

BRU

The Seoul 2.0 Model Lifelong Learning

Tom van Weert



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information technology

the
**International
Federation for
Information
Processing**



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How to be a
Agora Initiative
Lifelong Learning
on
Organisation
Lifelong Learning
SEOUL 2.0



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E-Change: Digital Life
The E-change Puzzle
Dealing with the E-change Puzzle:
Knowledge society
The learning organisation
How to be a learning organisation:
SEOUL 2.0
How to become a learning
organisation: SEOUL 2.0



1980 2007

2025





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Digital Life

International Telecommunication Union



ICT developments

Ubiquitous digital networks

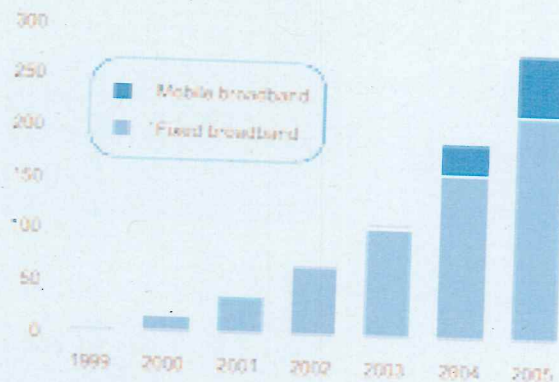
- Mobile broadband
- Portable internet
- Connected computing
 - radio-frequency identification
 - sensors & actuators
 - media convergence
- Instant messaging

Towards ubiquitous digital networks: *Broadband*

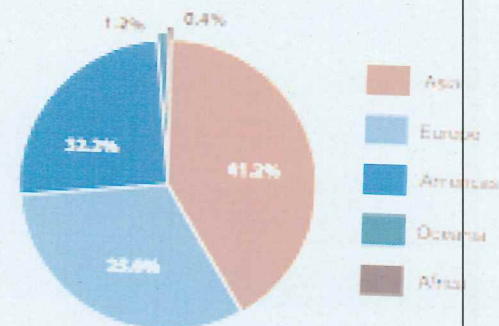
Figure 1.3: Broadening the scope

Development of broadband networks, worldwide, 1999-2005 and by region, 2006

Total broadband subscribers, worldwide, millions



Total broadband worldwide, 2006

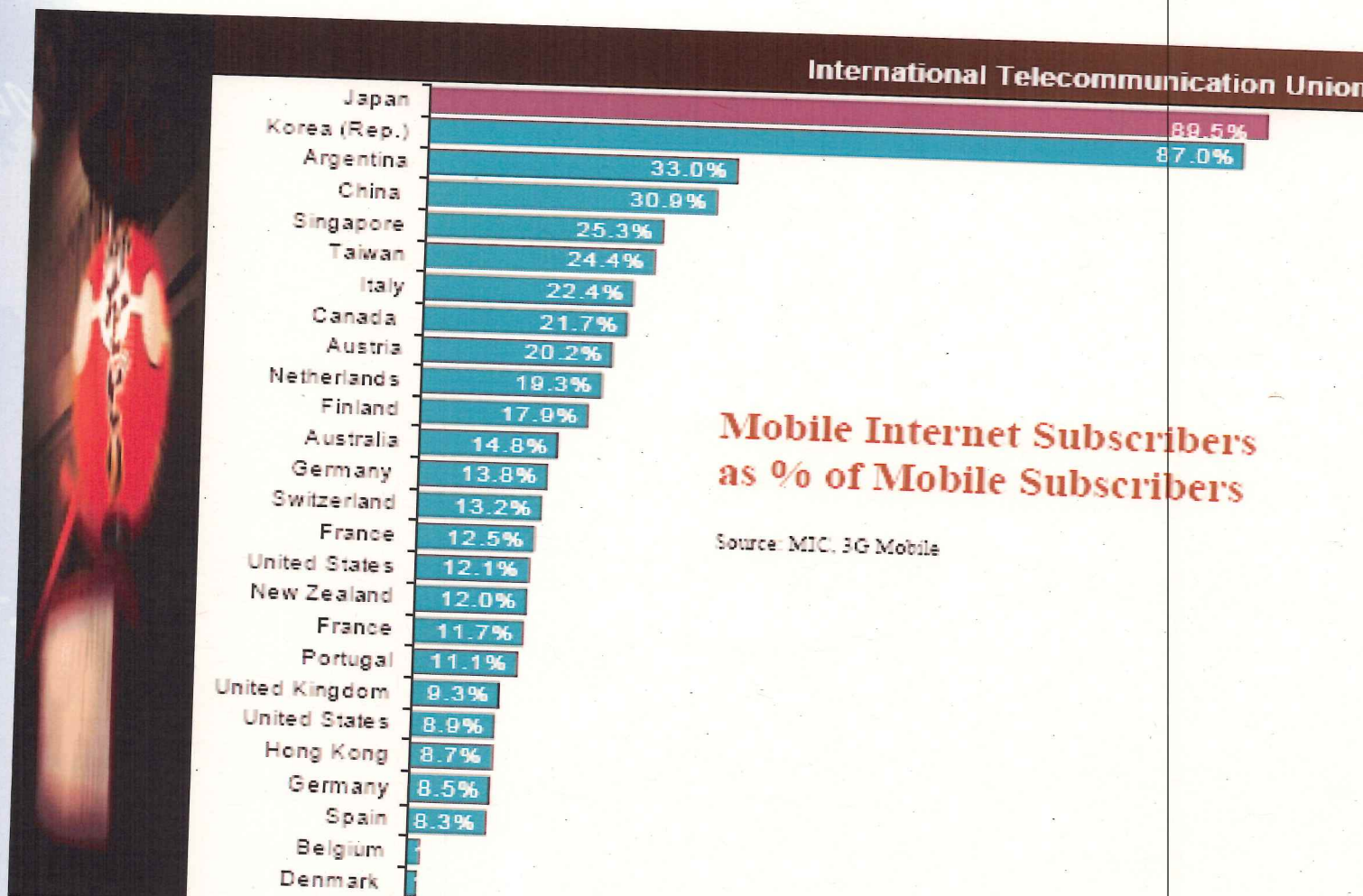


Total 2006: 277 million

Note: "Broadband" in this context means networks offering capacity equal to or greater than 256 kbit/s in one or both directions. For mobile services, this includes W-CDMA, CDMA 1x EV-DO and CDMA 1x EV-DV. For fixed-line broadband it includes DSL, cable modems, metro ethernet, fixed wireless access, fibre to the home, etc. (see Technical notes).

