Join the pioneers of healthcare for Life and Passion.
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Yes we can!

The Finnish healthcare system is one of the most effective and functional in the world. It is characterised by joint commitment, broad-based cooperation and technological expertise – a networked innovation environment that provides a small nation with a strong competitive edge.

We strongly believe in open innovation and sharing ideas. We welcome other forerunners in the field to work with us. The challenges in healthcare are global, and cutting-edge innovations are required for everyone’s benefit. Innovating is a joint effort, and no nation or business should keep re-inventing the wheel.

What is unique in the Finnish healthcare market is the fruitful cooperation between the public and the private sector. There exists a real partnership between the governmental agencies, public funding organisations, research organisations and businesses, big and small. The whole network is striving to achieve common goals: making healthcare even more responsive to the customers’ changing needs and doing that in an economically sustainable way.

What we need to address the burning issues of healthcare is an active, responsible, “can do” attitude from all parties – the policymakers, healthcare authorities, service providers and the people themselves. We should all concentrate our efforts to keeping people healthy as long as possible and giving them the best possible treatment when it’s needed. Together we can.

Mauri Pekkarinen
Minister of Economic Affairs

Paula Risikko
Minister of Health and Social Services
Finland is leading the world in delivering preventive, patient-empowering healthcare. As one of the first countries to face the unique challenge of providing care for a large population over the age of 75, Finland has for the past decades been building a flexible, patient-driven and technology-based healthcare system. The fruits of this labour are now becoming visible and the country is sharing its success with international partners, customers and suppliers in the organisation, planning and delivery of modern healthcare.

The main source of healthcare expenditure is treatment of chronic illnesses, such as diabetes, cardiovascular diseases, musculoskeletal problems, allergies and allergy-related respiratory conditions. A total of 40 percent – about 2 million people - of Finland’s population is estimated to suffer from some form of chronic illness, and combined with the ageing of the population, the country requires significant developments to support the healthcare system.

The primary driver of development work is to redefine the value chain of healthcare. Prevention of chronic conditions and upgrading the patient-caregiver roles are the foundation for innovation. Prevention is achieved by promoting good health and increasing self-care, whereas the evolution of roles in the healthcare system affects the entire public-private care chain and its customers: citizens, caregivers, funders, technology providers and policymakers.

Comprehensive national programmes – such as Innovations in Social and Healthcare Services and FinnWell by Tekes – are fostering the public-private partnership model and locating import-export possibilities in the field of healthcare.

Another important goal of the development efforts is customer-centricity: the solutions, processes and products created should be user-friendly, motivational and easily transferable to different environments and needs.

One such an innovation is the e-prescription system, which is being prepared for national use. Legislation instituting e-prescription was passed in 2007, with the goal to achieve total coverage by 2011. At the same time, Finland is in the process of completing the Patient Record Archive (PRA), which covers all 5.3 million residents. The PRA is a centralised national archive, which will store, protect and provide continuous access to medical data to the citizens.

In the future, Finnish citizens will have a cradle-to-grave health record, in which all the relevant medical data is available for both the citizen and the healthcare professional.
The cornerstone of the Finnish healthcare system is universal access, as defined in the Constitution of Finland. By guaranteeing universal access, every Finnish resident has the right to adequate health services regardless of ability to pay or place of residence.

The healthcare system runs on three interlinking provisions of service: a public one offered by the 350 Finnish municipalities, the private healthcare system relying on National Health Insurance fees and the occupational healthcare system.

The state defines general health policy guidelines and directs the healthcare system on a national level. The Ministry of Social Affairs and Health sets broad development goals, prepares legislation and oversees its implementation.

The Finnish healthcare system is decentralised, and national oversight is rather limited. This means that the municipalities, which are the primary organisers of healthcare, have the power to decide on the quality and extent of services.

Municipal healthcare is funded via a public system paid mainly out of general taxation. The most important unit in the municipal system is the health centre. Health centres provide a wide range of primary care and specialist services, including general practitioner services, maternity and child welfare, dental care, school healthcare and long-term inpatient care. A typical health centre also provides rehabilitation, psychological therapy, physiotherapy and, in some municipalities, ambulatory psychiatric care.

The current Finnish healthcare system has evolved since World War II. In the 1940s, the most important healthcare reform was the establishment of a thorough network of maternity and child welfare clinics. In the next two decades, the focus was on building the national hospital infrastructure. Since the late 1960s, development centered around effective intervention with the critical health problems, such as cardiovascular diseases. For the remainder of the century – and up to today – the Finnish healthcare system has shifted its focus to early intervention, prevention and promotion of good health.

