

**Developing Information Society**  
**Seminar on global perspectives of development communication**  
**University of Tampere, 28 June 2004**

**Olli Hietanen**  
**Regional Manager**  
**Finland Futures Research Centre**  
**Turku School of Economics and Business Administration**  
[Olli.Hietanen@tukkk.fi](mailto:Olli.Hietanen@tukkk.fi)  
[www.tukkk.fi/tutu/](http://www.tukkk.fi/tutu/)

**GLOBAL CHALLENGES OF eDEVELOPMENT**  
**- FROM DIGITAL DIVIDES TOWARDS EMPOWERMENT AND**  
**SUSTAINABLE GLOBAL INFORMATION SOCIETY**

*The Global Challenges of eDevelopment* (2003 – 2005) project aims to study a variety of cultural and social aspects in the development of the democratic and sustainable uses of ICT in developing countries, as well as, co-operation between developed and developing countries. Its main objective is to identify joint practices and interaction over the existing digital divides. One purpose is also to systematically monitor the social, cultural and economic consequences of the ongoing ICT revolution in today's developing countries.<sup>1</sup>

**1. The Digital Balance Between Industrialized and Developing Countries – A Case Study: The Development of an Information Society on the African Continent**

Finland Futures Research Centre participates in this research with a pilot project called *The Digital Balance Between Industrialized and Developing Countries – A Case Study: The Development of an Information Society on the African Continent*.<sup>2</sup> The purpose of this research is to discover how ICT technology, content and e-services developed in Finland will work on the African continent – and vice versa. The aim of this study is to gain experience of the characteristics unique to African countries in developing an information society. There are five stages in this study:

- The first stage is to identify potential best practice technologies, contents and e-services here in Finland.
- The second stage is to identify the most important needs of African continent and get better understanding of the unique characteristics of the African continent's Information Society development.
- The third stage is to involve several African partners in taking an active role in the development of their own information society through this pilot project.

---

<sup>1</sup> See also <http://www.globaledevelopment.org>

<sup>2</sup> See also <http://www.tukkk.fi/tutu/gisdeve/>

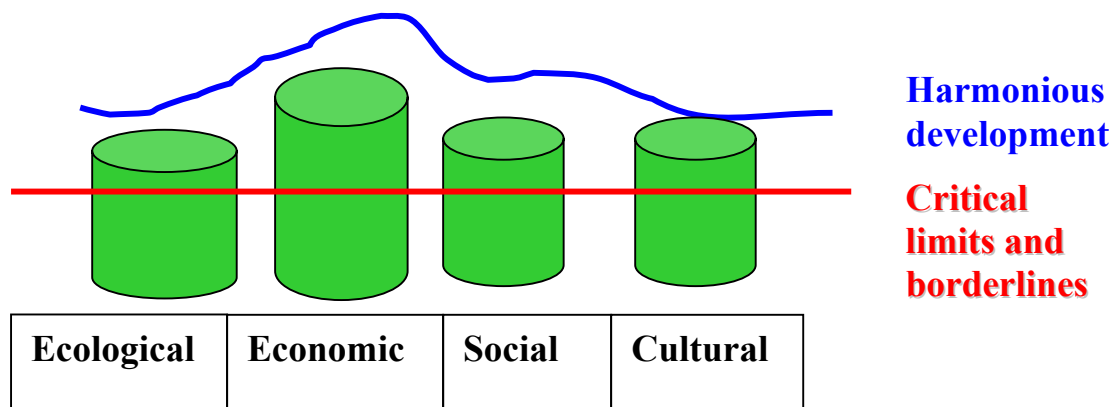
- The fourth stage is to identify potential best practice technologies, contents and services in the continent of Africa.
- The fifth and final stage is to raise new questions for those studies and development projects, which are needed in developing countries.

## 2. Looking for best practice technologies, contents and services of sustainable information society

The aim of *The Eco-Information Society: the Criteria and Operational Possibilities project (eKnowledge)*,<sup>3</sup> coordinated by FFRC (2000 – 2003), was to study ecological, cultural, social and economic criteria and their potential for aiding sustainable development in the information society.