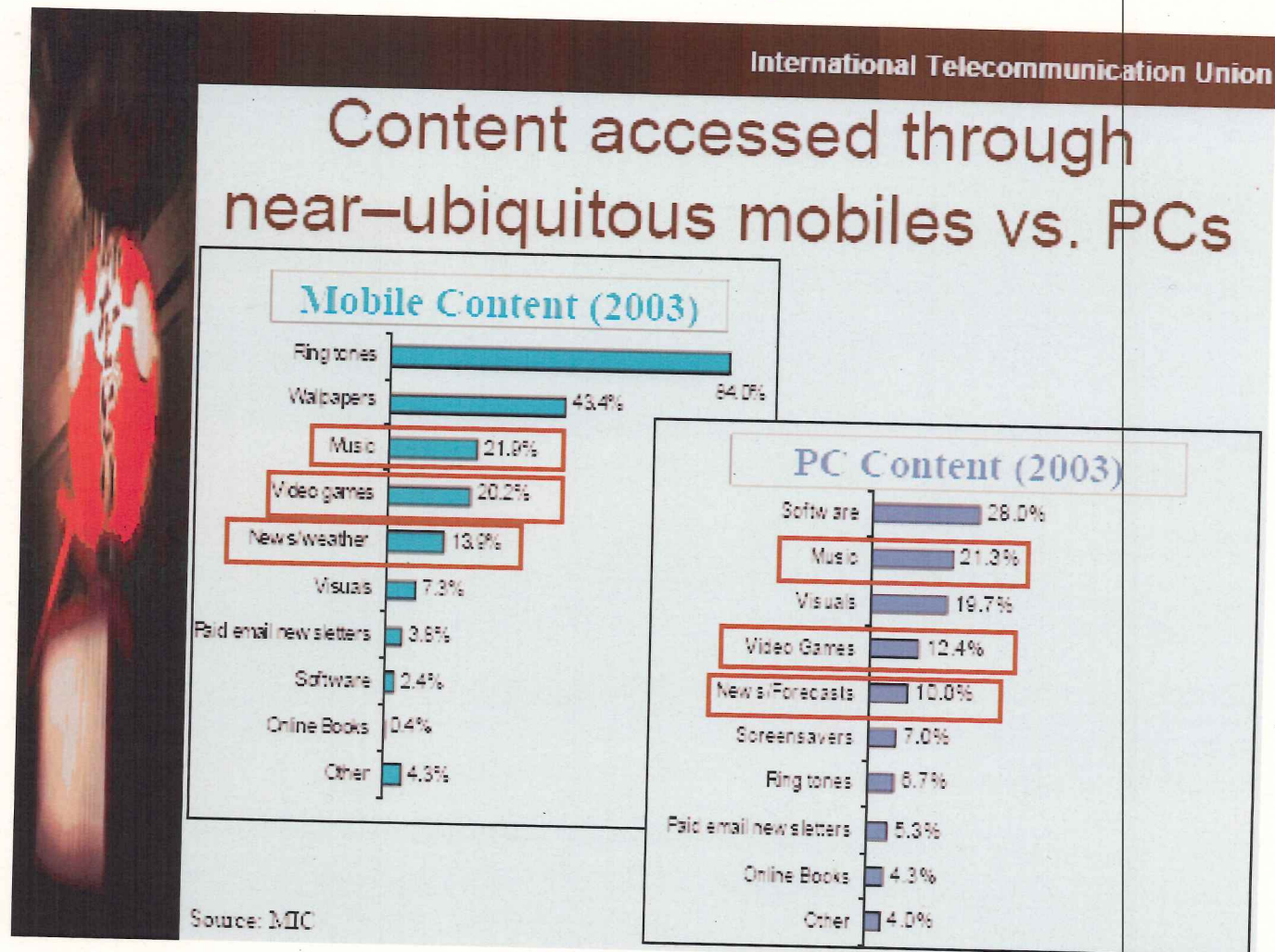
Source: ITU Information Society Statistics Database (see data tables 4 and 6)

Towards ubiquitous digital networks: *Digital mobility*



Source: Lara Srivastava Telecom Policy Analyst, Strategy and Policy Unit, ITU

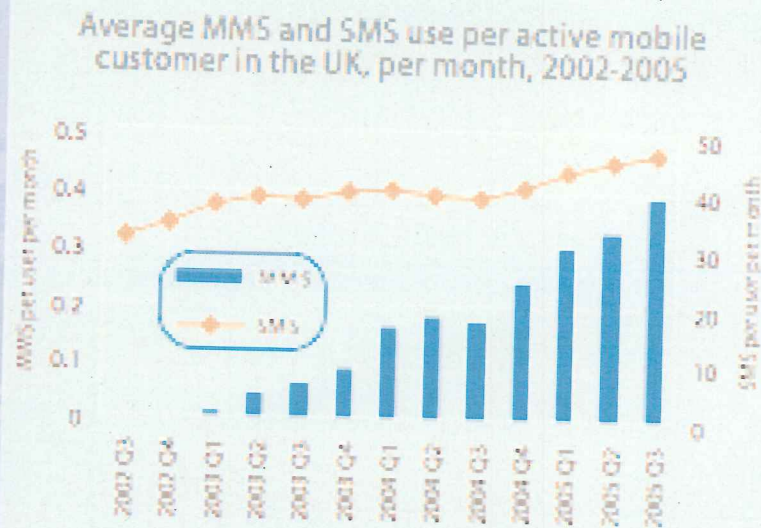
Towards ubiquitous digital networks: *Example: Japan*



Source: Lara Srivastava Telecom Policy Analyst, Strategy and Policy Unit, ITU

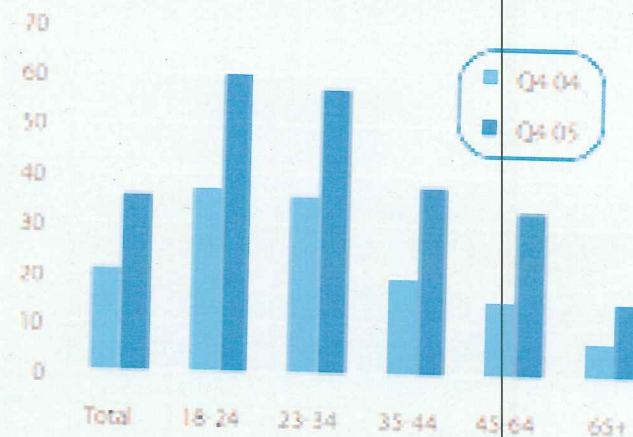
Towards ubiquitous digital networks

Example: United Kingdom



Source: Adapted from Ofcom

Sending/receiving MMS in the last three months as a % of active users by age group



