies has become part of the everyday lives of people, business enterprises and public administration.

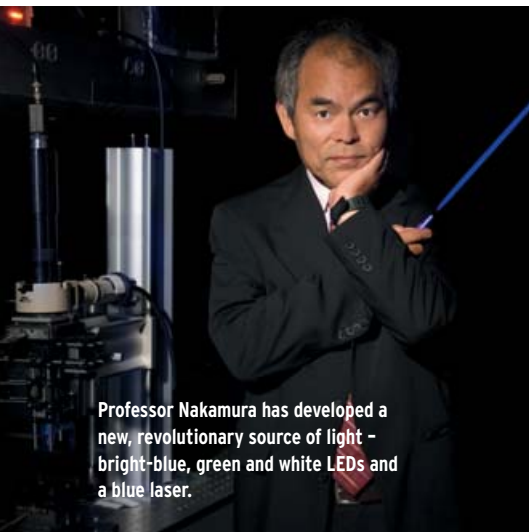
This publication draws a picture of the state of the information society in Finland and gives an overview of the phenomena that are typical of the information society at the turn of the millennium, whether it be use of information and communications technologies, diffusion and stocks of related equipment, entrepreneurial activity, production, foreign trade or employment. |

More information on information society statistics
http://stat.fi/tup/tietoyhteiskunta/index_en.html

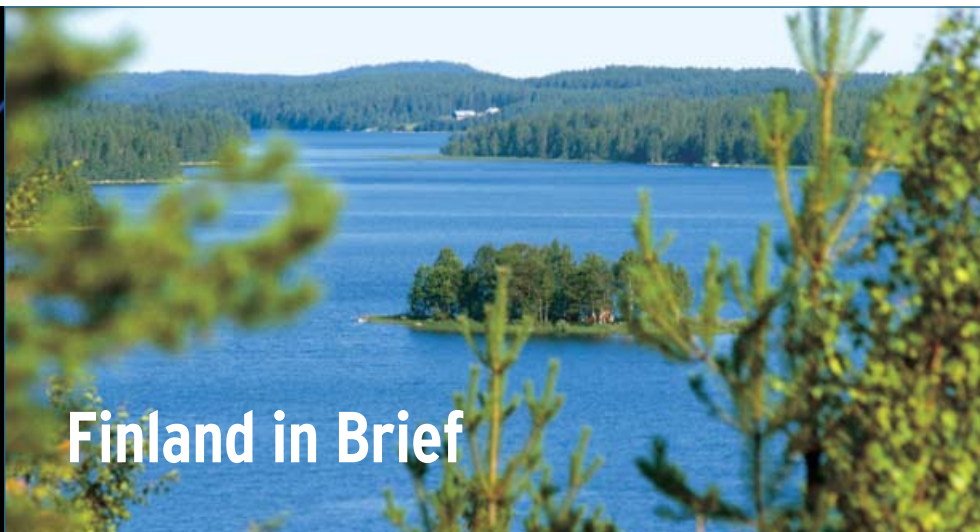
Other New Publications

The Information Society Council's Report to the Finnish Government:
"Towards a Vibrant Finland
- Information and Communication Technology & Productivity" 2006

"Towards a Networked Finland" 2005.
The reports are on the web www.infosoc.fi



Professor Nakamura has developed a new, revolutionary source of light - bright-blue, green and white LEDs and a blue laser.



Finland in Brief

Shuji Nakamura wins the 2006 Millennium Technology Prize

■ The 2006 Millennium Technology Prize has been awarded to Shuji Nakamura. Professor Nakamura has developed a new, revolutionary source of light – bright-blue, green and white LEDs and a blue laser. The world’s largest technology prize, now being awarded by Finland’s Millennium Prize Foundation for the second time, has a value of one million euros.

Professor **Shuji Nakamura**’s innovation has launched a totally-new sector in light-producing semiconductor research and development. His development also made possible the widescale industrial production of efficient, energy-saving LED lights and created the conditions for applications that improve the quality of human life.

Millennium Technology Prize

The prize celebrates innovations that have a favourable impact on quality of life and wellbeing. In particular, the prize seeks to highlight innovations that assist and enrich our everyday lives today as well as in the future.

The inaugural one million euro Millennium Technology Prize was presented to **Tim Berners-Lee**, the inventor of the world wide web, in 2004.

The prize is awarded every second year. Nominations for the prize can be made by academies, universities, research institutes and industrial organizations. Candidates are sought from across the world and all fields of technology.

The prize is conferred by the Millennium Prize Foundation. |

More information:
<http://www.technologyawards.org>

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 semiautonomous 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:

- 5.255 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

Languages

Finland has two official languages: Finnish and Swedish. Finnish is spoken by 91,3% and Swedish by 5,4% of the population.

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.

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