In the eKnowledge project we first divided sustainability into four dimensions: ecological, social, cultural and economic sustainability. After this we can give a new definition that sustainability requires two things (Hietanen 2002 and Hietanen & al. 2004):

- Firstly **we should not** cross the critical limits and borderlines of ecological, cultural, social and economic systems.
- Secondly sustainability means that **we should** harmoniously combine different kinds of ecological, social, cultural and economic needs, demands and driving forces.



*Figure 1. Ecological, economic, social and cultural dimensions are equally important and it is incorrect to sacrifice one dimension for another or change one dimension for another. They must develop together and equitably.*

In the eKnowledge project this totality of sustainability is called Digital Balance. In short digital balance means, that technology, processes, decisions and so on, are not considered sustainable if they aren't sustainable in every era. They must develop together and equitably. (Ibid)

<sup>3</sup> See also <http://www.tukkk.fi/tutu/etiето/english.htm>

## 2.1. Economic sustainability

The basic principle of the economy is defined as the conduct of economic activity in a profitable way. Economic sustainability, then, means the well being of households, companies, economies and the actors and systems of the global economy. This welfare is of course affected also by factors other than just economic resources, such as the availability of raw materials, energy and for example educated labour. Also knowledge and creativity occupy an increasingly central role in the economy of the information society, or so called new economy. True digital economy means that instead of a physical flow of goods, the products or services consist of information flows transmitted through information networks. (Hietanen & al. 2004)

Core phenomenon with respect to economically sustainable development, raised in the eKnowledge reports, is an important transition process from **old economy** towards **new economy** and **digital economy**. (Ibid.)

## 2.2. Ecological sustainability

(Eco)efficiency potentials of the information society can be divided in three groups: Dematerialization, immaterialization and amaterialization. When for example a car is being manufactured, less energy and materials than before may be needed in its production. This improvement of eco-efficiency in its production can be termed dematerialization. Correspondingly, consumers can use the car more eco-efficiently by driving economically and servicing it regularly. This improvement of eco-efficiency in the car's consumption is also immaterialization. However, there is one further dimension of eco-efficiency in the information society; amaterialization. Amaterialization occurs when the motorcar and its physical movement are substituted by telepresence, e.g. diverse teleservices that can reduce the physical need to be in another place. From this point of view new information technologies and teleservices can promote ecological sustainable development. (Vehmas & al. 2003; Hietanen & al. 2004)

In digital economy GDP consists of digital bit products and/or services and products such as education, theatre, music, etc. This amaterialization is both the potential of the sustainable development of the information society and an essential competitive asset of the European information society.