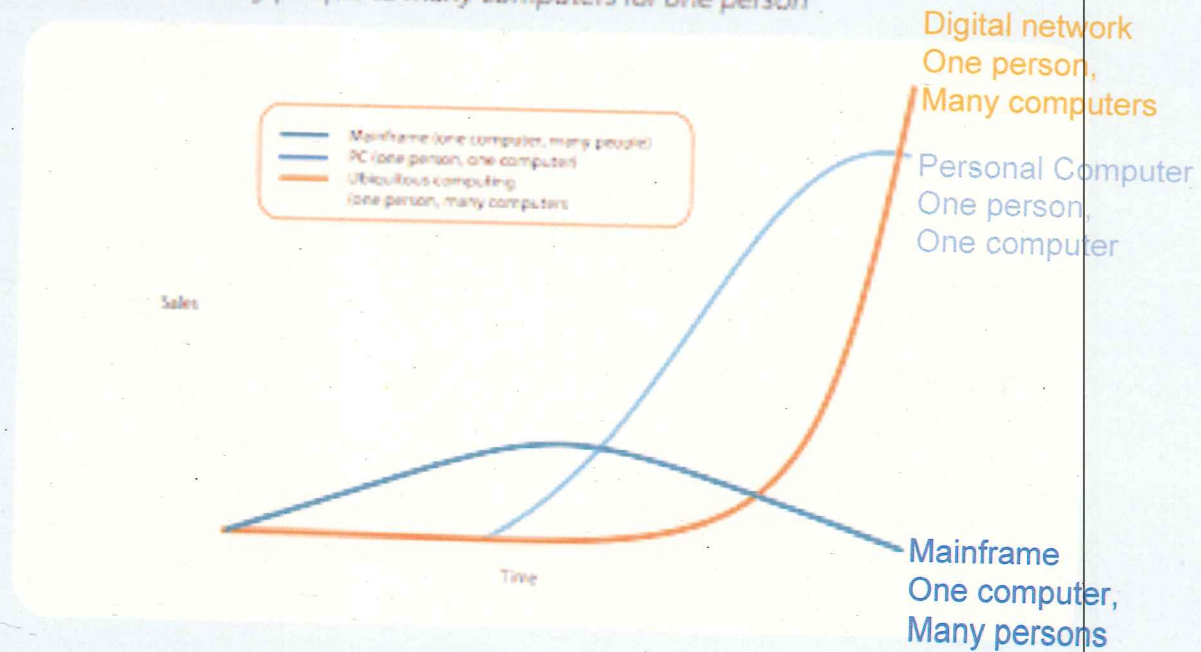
Instant messaging

Source: Digital Life, ITU Internet Report 2006

Towards ubiquitous digital networks: *One person, many computers*

Figure 1.4: The ubiquity of digital

From one computer for many people to many computers for one person.



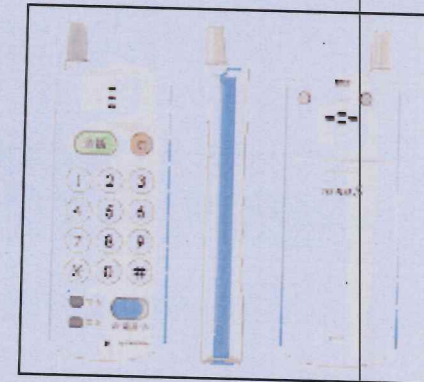
Source: Adapted from Ignas G. Niemegeers, "The Invisible Network", TU Delft, 2005

Towards ubiquitous digital networks: *User devices*

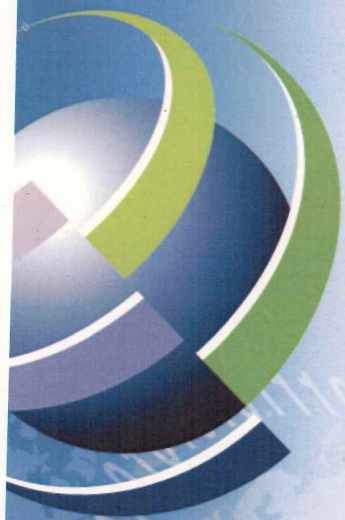
International Telecommunication Union

But ubiquity also means access
for all segments of the population

- Great demand for simple mobile handset for those not wishing/needing to use Internet or cameras
- TU-KA. KDDI's 2G arm. released this simple handset (*Tu-Ka S*) in Nov 2004.
- *Tu-Ka S* has no LCD display or users manual. and has been a smash hit for users over 60!



Source: Lara Srivastava Telecom Policy Analyst, Strategy and Policy Unit, ITU



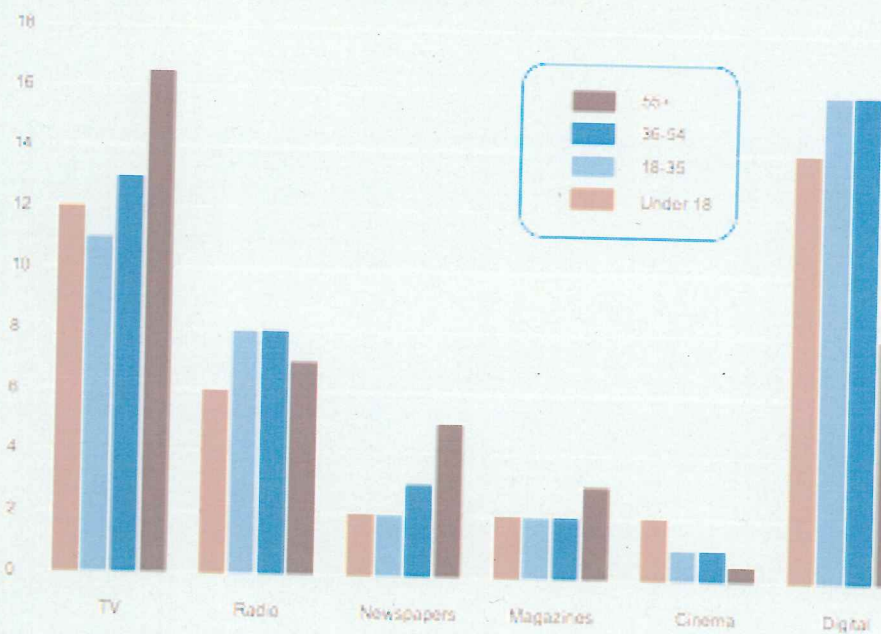
Changes in life

- Social networking
 - Messaging
 - 'Second Life'
- On-line knowledge sharing
 - The global knowledge web
 - User-generated content (WIKI)
- On-line gaming
- On-line buying
- On-line banking
-

Changes in life

Figure 1.2: Going digital

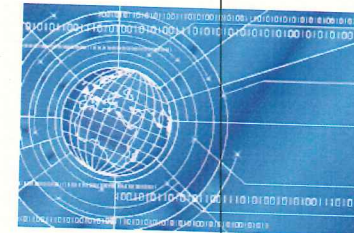
Global consumption of media during leisure time by age group (hours per week)



Source: Adapted from *Financial Times*, "Advertisers in search of revenues look to web's latest heroes", 23 August 2006, based on figures from Nielsen/Net Ratings & Credit Suisse

The 2007 e-readiness rankings Raising the bar

A white paper from the Economist Intelligence Unit



IBM
POWER TO BUSINESS

E-change

Complex, transversal, contextual

- Connectivity and technology infrastructure
- Business environment
- Social and cultural environment
- Legal environment
- Government policy and vision
- Consumer and business adoption



E-change

Complex, transversal, contextual

Issues

1. Technology evolution
2. Social impacts
3. Digital Divide – Inequity
4. Sustainable development
5. Access for all
6. Trust and Confidence
7. Privacy and Data protection
8. Misuse - Ethics