Redefining healthcare: from remedy to prevention

As is the case in many other European countries, Finland is facing the challenge of an ageing population. In 2007, people over 65 accounted for 16.9 percent of the population, and that population is growing. According to estimates, the number of people over 75 will double by the year 2040.

Finland’s total expenditure on health services in 2007 was 7.5 percent of gross domestic budget (which in 2007 was EUR 179.7 billion), with the EU average being 9.2 percent. The share of public expenditure on healthcare services was 77.8 percent, compared to 76.4 percent in other European countries.

The main source of healthcare expenditure is treatment of chronic illnesses, such as diabetes, cardiovascular diseases, musculoskeletal problems, allergies and allergy-related respiratory conditions. About 40 percent of the population
is estimated to suffer from some form of chronic illness, and when combined with the ageing of the population, is resulting in the need for significant changes to the entire healthcare system.

The primary driver of the development work centers around redefining the healthcare value chain. Prevention of chronic conditions or upgrading the patient-care giver roles are the guidelines, by which the actual steps are taken. Prevention is made of health promotion and increased self-care, whereas the evolution of roles in the healthcare system affects one and all citizens, care givers, funders, technology providers and policy-makers.

In terms of developing the business models, funding mecha- nisms and international partnerships, the most important public players in the field include The Finnish Funding Agency for Technology and Innovation (Tekes), The Finnish Innovation Fund (Sitra), the Ministry of Social Affairs and Health, Finland’s Slot Machine Association (RAY), The Social Insurance Institution of Finland, and the National Institute for Health and Welfare (THL).

A TOTAL OF 40 PERCENT OF THE POPULATION IS ESTIMATED TO SUFFER FROM SOME TYPE OF CHRONIC ILLNESS.

INNOHub – a shelter for creation

In January 2003, Philips Applied Technology opened an InnoHub in the city of Espoo. A joint effort between the Technical Research Institute of Finland VTT, Philips Applied Technology and City of Espoo’s Well Life Center, the InnoHub concept helps companies turn innovative ideas into a real business.

“The InnoHub is a physical place for generating and evaluating ideas. The Espoo Hub focuses on health and wellbeing, and the premises include a living room area, hospital room simulator and a nurses’ station. The space is an open care, and one of the ideas is to emulate connected care,” says Rob Kommeren, an innovation consultant with Philips Applied Technology. “We’re interested in turning existing technology into new applications. To do this, it’s crucial to get different views and user feedback into the equation. The power of the InnoHub concept is in closing the loop from idea to commercial product. We chose Finland because our studies showed that it was in the top 10 innovation hot spots in the world.”

Kommeren says that the interest shown by the Finnish Government further supported the decision. “The open space structure enables, among other things, interesting applications of wireless technology in sharing and storing health information. For instance, how you could retrieve the data from a personal device, such as a heart rate monitor and upload it onto your personal, web-based health record,” Kommeren adds.

IN/Finland the population is ageing faster than in any other EU country. In the next 30 years, the amount of elder people will increase much more than 85% while the working age population decreases.

In 2008, Tekes (the Finnish Funding Agency for Technology and Innovation) and the Helsinki University of Technology organized a TechBar event for American healthcare and technology specialists. Among the participants was Dr. Roann Fried, vice president of Innovation and Advanced Technology at Kaiser Permanente, an integrated managed care company with about 9 million health plan customers and a staff of 65,000. The event opened up new avenues of mutual learning and sharing. We’re focusing on the development of five healthcare areas, namely telehealth, time-saving technologies, management of chronic conditions, enhanced mortality through wireless technologies and new forms of care and treatment delivery,” Fried says.

“So there are definitely collaboration opportunities with Finland. I’d say that, for instance, the Finnish model of future healthcare with the patient as an integral link of the treatment chain is impressive. Also, the emphasis on preventive care is something we at Kaiser are very much focused on.”

Comprehensive national programmes such as Innovations in Social and Healthcare Services and FirstWayByTakes are aiming to develop the public-private partnership model and locating import-export possibilities in the field of healthcare. Another important goal of the development efforts is customer-centricity: the solutions, processes and products created should be user-friendly, motivational and easily linkable to different environments and needs.

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Cel’Amanzi was founded in 2006 by a 20-member team of former Nokia engineers with a vision: to take the profound expertise in Finnish mother-child care and employ it in developing countries.

“Our goal is to optimise wireless networks into social, peer-driven care networks,” says Cel’Amanzi founder Jyri Wuorisalo. Cel’Amanzi’s R&D activities are carried out in South Africa, close to poor women, who are in need of the midwifery assistance. The mobile phone is our number one platform—even the most distant African village has wireless service. What we do is work with community health workers and their customers, the citizens. Our initial customer is the local public health organisation, but most of the effort is put into very practical issues.”