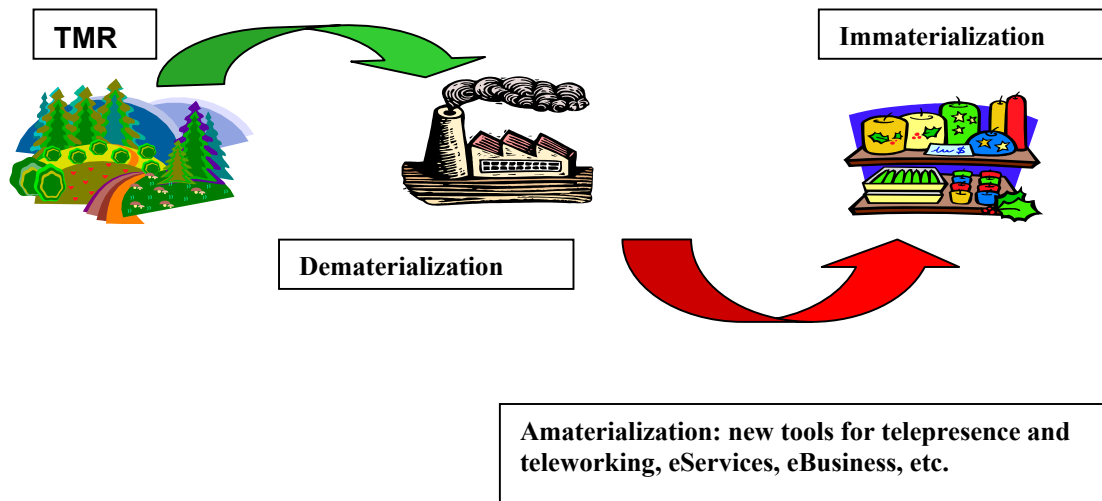


Figure 2. Eco efficiency potentials in the Information Society: Dematerialization, immaterialization and amaterialization.

### 2.3. Social sustainability

Socially sustainable development is defined as the well being of communities, groups and individuals (social actors/systems) – the functioning of communities of all kinds. Another key concept in the day-to-day interaction in communities is communication. (Hietanen & a. 2004)

Core phenomena with respect to socially sustainable development raised from the eKnowledge report are **work, health, regionality, safety, social well being, access and communality**. (Ibid.)

In the future there will be a great deal of technological diversity, which will probably lead to different kinds of tools and personally profiled content and equipment. This technological high tech will be able to help us to create sustainable futures – but if and only if the technology helps us to build better social machinery – **social high tech**. The task of **socially sustainable technology** is then to help people, cities and nations avoid and minimise inequalities and digital divides. In the future better decision-making and planning processes, better information, better education systems, new technological innovations are needed to help in this **social task**. Technology is a tool, not the target. In practice this means new types of social innovations such as telework, immaterial products like e-services and new local and global markets that will be created through networking. (Hietanen 2002)

### 2.4. Cultural sustainability

The cultural sphere can conceive of as the sum of all that is human, cognitive and spiritual. Cultural sustainability means the well being of different kind of cultural systems. (Hietanen & al. 2004)

Another way of approaching the sustainability of cultural development is to speak of the well-being of institutions in the areas of art, heritage and culture: how well for example schools, libraries, museums, universities, theatres, orchestras, galleries and other culturally significant institutions are doing. (Ibid.)

Core phenomena with respect to cultural sustainability raised in the eKnowledge project are **education and training, cultural institutions and services, cultural education, cross-sectorality, research, cultural production and technology, activity and participation.** (Ibid.)

## 2.5. Conclusions about best practices

If we now put together different kinds of criteria of sustainable information society we can argue, that:

1. We need digital **bit products** and **services** such as education theatre, music, etc. This amaterialization is both the potential of the ecological sustainable development of the information society and an essential competitive asset of the economic sustainable information society.
2. The task of **socially sustainable technology** is to help build better decision-making and planning processes, better information and better education and innovation systems. In practice this means new types of social innovations such as telework, tele-education, digital bit products like e-services and new local and global markets that will be created through networking.
3. Core phenomena with respect to cultural sustainability are for example education, training, cultural research and participation.

## 3. The Digital Balance Between Industrialized and Developing Countries pilot project in practice

### 3.1. Advanced Institute for Information and Communication Technology

The purpose of the AIICT Workshop in George (16.-18.2. 2003) was to give national and international input to the establishment of an Advanced Institute for ICT (AIICT).

The purpose of an Advanced Institute for ICT (AIICT) organisation is to promote co-operation between universities, industry and government on ICT learning, research, development and innovation. It will be informed by practical, needs-based challenges through effective networks and partnerships. AIICT should, amongst other goals:<sup>4</sup>

---

<sup>4</sup> Advanced Institute for Information and Communication Technology, Strategic Plan Discussion Document. Version 2.0X

1. Undertake high quality needs-based basic research in the ICT field leading to development and innovation for the benefit of South Africa and the region.
2. Develop ICT knowledge workers with internationally recognised qualifications.
3. Establish SA as a highly competent international ICT player.
4. Attract leading ICT knowledge workers from various parts of the world.
5. Be the champion, voice, parent and mentor of an emergent South African ICT industry that is regionally relevant and globally competitive.