The E-change puzzle

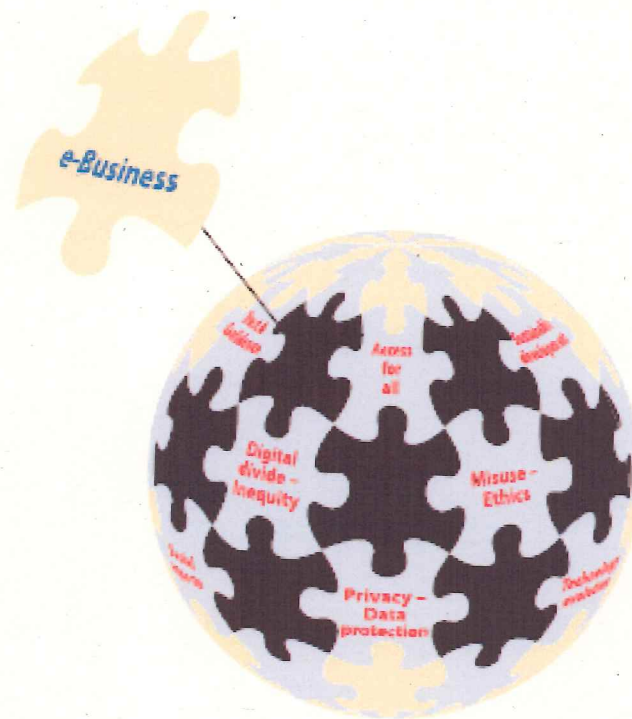
1. Technology evolution
2. Social impacts
3. Digital Divide – Inequity
4. Sustainable development
5. Access for all
6. Trust and Confidence
7. Privacy and Data protection
8. Misuse - Ethics



Source: Raymond Morel. Ministry of Education, Geneva

The E-change puzzle

A. e-Business

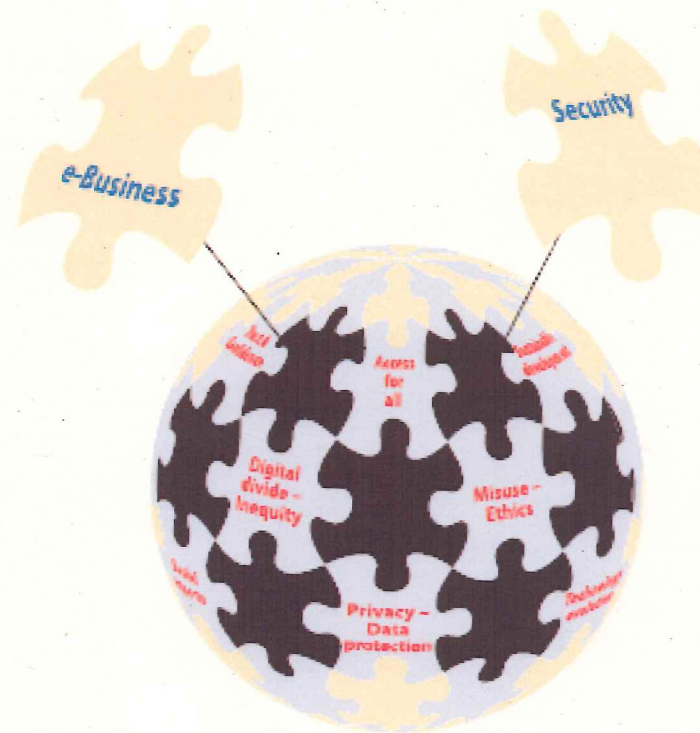


Source: Raymond Morel. Ministry of Education, Geneva



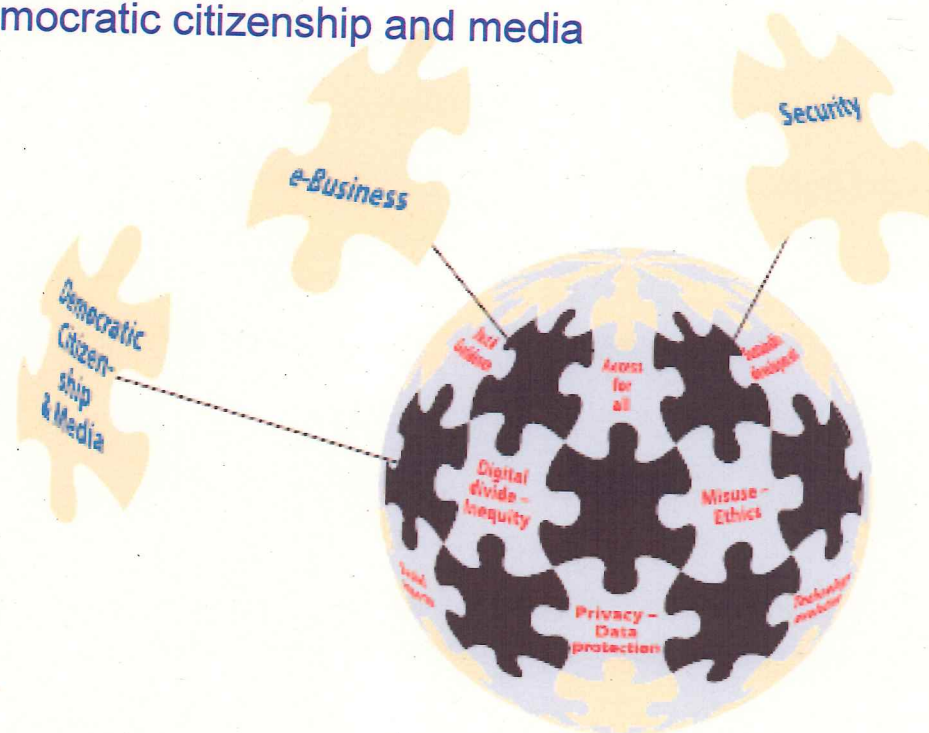
The E-change puzzle

- A. e-Business
- B. Security



The E-change puzzle

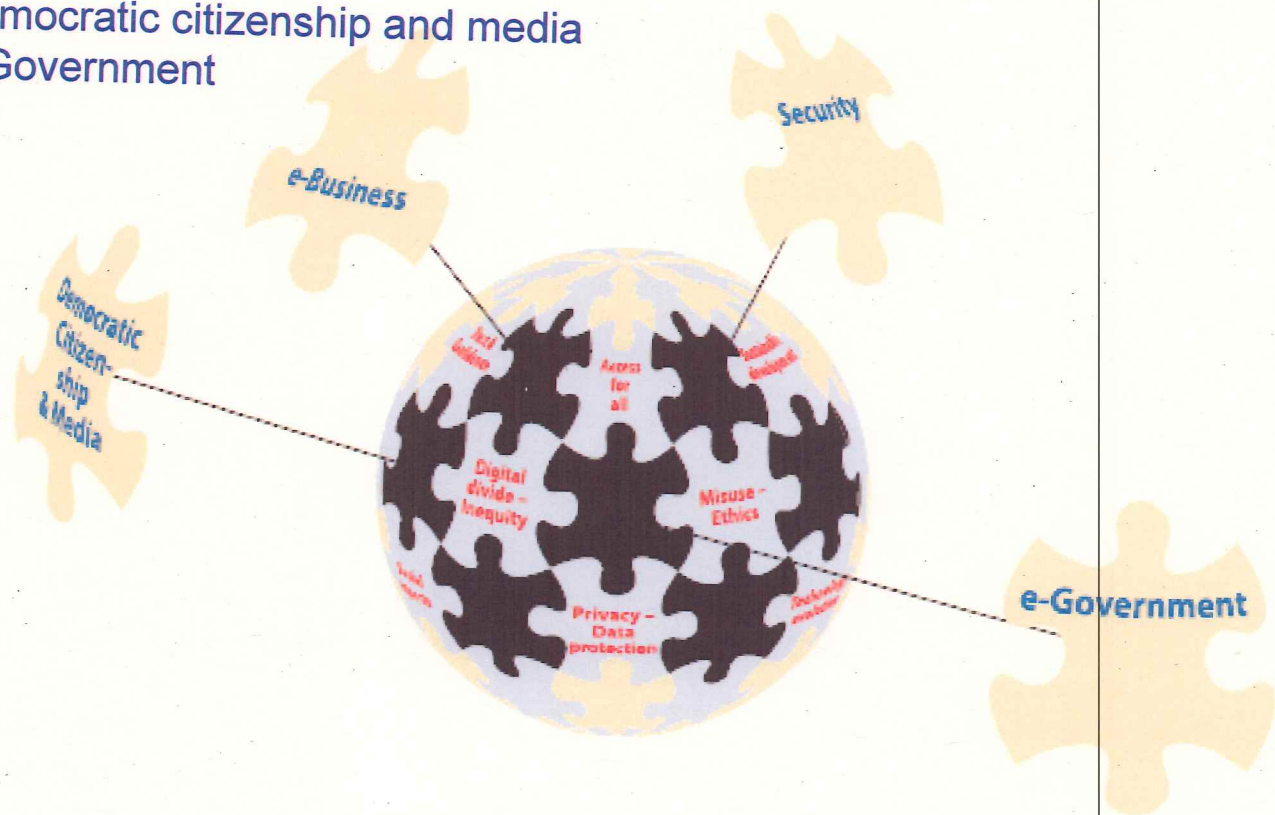
- A. e-Business
- B. Security
- C. Democratic citizenship and media