For instance in Botleng, a South African village, the community health worker visits pregnant women and uses her cell phone as a virtual clinic. With practical demonstrations in the form of images, video clips and sounds, the health worker can coach her patient in the relevant issues of care. She also can use the mobile phone to capture and send images, text messages and clips to other community workers and doctors.

This way information gets shared, and the expecting mothers are spared the sometimes very difficult and long journeys to the closest clinic.

The Finnish mother-child care system is one of the oldest and most comprehensive in the world. Formalised in the 1940s, the array of prenatal services covers nowadays nearly 100 percent of pregnant women. Expectant mothers with normal, uncomplicated pregnancies have an average of 10 to 15 visits to prenatal care clinics. The prenatal and mother-child health clinics also are responsible for birth preparation, identification of complications relating to the pregnancy and referral for further treatment, if necessary. The clinics offer parenting advice and help the parents to establish a healthy and nurturing environment for the child, as well.
Growing up safe and sound

Once a baby is born, the care continues through childhood and teenage years. In the municipal healthcare system children up to age 6 have regular check-ups in child health clinics. The recommendation is for all children to have 16 periodic check-ups with doctors and health visitors. The clinics also administer the vaccinations provided under the immunisation programme.

Children over 6 years of age are covered by the school healthcare system. School healthcare is implemented in cooperation with pupils, other student welfare staff, teachers and parents. Each pupil is prepared a personal health plan, with close communication between parents and schools.

The Finnish educational system is among the best in the world. In 2007, Finland took the number one spot in OECD's (the Organisation for Economic Co-operation and Development) three-yearly PISA test of the abilities of a sample of 15-year old secondary school students. The survey comprised 400,000 students in 57 countries. Among the Finnish specialties of the school healthcare system are free meals for pupils, mandatory sports and exercise classes, and health education as a curriculum subject.

Computer and video games have seldom been ranked as the best possible leisure time activity, but things are changing.

The University of Tampere is developing a multi-sensory game concept, which aims at capturing young people's interest in wellbeing and health. The concept is being designed in cooperation with the leading universities in Finland, the U.S. and Japan. The result of the project is intended to be a multimodal gaming environment, which promotes health awareness in a social and positive way.

"Instead of sitting alone in their bedrooms in front of the PC, young players can access the game via mobile phones, laptops, home and school computers. Playing can take place in groups, at home or at school – but the key is interaction with others," explains Roope Raisamo, a professor at University of Tampere and consortium leader. "The key is to create a gaming experience in which sight, vision and touch are integrated. In addition to traditional controls, the game makes use of machine vision and motion sensors. The substance of the game involves health and wellbeing issues that are central to teenagers and young adults: the role of healthy diet, exercise, sufficient sleep, smoking, personal safety."

The game concept is now in the pilot stage, and the crucial issue is to make the game both entertaining and informative. All the R&D activities have centered the users' gaming experience, with a special emphasis on the educational aspect of learning.

The life-cycle of health and wellbeing

Growing up

Gaming for better health

Diabetes management for trendsters

IHDL Inc's diabetes management system is for people who appreciate good things in life. Sleek product design and customer-friendly functionalities keep up with today's active lifestyles.
The life-cycle of health and wellbeing

Working life

Taking care of the worker

Occupational healthcare services required by law are comprehensive and focus on prevention of health problems caused by working conditions or leading to diminished working capacity. Employers are obliged to arrange preventive care for their employees, and can, if deemed necessary, organise curative services. The Social Insurance Institution reimburses the employer for 50 percent of all necessary healthcare costs. Ordinarily healthcare services provided by companies focus on prevention of health problems caused by working conditions or performing safety in production plants in South America, why not copy that in Finland?'

Järvinen, Metso’s company physician, explains.

Metso’s healthcare services rely on in-house specialists – the company feels that internal healthcare experts will have the most insight into the needs of the employees.

Dear Wellness Diary

It is common for working-age citizens to suffer from lifestyle-related health problems caused by working conditions and a decline in productivity, which in turn result in high expenses to society.

For instance, 60 percent of the participants believed that mobile wellness devices and applications can motivate them toward a healthier lifestyle.

Wellness Diary and Step Counter are available as a free download from Nokia Betalabs: www.nokia.com/betalabs/wellnessdiary and www.nokia.com/betalabs/stepcounter, respectively.

Down-to-earth at Metso

Engineering and Technology Corporation Metso is shifting from traditional market areas in Europe and North America to emerging areas, such as Asia, South America and Eastern Europe.