At this seminar *The Digital Balance Between Industrialized and Developing Countries* pilot project informed AIICT and CSIR (*Council for Scientific and Industrial Research*), which was the host of the seminar, that the project can offer the AIICT e.g.

- Strategic partnership and
- Networks with Finnish industry and business, governmental organisations and national and international research institutions.

### **3.2 Participation to the World Summit on the Information Society (WSIS) - conference, Geneva 9. – 12.12. 2003**

The World Summit on the Information Society is held in two phases. The first phase of WSIS took place in Geneva hosted by the Government of Switzerland from 10 to 12 December 2003. It addressed the broad range of themes concerning the Information Society and adopted a Declaration of Principles and Plan of Action. The second phase will take place in Tunis hosted by the Government of Tunisia, from 16 to 18 November 2005.<sup>5</sup>

*The Digital Balance Between Industrialized and Developing Countries* –pilot project presented a poster and networked with African partners in WSIS –conference, Geneva 9. – 12.12. 2003.

### **3.3. Project workshop with doctor Robert (Bob) Day**

*The Digital Balance Between Industrialized and Developing Countries* –pilot project organised workshop at 10.6. 2004 with doctor Robert (Bob) Day. Dr Day's most recent formal post was with the University of South Africa (Unisa,) from 01/2000 to 04/2003 as Executive Director of ICT (member of Executive Management). His contract involved the development of ICT policy and related strategies, and co-ordination of all ICT infrastructure and applications (both academic and administrative) in support of Unisa's growth as a leading e-learning organisation. There was particular focus on the role ICT can play in providing quality, open distance learning for the most remote and/or disadvantaged communities in South Africa and the rest of Africa.

---

<sup>5</sup> See also <http://www.itu.int/wsisis/>

In June 2004 Finnish Embassy in South Africa asked Dr Bob Day to visit in Finland and meet those professional organisations in private and public sector which are playing a vital role in creation of Finnish innovation system.

During his visit doctor Day met Finnish public authorities and business community with the following, case-by-case applicable agenda (Day 2004):

- a presentation based on Dr Sibisi's and Dr Day's review of the Castells & Himanen book, emphasising what seems (from an African perspective) so exciting about the Finnish system, and what seems to be missing in Sub Saharan African Innovation.
- an in depth discussion to encourage the Finnish "innovation experts" to apply their minds to the African innovation problems we have presented, and to share their thoughts regarding missing issues, causative factors, and possible interventions (short and longer term).
- an attempt to develop schematic, representational models which capture their ideas regarding the present situation, as well as a more ideal future. These sketches will be used as inputs to one of the main deliverables of this study, ie to build more robust, testable systemic models of South Africa's (and Sub-Saharan Africa's) System of Innovation.

According to doctor Day the following meta-model appears to underlie Finland's dramatic rise to success (Ibid.):

- The fundamental driving force appears to be Finland's unique, holistic approach to the stimulation of innovation in all areas of society.
- In parallel with the emergence of this highly innovative environment, Finland has experienced several major transformations of its private sector in particular, and its economy in general, and appears to have set itself up to continue to do so.
- The Finns have discovered that it is not possible for all sections of society to develop at the same pace, nor is it healthy to try to force them all to develop in the same way. Yet they have succeeded beyond most in overcoming the urban-rural divide by aiming to include everyone in their informational society.

Such African schematic models might begin by examining the relationships (real and potential) between the following factors (Ibid.):

- Recognising the need to establish cultures (national systems?) of innovation, of future orientation, and of early adoption of technology.
- The essential establishment of environments attractive to innovative organisations, and the related need to encourage in all ways possible the development of 'leader organisations' like Nokia. This should include creating a major component of their products/services being of indigenous rather than imported origin.