Source: Raymond Morel. Ministry of Education, Geneva

The E-change puzzle

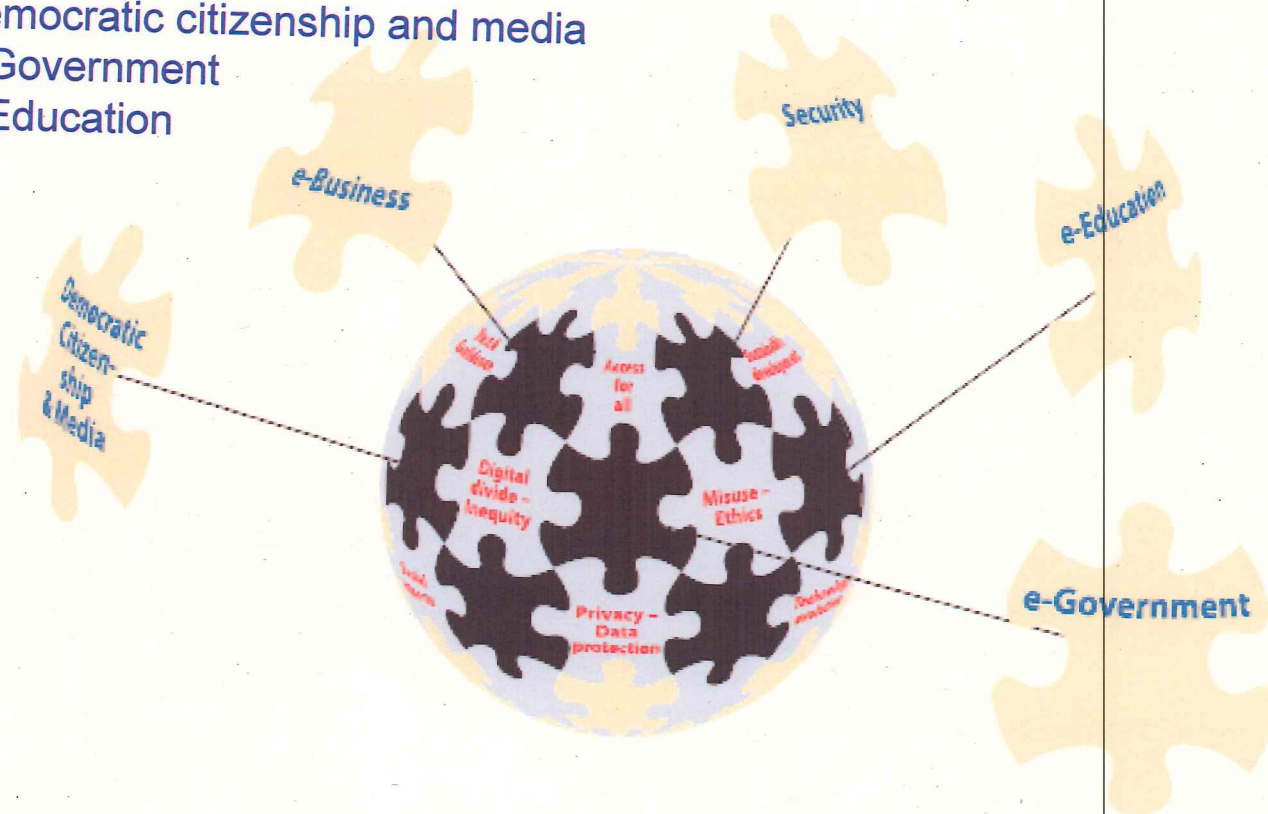
- A. e-Business
- B. Security
- C. Democratic citizenship and media
- D. e-Government



Source: Raymond Morel. Ministry of Education, Geneva

The E-change puzzle

- A. e-Business
- B. Security
- C. Democratic citizenship and media
- D. e-Government
- E. e-Education