At the moment one-third of Metso’s 27,000 employees are based in Finland. Our occupational healthcare system is based on local Finnish practices, built over the course of 20 years and has a very down-to-earth approach. We focus on proactive care and optimisation of working conditions in all production sites,” says Metso’s company physician, Petrika Järvinen.

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"We are strong believers in knowledge management. Our investments in occupational healthcare are significant, and our healthcare staff is trained to practice knowledge management. Everyday contacts between employees and care providers are important, more so than any flashy wellbeing campaigns."

Every Metso employee meets four to five times a year with a company nurse or doctor. The grass roots level, anticipatory work is important: occupational accidents can be prevented if employees, healthcare specialists and occupational safety representatives have open lines of communication.

"We participate in numerous research projects a year, focusing on studies that help us improve our working conditions and operational environment. Also, it’s important to note that best practices can be shared multi-directionally. If there’s a solid, functional way of improving safety in production plants in South America, why not copy that in Finland?"

"Our goal in this project is to find how information and communication technology (ICT) helps or hinders people in their wellbeing efforts. For instance, some people love fiddling with Web-based services, online diaries and mobile phones, whereas others find that pressing buttons to enter information is too trying. The NUADU project targets people who are in the working life and at the moment healthy. The City of Espoo pilot comprises 360 test subjects divided into three groups. By collecting their experiences we hope to integrate different technologies so that interoperability raises to an appropriate level," says Jukka Salmi, research leader at Nokia.

"The users have given positive feedback. For instance, 8 percent of the participants believed that mobile wellness devices and applications can motivate them towards a healthier lifestyle."

In the future the Wellness Diary and related applications could help form the architecture for a so-called Personal Health Record, which would comprise health-related information covering the person’s entire life from birth to old age.

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Entertaining healthy habits

HEALTH EDUCATION SHOULD BE FUN, INTERACTIVE AND MOTIVATIONAL.
AT THE SAME TIME, IT MUST BE BASED ON CREDIBLE MEDICAL DATA. THIS
COMBINATION WAS SUCCESSFULLY CREATED BY THE FINNISH MEDICAL
SOCIETY DUODECIM, A 25,000-MEMBER SCIENTIFIC SOCIETY.

Together with its collaboration partners, Duodecim produced a TV
programme, a book and a Web-based game, which all had the same
goal: to get readers, viewers and Web surfers to realise that everyday
choices will prolong or shorten life.

The problem with traditional health awareness campaigns is that
people often find it overbearing and distant from their everyday life.
You tend to choose whatever brings pleasure and a sense of com-
fort, and that’s a basic trait of human psychology. So this time we
approached the issue of health and wellbeing from a viewpoint that
focuses on the ‘feel-good’ factor,” says Pekka Mustonen, CEO of Duo-
decim Medical Publications.

In 2007 the National Broadcasting Company premiered a show
titled ‘Elämä Pelissä’ (‘Gaming for Life’), in which celebrity partici-
pants took a health survey predicting their life expectancy.

The Web-based test, courtesy of Duodecim, was based on the materials
and prospective population surveys (Finrisk) conducted by the National
Public Health Institute over the past 25 years.

“The TV show offered health infor-
mation in the guise of entertainment
and made viewers curious to access
the Web-based game,” Mustonen ex-
plains. For those on the
lookout for traditional
reading material, the mul-
timedia project offered a motivational book with practi-
cal tips.

For the past four years Duodecim has actively developed an
EBM iDS service (Evidence-Based Medicine electronic Decision Sup-
pport), which is an automatic decision support module for medical
professionals.

The solution combines medical knowledge with individual pa-

tient data. Patient-specific guidance and reminders are provided for
physicians and other healthcare professionals.

Patient and doctor
as equals

THE CITY OF OULU IN NORTHERN FINLAND IS AN IMPORTANT TECHNO-
LOGY HUB, PROVIDING COLLABORATION OPPORTUNITIES TO LOCAL, NA-
TIONAL AND INTERNATIONAL STAKEHOLDERS. IN 2008, HEALTHCARE ICT
COMPANY MAWELL, THE CITY OF OULU AND A GROUP OF PRIVATE AND
PUBLIC ORGANISATIONS DEVELOPED AN INTERACTIVE INTERNET SERV-
ICE THROUGH WHICH CITIZENS CAN ACCESS RELIABLE INFORMATION, CONTAC-
T HEALTHCARE SPECIALISTS AND KEEP TRACK OF THEIR PERSONAL WELLBEING DATA.