- Transforming SSA's HEIs to mimic the immense impact that Finland's HEIs and R&D institutions are having: by focussing on maths, science, technology, engineering, and especially ICTs; by collaborating closely with innovative industrial entities; by playing a prominent thought leadership role; etc.
- Transforming the broader education system so that the short and long term educational needs of ALL members of African society are addressed, not the current few. Recognising that broader literacy for all, including ICT and information literacy, is an essential prerequisite for social innovation, development and the establishment of an informational society.
- Recognising the need to identify, nurture and encourage the development of individual citizen innovators ('hackers') at all levels of African society. These hackers are most likely to be found amongst the young (including young women), and come in the form of both computer and social hackers.
- Basing rural development on the concept of multiple, parallel local information societies, ie ICT-led development, even of the poorest of the poor.
- Recognising that current African cities are far from being the 'megacities' of the informational society, and therefore identifying the best processes for seeding the development of such multi-nodal concentrations of multiple excellences.
- The transformation of African public sector organisations to embrace informational concepts, distributed structures and flexible processes.
- The development of national universal welfare states as integral components of their emerging information societies, but with the associated costs always being covered by the increased productivity of the new paradigm.

The result of the project workshop with doctor Day were, that the best practice contents and e-services could be Futures Research Centre, World Futures Academy and The Society for Futures Studies. These institutions could be an important part of South African innovation and education systems:

**Futures Research Centre** is an organisation for futures research, education and development, which has operations on local, national and international level. The Centre produces and promotes visionary information on the future trends of society and the environment. With its multidisciplinary resources it is able to meet the needs of its customers, which range from academic institutions to public organisations and the business world. Extended networks of co-operation guarantee the Centre access to the latest ideas, visions and methods to deal with and evaluate perceptions of the future.<sup>6</sup>

**World Futures Academy** is an international network of the universities aimed at the academic educational and research programmes in the futures studies. The network has its basis in the extensive and multidisciplinary scope

---

<sup>6</sup> See also [www.tukkk.fi/tutu/](http://www.tukkk.fi/tutu/)

of futures studies. The forms of learning and study materials are adapted to the learning environment with the aid of information technology and interactive study methods.<sup>7</sup>

**The Society for Futures Studies** aims to influence the long-term development of society by advancing futures research and its utilization.<sup>8</sup> Efforts in promoting futures studies focus on the following objectives:

- to develop the material, organizational, and intellectual bases for futures research in Finland;
- to advance higher education grounded on futures research;
- to foster contacts among futures researchers as well as between the researchers and those who could utilize their work;
- to maintain contacts with research institutes and researchers in foreign countries;
- to communicate the latest results of futures research to the public and to emphasize the necessity of such research.

Members can be institutions and individuals. All members receive the society's journal. The magazine contains feature articles, research reports, and seminar presentations and functions as a forum for the exchange of information and opinion.

---

<sup>7</sup> See also [www.tukkk.fi/tutu/tva/](http://www.tukkk.fi/tutu/tva/)

<sup>8</sup> See also <http://www.futurasociety.fi/>

## 4. Next Steps

### 4.1. Questionnaire in Turku Science Park and Kouvola Kasarminmäki

The pilot project is carrying out a questionnaire in form of a traditional questionnaire and a diary in autumn 2004. This will give a picture of one working week in office – what type of work was done with what kind of technology support. The result of this study is a picture (table) of where, how and when materials and energy are used in an average office during an entire working week.

The case study examines the information and communication technology (ICT) cluster of south-western Finland co-ordinated by ICT Turku Ltd (Turku Science Park) and the ICT cluster in Kouvola Kasarminmäki. At the first stage the study networks will be analysed and modelled *using network and cluster analysis and soft system methodology*. This assists in defining the structure, actors and the central working processes of the networks and the structure and dynamics of those processes.

The specialised methodologies that will be used are narratives that are grouped by i) *images of the past*, ii) *images of the present* and iii) *images of the future*.