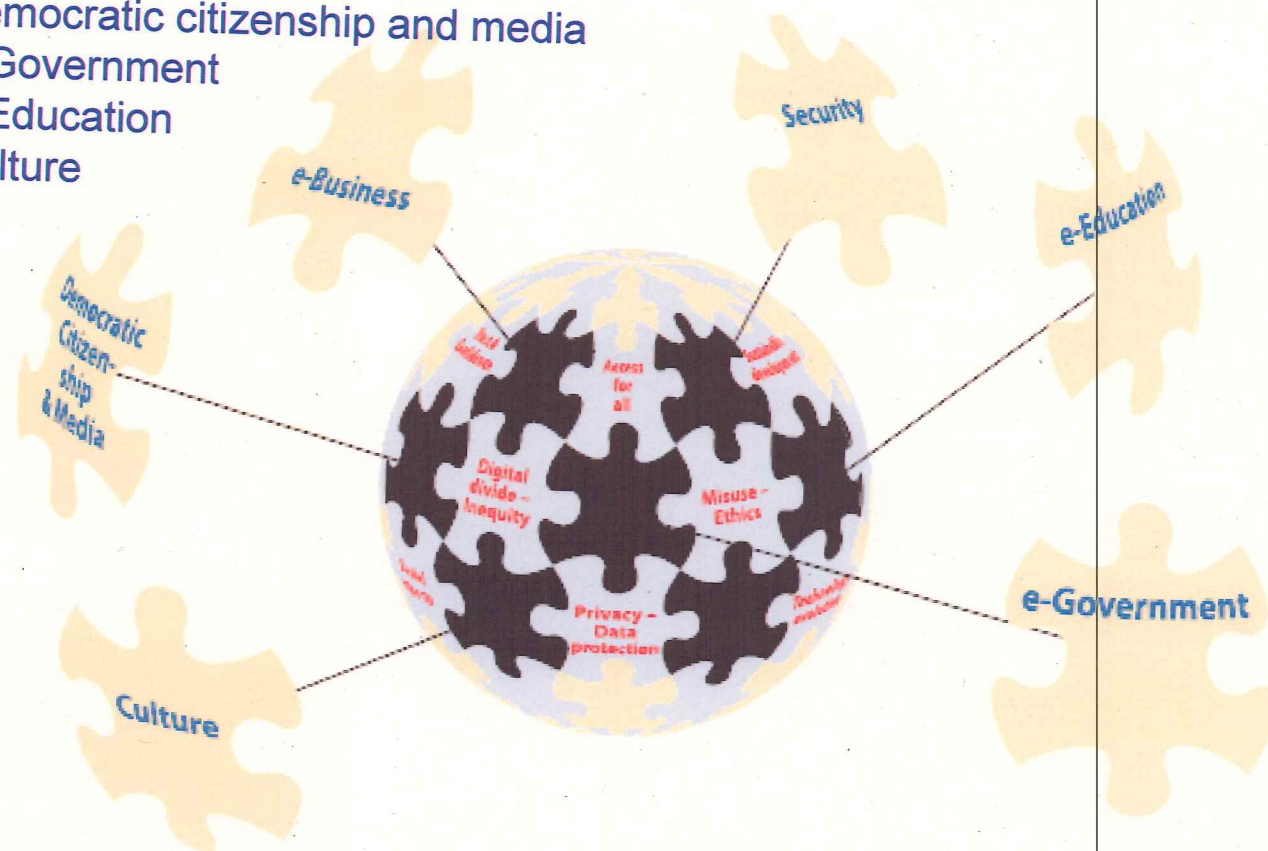


Source: Raymond Morel. Ministry of Education, Geneva



The E-change puzzle

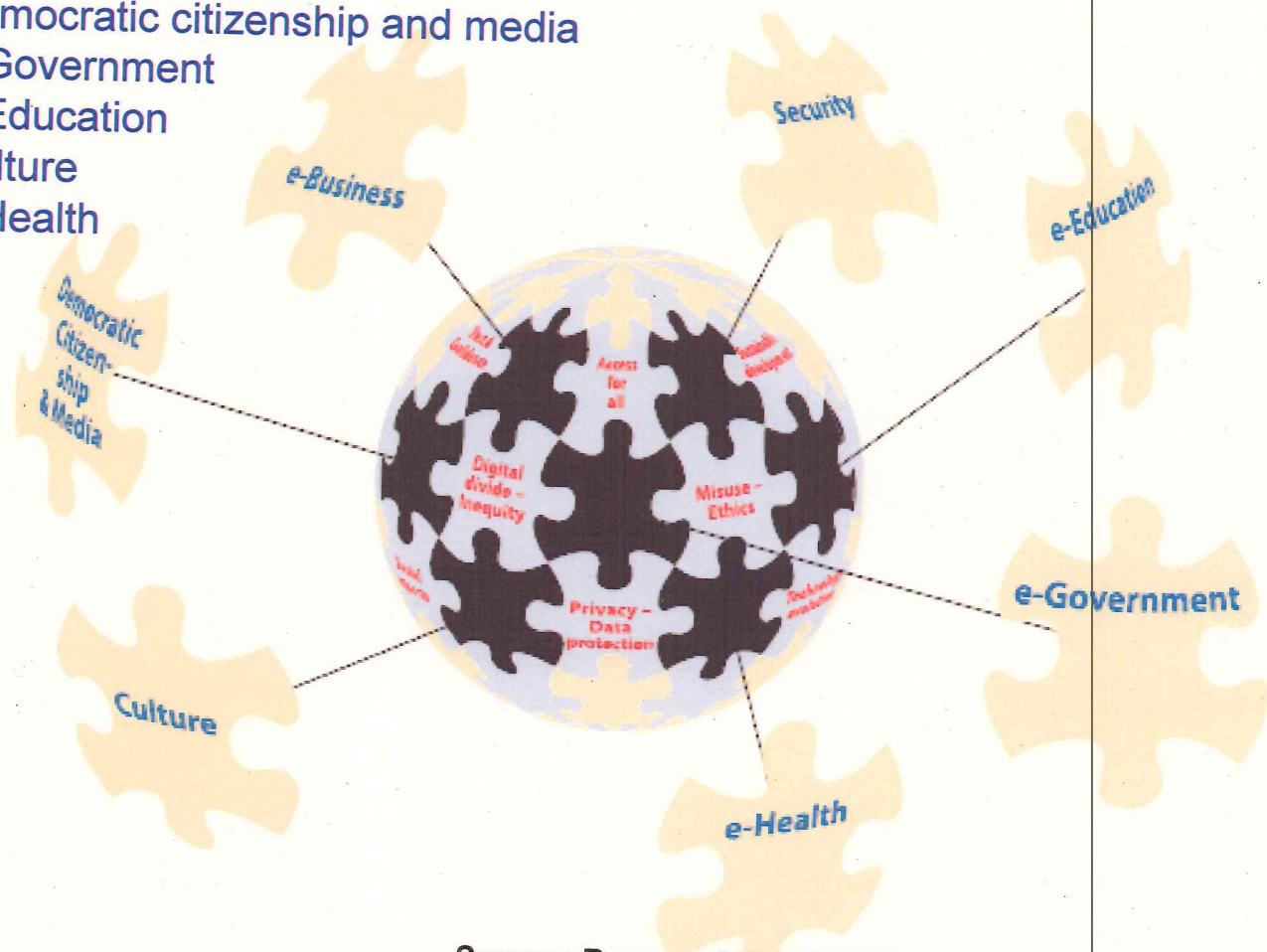
- A. e-Business
- B. Security
- C. Democratic citizenship and media
- D. e-Government
- E. e-Education
- F. Culture