The Mawell S7 service concept is a plug-and-play solution,
which easily links to services from external suppliers as well. “We’re
moving towards a total solution of e-care, in which the traditional
doctor-patient roles are becoming more equal. Both have access
to selected Internet-based folders, in which the patient’s personal
information is stored. Moreover, the patient can use the portal to look
for self-care advice from proven sources and in general becomes
more active than reactive,” explains Anne Niska, director of the Oulu
Self-Care project.

The cost-effectiveness of the project will be determined within the next five years.
Assisted self-care helps balance the re-
source shortages among healthcare provid-
ers, cuts down the volume of general practitioner and specialist
visits by patients, and helps the individuals make healthier life-
style choices.
Coping with chronic conditions

According to studies conducted by Finland’s Ministry of Social Affairs and Health, the state of the population’s health as a whole has mainly improved. However, the Finnish population has a genetic predisposition towards cardiovascular diseases, and lifestyle-related problems, such as obesity and Type 2 diabetes are fairly common. To maintain a sound lifestyle and wellbeing, the roles of patients and caregivers are evolving. Nowadays the treatment balance and prevent deterioration of health in chronically ill patients, need for immediate care.

The Pirkanmaa HD area comprises health centres and regional hospitals, which work in close cooperation with the Tampere Heart Centre. These units cannot provide high-level cardiac care, but in acute cardiac problems, the staff members need to make prompt decisions.

The help of VTT’s Senior Research Scientist Jaakko Lähteenmäki headed the project launched in 2006. The technology for the ‘Information and Communications Technology – A Global Solution’ endeavour is based on VTT’s Personal Information Repository (PIR) and provides a distributed solution for exchanging confidential information.

Health coach comes to the rescue

HOW TO CONVINCE A 40-SOMETHING MAN WITH TYPE 2 DIABETES, NO TASTE FOR VEGETABLES AND EXERCISE TO CHANGE HIS WAYS?

Pfizer Oy and Päijät-Häme hospital district in Southern Finland set up a self-care project, in which the ‘hopeless’ patient with chronic and costly conditions receives health and wellbeing coaching from a personal health coach.

The health coach, who typically is an experienced nurse, keeps close contact with the trainee via telephone calls, which complement traditional visits to the doctor. This model has been in successful use in the UK, for instance, and the results showed an improvement in the customers’ general health, and visits to GPs and specialists have decreased,” says Mikko Vasama, strategic development director at Pfizer Finland.

The two-year project launched in 2007 covers 1,500 citizens, and comprises in addition to traditional care - visits to primary healthcare provider, medication – regular over-the-phone discussions between the coach and the customer. The idea is gently to guide patients into a more proactive and independent mode the health coaches are using behavioral models to motivate the customer to adopt healthier lifestyles.

Markers such as blood pressure and blood sugar levels are monitored, and the coach gives practical suggestions and advice to help the patient change possible harmful habits and attitudes.

Vasama says that Finland was selected as the next test market for the Pfizer solution for a number of reasons: the size of the population and target group was ideal, back-up and commitment by the cooperation partners solid and the level of ‘IT-savyness’ of the people high.

The results are expected to emerge within the next five years. The first step is that the project participants become aware of their lifestyle and understand that healthy choices bring increased wellbeing. As this awareness grows, active health-promotion measures take place: it’s easier to stop smoking or lose weight and visits to GPs and specialists diminish. The actual cost-savings occur at this stage.

“We upgraded the PIR solution with an ECG management interface (EMI), which allowed the quick, Internet-based exchange of critical patient data, such as ECGs and patient background information, between the health units and the Heart Centre. Based on the consultation, patients needing specialized care could be sent to the Heart Centre, while others received appropriate care at the remote unit,” Lähteenmäki says.

The results achieved in 2007 were promising: in the consultation cases, cardiology diagnostics and medication could be refined and guidance for patient logistics was provided. Building on the positive results, a company called TeleKardia Oy was established to provide commercial consultation services.

The PIR-EMI solution has various future applications, one of which is home care.

“For example, patients with a manageable, chronic heart condition can benefit from remote measurements and guidance. So we’re talking about a solution that benefits both healthcare providers and patients,” Lähteenmäki adds.

From a technology perspective, the telecardiology solution is unique in many ways: it works on an interoperability basis, involving open interfaces and allowing integration of information flows from one device and system to another. Also, as an Internet-based solution its flexibility trumps that of the more traditional systems utilizing analogue transmission.

Cardiology in a virtual setting?

HIGHLY SPECIALISED UNITS FOR CARDIAC CARE CAN IN THE FUTURE SHARE KNOW-HOW AND ADVICE BY MEANS OF TELEMEDICINE. TELEMEDICINE REFERS TO REMOTE DIAGNOSTICS OR MEDICAL CONSULTANCY WITH THE HELP OF TELECOMMUNICATIONS TECHNOLOGY.