### 4.2 Cooperation between FFRC and EMPA

*The Digital Balance Between Industrialized and Developing Countries* –pilot project will cooperate with Swiss Federal Laboratories for Materials Testing and Research (EMPA/Technology and Society Unit).<sup>9</sup>

Empa is the institution for multidisciplinary research into sustainable materials and systems engineering. Empa's most important stakeholders are business and society, institutes of higher education and universities and the public authorities.

The objective of cooperation between FFRC and EMPA is to estimate the impacts of ICT-infrastructure and its consumption patterns on the eco-efficiency of ICTs and e-services. The project is divided into three sub-sections:

- 1) Eco-efficient ICT-infrastructure;
- 2) Eco-efficient e-services; and
- 3) Eco-efficiency improving consumption patterns in the ICT sector.

The project package should be manageable within 6 months and will be carried out from 1.2. till 31.9.2004.

EMPA (contact person Martin Lehmann-Chadha) is collecting information around the impact of different information technologies (phone, mobile phone, television, digital television, radio, Internet, CD-Rom, printed media). Data on the impact of different modes of mobility (e.g. the research done by EMPA on the Environmental impacts of an international conference) will also be gathered.

---

<sup>9</sup> See also <http://www.empa.ch/>

In practice this means that partners are looking for data and results concerning information technology and mobility aspects of the existing projects (e.g. IPTS, ewaste, Media project, Environmental impacts of an international conference). Olli Hietanen would then visit to EMPA in September (6. - 17. 9. 2004), in order to finish the work face to face.

Special interest could be put on a comparison between mobile and fix net:

- WLAN, Bluetooth, mobile phone
- Radio, TV, Digi TV

Another area of interest is the comparison between conventional services and e-services:

- Health centre vs. eHealth
- School vs. eLearning
- Library (printed books vs. eBooks)

#### **4.2 Cooperation between FFRC and South African partners**

Olli Hietanen will visit in CSIR in summer 2005 (about 3 – 4 months). The target of this visit is to start up Futures Research Centre, World Futures Academy and The Society for the Futures Studies in cooperation with CSIR and doctor Day. The CSIR is the premier technology and research organisation in Africa committed to innovation, supporting sustainable development and economic growth and creating value for clients, partners and stakeholders.<sup>10</sup>

Project has also made agreement with Ms. Emily Thifhelimbilu Shiruma, that she will be the projects contact person in South Africa. There she will:

1. Audit and monitor the R&D projects management methodology in F'SATIE (French Institute of South Africa for Electronics Engineering).
2. Network with the NEPAD secretariat.
3. Network with the partners of *The Digital Balance Between Industrialized and Developing Countries* –pilot project
4. Assistance Olli Hietanen in summer 2005

---

<sup>10</sup> See also <http://www.csir.co.za>

## 5. References

- Day, Robert Stephen (2004): A Tour to examine the main components and players contributing to the success of the Finnish Information Society. Unpublished paper.
- Hietanen, Olli ed. (2002): Indicators of Sustainable Development, Futura 2/2002 (149 p.). Tulevaisuuden tutkimuksen seura ry. Helsinki. Vammalan kirjapaino Oy. Also available on Internet:  
<http://www.tukkk.fi/tutu/etiето/english.htm>
- Hietanen, Olli & Heinonen, Sirkka & Kiiskilä, Kati & Lyytimäki, Jari & Rosenström, Ulla (2004): *Indicators of Sustainable Information Society*. Turun kauppakorkeakoulu, Tulevaisuuden tutkimuskeskus. Tutu-julkaisu 1/2004. Turku. Also available on Internet  
<http://www.tukkk.fi/tutu/etiето/english.htm>
- Vehmas, Jarmo & Malaska, Pentti & Luukkanen, Jyrki & Kaivo-oja, Jari & Hietanen, Olli & Vinnari, Markus & Ilvonen, Jenni (2003): *Europe in the Global Battle of Sustainability: Rebound Strikes Back? Advanced Sustainability Analysis*. Turku School of Economics and Business Administration. Series Discussion and Working Papers 7:2003. Turku. (110 p.)