Source: Raymond Morel. Ministry of Education, Geneva

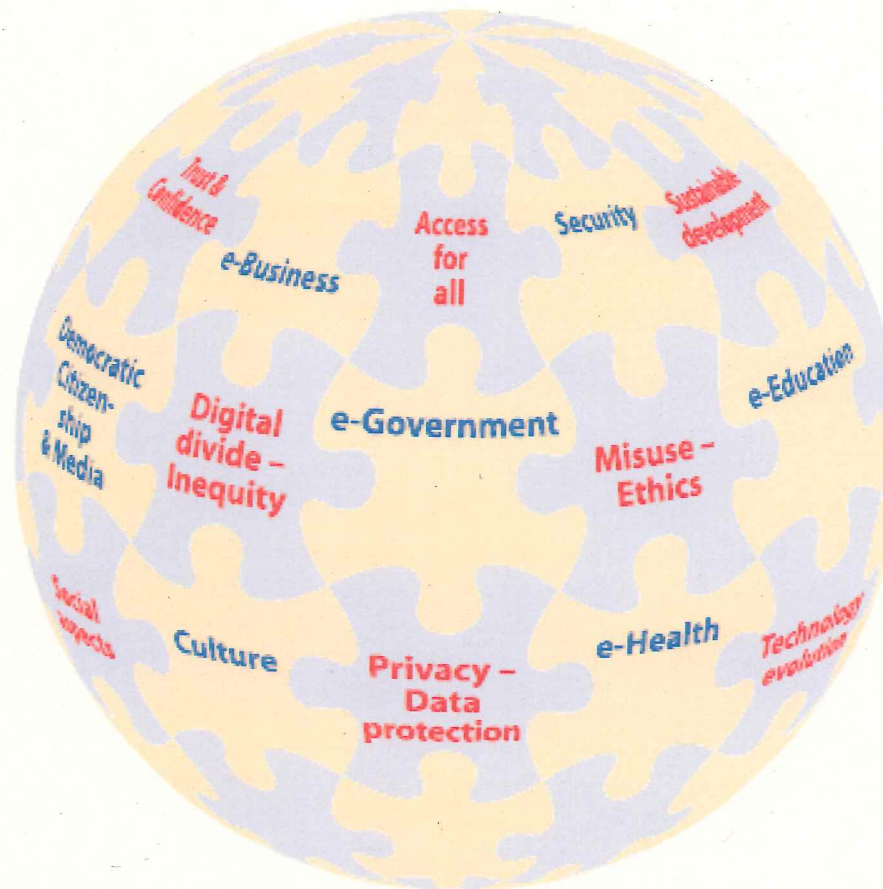
The E-change puzzle

- A. e-Business
- B. Security
- C. Democratic citizenship and media
- D. e-Government
- E. e-Education
- F. Culture
- G. e-Health



Source: Raymond Morel. Ministry of Education, Geneva

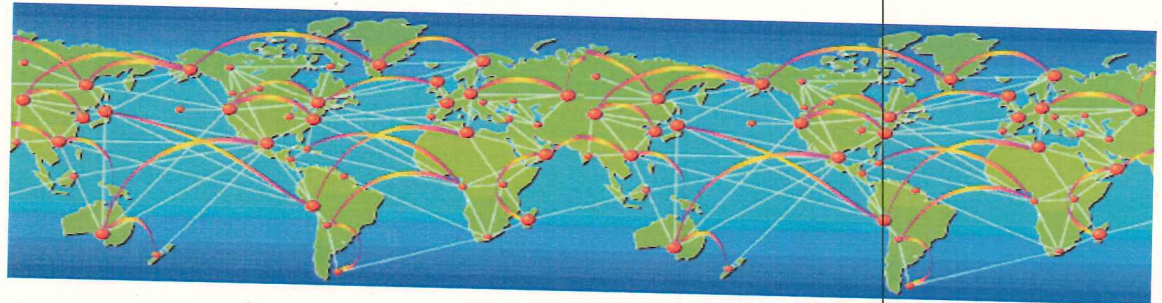
The E-change puzzle



Source: Raymond Morel. Ministry of Education, Geneva



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Dealing with the E-change Puzzle



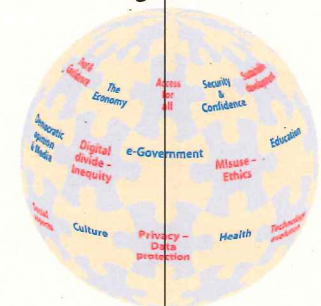
Dealing with the E-change puzzle

Technological change and innovation drive the knowledge-based economy

Some changes in innovation processes could not have occurred without ICTs

Some impacts of ICT might not have been felt in the absence of changes in the innovation system

OECD 2000






Dealing with the E-change puzzle

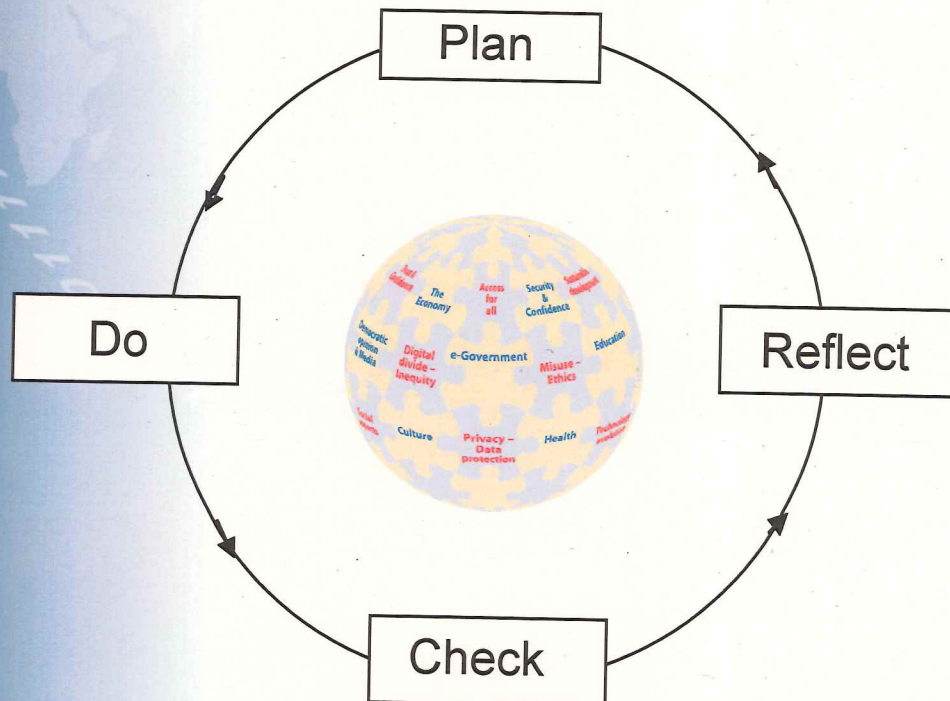
How to hit a moving target?





Dealing with the E-change puzzle

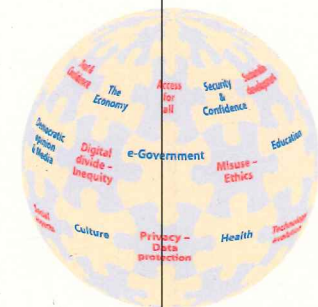
Move with it!





Dealing with the E-change puzzle

Knowledge Society





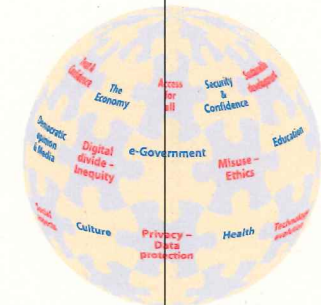
Knowledge society

A knowledge-based economy relies primarily on the use of *ideas* rather than physical abilities:

- Use of *knowledge*
- Creation of *knowledge*
- Sharing of *knowledge*

And on the *application of technology* rather than the transformation of raw materials or the exploitation of cheap labour