In Finland, the VTT Technical Research Centre and the Heart Centre of Pukkamies Hospital District (HD) joined forces in the ICT Health project aiming at speedy, cost-efficient and safe assessment of cardiac patients’ need for immediate care.

The Pukkamies HD area comprises health centres and regional hospitals, which work in close cooperation with the Tampere Heart Centre. These units cannot provide high-level cardiac care, but in acute cardiac problems, the staff members need to make prompt decisions.

VTT’s Senior Research Scientist Jaakko Lähteenmäki headed the project launched in 2006. The technology for the ‘Information and Communications Technology – A Global Solution’ of the PIR-EMI solution has various future applications, one of which is home care.

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When critical care is needed

Technology improves the quality and profitability of healthcare services when operating models are simultaneously developed in an innovative way. More streamlined treatment chains will lead to decreased waiting times, more effective and personalized treatment, as well as savings in resources and costs.

In Finland, the primary care services provided by municipality-run health centres cover 95 percent of all patient needs, with referrals for specialised care services accounting for the remaining 5 percent. This speaks of the efficiency and coverage of the health centres, which are the care units closest and most well known to the citizens.

Patients as project managers

“Changes are already visible. For instance in the cardiology clinic the admittance and discharge of patients is smoother, with less paperwork and a better dialogue with primary healthcare experts.” says MD Markku Makkonen, specialist in cardiology and internal medicine.

The Ideal Hospital will be run based on knowledge management. This means measuring and assessing the way in which it as a whole works, then finding a consensus on what activities the indicators require, and then sharing the wisdom of clinical specialists from logistics to maintenance,” says MD Markku Mäki-Järvi, specialist in cardiology and internal medicine.

"Changes are already visible. For instance in the cardiology clinic the admittance and discharge of patients is smoother, with less paperwork and a better dialogue with primary healthcare experts. The patients have a better understanding about their care process and are more motivated to take an active hand in their wellbeing after in-patient treatment."

The Ideal Hospital project launched in 2006 comprised five sub-areas ranging from integration of treatment processes to a patient's selfcare environment. A core team of six HUS professionals worked with 300 internal and external collaborators and launched more than 50 simultaneously progressing, targeted development projects.

In Finland, the primary care services provided by municipality-run health centres cover 95 percent of all patient needs, with referrals for specialised care services accounting for the remaining 5 percent. This speaks of the efficiency and coverage of the health centres, which are the care units closest and most well known to the citizens.

Patients as project managers

WHAT DOES THE FUTURE OF SPECIALISED CARE IN FINLAND LOOK LIKE IN 2020? THE HOSPITAL DISTRICT OF HELSINGIN AND LUISSAMA (HUS) TOOK A GIANT STEP IN RAMPING OUT THE OPERATIONAL AND IDEOLOGICAL GUIDELINES FOR FUNCTIONAL, COST-EFFICIENT AND HUMAN SPECIALIZED HEALTHCARE. The Ideal Hospital project launched in 2006 comprised five sub-areas ranging from integration of treatment processes to a patient's selfcare environment. A core team of six HUS professionals worked with 300 internal and external collaborators and launched more than 50 simultaneously progressing, targeted development projects. The idea was to harness the expertise of administrators, support services, physicians, nurses, IT specialists - and pretty much everybody in our 2,000-person organisation - and use it to create a shared view of the future. One of the most innovative aspects of the endeavour was how to draw people in, keep them motivated and turn this shared interest into viable business models and flexible, patient-driven treatment chains,” says Project Coordinator Kirsti Käpyaho. Traditionally large healthcare districts have numerous care units with individual IT systems and treatment protocols. The various links in the chain possess an enormous amount of expertise, patient data and best practices, but these are seldom shared.

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Imagine a medium-sized American hospital: a high-rising building with 10 floors, 300 beds and a staff of hundreds. Each hospital bed is equipped, as the need arises, with 10 to 15 mobile care devices such as IV pumps, heart monitors and crash carts.

In the everyday hustle and bustle of a big hospital, equipment can easily be lost or misplaced, and valuable man hours are wasted trying to keep track of them. An infrared sensor- or RFID-based location system can help, but requires additional investments in the surrounding infrastructure.

Why not use a real-time location system RTLS based on a Wireless Local Area Network (WLAN)? Finnish wireless enterprise solution company Ekahau did just that.

“In the beginning we used our solution for mobile phone tracking, but in that area GPS technology became dominant. So we decided to focus on the corporate market, and in 2002, we had our first commercial solution. At the time WLAN based location tracking was a disruptive technology,” says Antti Korhonen, Ekahau’s president and CEO.

The healthcare market, with large hospitals at its core, forms Ekahau’s primary customer base. With an average of 3,000 to 4,000 mobile care devices per hospital, the location and tracking system running on Wi-Fi can mean significant savings.

Ekahau’s Headquarters are located in the Silicon Valley, close to its biggest customers. However, R&D functions are strategically positioned in Finland.

“The Finnish wireless expertise is of extremely high caliber. When it comes to creating complex wireless enterprise solutions, it makes good sense to keep R&D under the same roof and close to skilled collaborators,” notes Korhonen.

Right time, right place, right tools

Sampling with safety

Traditionally the treatment for a heart attack – or myocardial infarction – is diagnosed based on chest pain and ECG results.

As heart conditions can be life-threatening, doctors and ER professionals have to move fast. At the same time they have to decide whether the patient in question needs instant critical care or should be placed in observation.

“Our goal is to provide caregivers with a simple, quick and reliable method for assessing critical heart and blood-vascular symptoms. Instead of using just the physical symptoms and the ECG results as basis for decision, we add blood sample analyses to the mix,” explains Harri Takalo, R&D director at Innotrac Diagnostics.

Innotrac specializes in developing fast diagnostics methods for critical heart and circulatory disorders. The Danish Radiometer-owned company concentrates its chemistry R&D and production operations in Finland, and offers hospital laboratory professionals, clinicians and nurses immunosassay point-of-care systems. The AQT90 FLEX™ immunoassay system consists of an immunoanalyzer and a comprehensive cardiac test panel. Quantitative results are available in 18 minutes, from whole blood, plasma or serum samples.

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“Innotrac’s expertise draws on dry chemistry: the needed reagents, including labeled antibody, capture antibody and stabilizing reagents are dry-coated into assay-specific cups. This eliminates the need for liquid handling, and simplifies use and storage of the reagents.

“We’re now developing new analytes that complement the existing diagnostics systems and help detect thrombosis. The AQT system also makes use of a more streamlined method of analyzing the sample, which further decreases the risk of contamination. For instance, ER nurses can perform the sampling safely, which saves time and resources,” concludes Takalo.
Home and community care during golden years

The first large post-war generation is now entering old age. The share of citizens over 75 is growing, and the goal of the healthcare service providers and decisionmakers is to help the elderly to lead an independent, well-balanced life at home. To achieve this goal, the availability of easy-to-use technology, the flexibility of urban infrastructure and architecture, and the role of social and health services are all crucial.

As the effects of chronic conditions are especially clear in the aging population, the need of supported care and rehabilitation in healthcare services is increasing. Quality of life is among the most important drivers in all efforts directed at elderly care. The roots of good life are in sound physical and muscular fitness, tight social networks, access to culture and leisure time activities. The key here – in addition to prevention – is keeping the elderly fit and active, which in its turn supports independent living at home.

AinoActive is a total service concept designed to boost a person’s fitness for work. The solution comprises a health checkup, guidance provided by a health and wellbeing specialist and a personal, web-based health folder.

“The idea is that the user – both the employee and his or her organization – benefit from the personalized, preventive care. This way we can, for instance, pick up early symptoms that later on can lead to chronic conditions such as cardiovascular diseases,” says Jyrki Eklund, managing director of AinoActive.

The “average” working man or woman without any specific health risks can use the AinoActive health promotion concept to stay fit and store wellbeing-related data, but the solution can be taken to another level, as well.

“Working ability is greatly affected by chronic conditions, such as diabetes, vascular diseases and diminished functionality of the back, neck and joints. As an intervention tool we offer organizations and their employees an integrated solution, which combines institutional rehabilitation and self-care,” Eklund adds.

“Technology with a good heart

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“We wanted to create an ambulatory rehabilitation method, and needed a collaboration partner with top-of-the-class expertise in cardiovascular and respiratory disease treatment. That’s when Corus-Fit came into the picture.”

“We had part of the technology and resources, Corus-Fit the cardiology expertise and real-time monitoring technology. Together we could produce a winning formula, and now we’re in the middle of expanding our rehabilitation solution to new markets such as Asia.”

“The key is longevity – the average AinoActive fitness project lasts about 18 months and helps the users to gain visible results. Those who need intervention will be directed to planned and supervised exercise training, such as cardiac coaching. After the training people will be in such a good physical condition that they can progress to the self-care path,” Eklund concludes.

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Building safe havens

SAFE AND COMFORTABLE LIVING ARRANGEMENTS ARE AN IMPORTANT PART OF HAPPY GOLDEN YEARS: DESIGNING AND RENOVATING HOMES, HOSPITALS AND SERVICE CENTRES TO FIT THE NEEDS OF THE AGING POPULATION IS A PRIORITY.

Architect Hennu Kjisik says that when creating comfortable and viable surroundings for the elderly, one could follow the example set by ancient Greeks.

"Care facilities and nursing homes have in the past been cut off from the urban centres. Fortunately, things are changing. To create even better living solutions and functional building complexes, we need the input of talented young architects and designers," says Kjisik.

In Kjisik & Harris’ winsome ‘Healthcare 2025’ design, the idea was to create a community hospital located in the very heart of the city – as in ancient Greece.

"The role of culture, services, companionship, hobbies and activities is crucial in rehabilitation and caring for the elderly. The modern hospital would be like a city unto itself, with ample services and traffic connections. The building would house various units that could cater to the needs of both ‘go-gos’, ‘slow-gos’ and ‘no-gos’," Kjisik illustrates.

The Vivago Watch is worn by over 30,000 people in Europe. The device, which looks just like a high-fashion watch, is actually a small, personal wellness and security system.

The Watch monitors a person’s activity level based on a sophisticated system of sensors and algorithms. Activity monitoring is used to follow-up changes in the user’s health condition and can be applied to generating different alarms and notifications.

"The Vivago Watch is aimed at chronically ill patients and elderly people living either at home or in care institutions. We wanted to create a solution which can solve three important issues: first of all, it should feature an automatic alarm system, which kicks into action if the user falls down and can’t get up. Secondly, the device is a major investment in preventive telecare. And thirdly, the Watch is an important contributor to the overall, continuous improvement of the user’s wellbeing,” explains Aage Moustgaard, Vivago’s managing director.

All traditional security bracelets work manually, and require the user to actively send an alarm by pushing a button. Also, often the bracelets are misplaced or not worn at all, which makes monitoring the patient’s wellbeing impossible. The Vivago Watch, on the other hand, informs the caregivers whether or not it is in use.
Finland is making important strides in renewing the structures, roles and methods relevant to healthcare. Known for its know-how in high technology and as a nation guaranteeing health and wellbeing services to all residents, Finland is among the forerunners of innovative healthcare. Cutting-edge competencies in wireless solutions and infrastructure are Finland’s strengths in both national and international R&D endeavours.

Finland is among the top three innovation hot spots in Europe. Thanks to the collaboration efforts between Finnish research institutes, universities, corporations, national funding agencies, ministries and municipal authorities, the public-private partnership is the guiding principle in healthcare development.

For instance the FinnWell funding programme by Tekes, at a total budget of MEUR 170, gathers partners from high-tech hospitals, wireless and ITC expert companies, industrial engineering, healthcare service process specialist and naturally, citizens as part of pilot and end user testing.

Another Tekes-run programme, Innovations in Social and Healthcare Services, focuses on funding systemic innovations in social and healthcare. The programme was launched in 2008 and continues through 2015. The total value of the programme is MEUR 240.

The Tekes programmes foster cooperation between public, private and non-profit sectors such as patients’ organisations and other non-governmental organisations. Tekes’ goal is to help these parties to create new partnership models, which in their turn translate into nationwide, exportable healthcare solutions.

Tekes’ comprehensive renewal work is supported by the Ministry of Social Affairs and Health and other governmental and public-law subjected partners. The strong administrative backbone enables easy and non-bureaucratic sharing of expertise both nationally and internationally.
The Finnish healthcare system is one of the most effective and functional in the world and efforts are underway to make it even better. Businesses, research groups and public authorities such as ministries and funding organisations in Finland are cooperating closely to improve future healthcare services.

The Finnish healthcare community welcomes international players to join the innovation network to find new solutions to common challenges. Tekes is one of the gateways to the key healthcare players in Finland.

**Tekes, the Finnish Funding Agency for Technology and Innovation**

Tekes is the main public funding organisation for research and development (R&D) in Finland. Tekes funds industrial projects, as well as projects in research organisations, and especially promotes innovative, risk-intensive projects.

**Tekes programmes – part of the innovation chain**

Tekes programmes are an essential part of the Finnish innovation system. The programmes have proved to be an effective form of cooperation and networking for companies, universities and research institutes for developing innovative products, processes and services. Tekes programmes boost development in specific sectors of technology or industry, and the results of the research work are passed on to business systematically. The programmes also serve as excellent frameworks for international R&D cooperation.

**Further information**

[www.tekes.fi](http://www.tekes.fi)

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