World Bank 2002





Dealing with the E-change puzzle

Use of knowledge

Solutions

Creation of knowledge

To make better

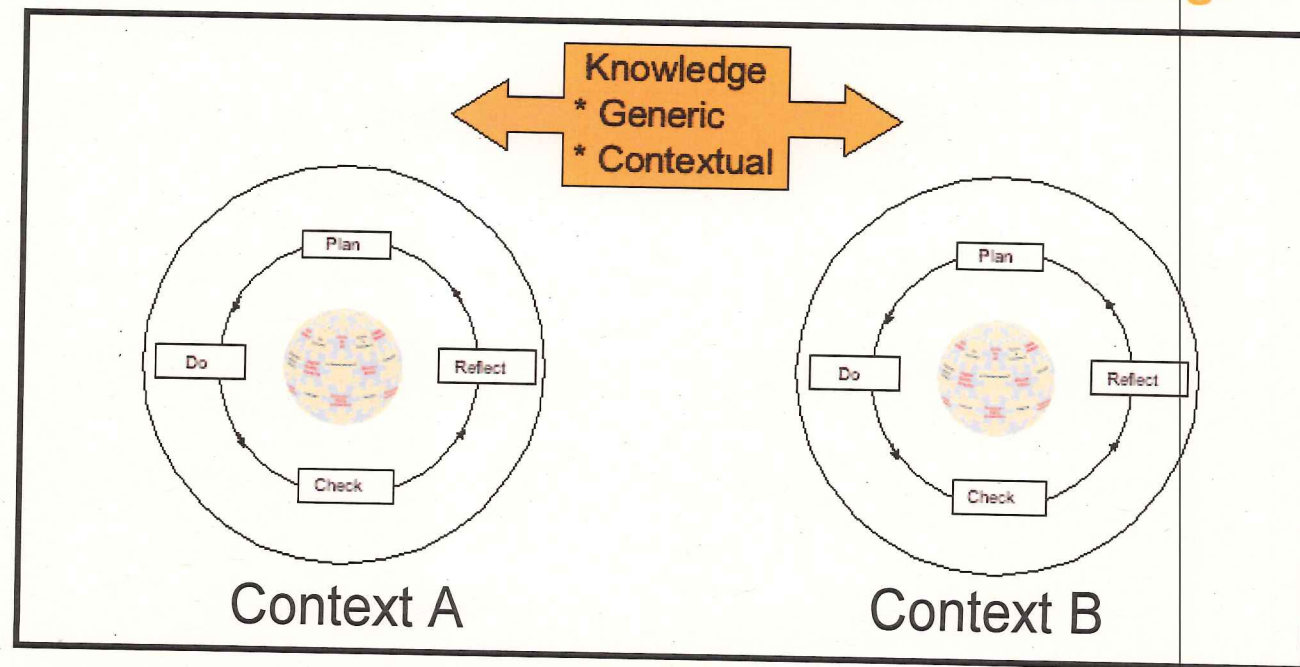
To innovate

Sharing of knowledge

ICT integrated, learning organisation

Dealing with the E-change puzzle

Sharing of generic and contextual knowledge



ICT integrated, learning organisation



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The
Learning Organisation

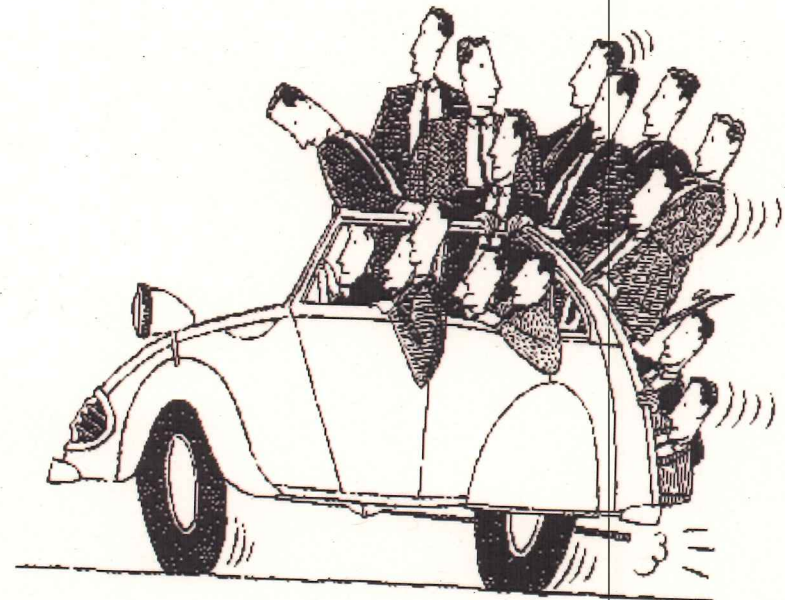
New organisation:

Learning organisation

*Knowledge
application*

Learning

Knowledge creation



Knowledge sharing



Learning organisation: Key competencies

Information: learning from information

Intellect: learning from thinking

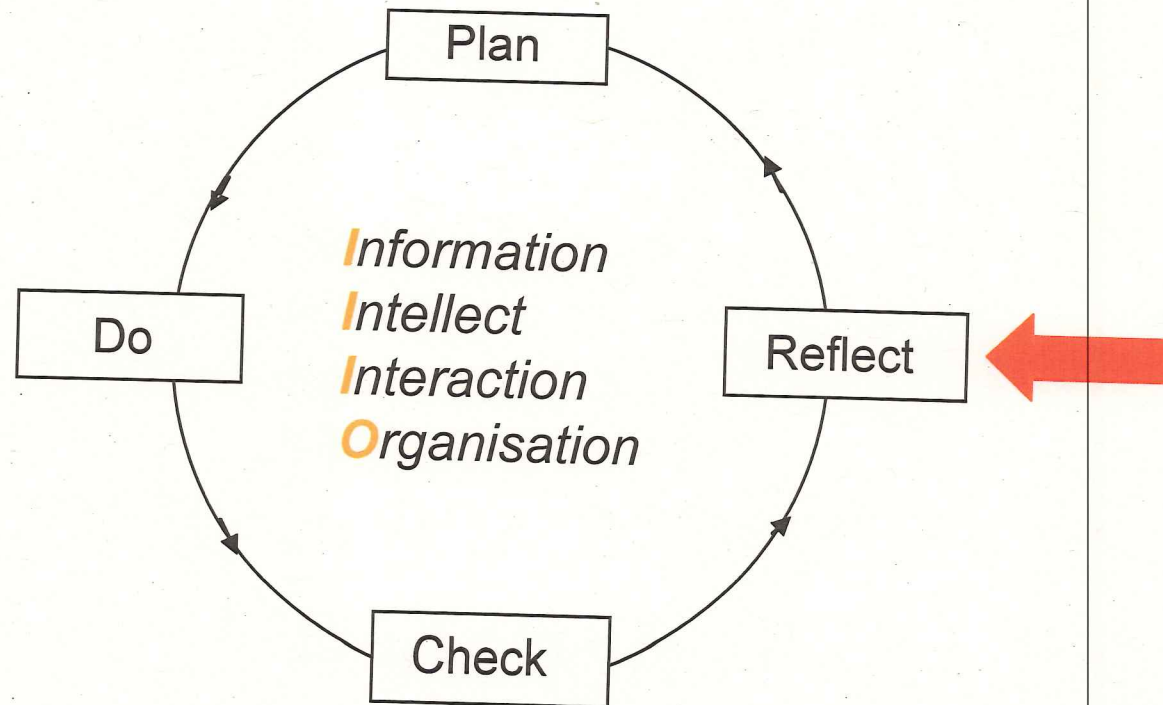
Interaction: learning from social interaction

Organisation: learning from organising

Applying technology



Learning organisation: Reflection at the hart



Reflectiveness: the hart of key competences



Learning organisation: Key competencies

Information:

Intellect:

Interaction:

Organisation:

Knowledge worker

Researcher

Designer

Adviser

Organiser

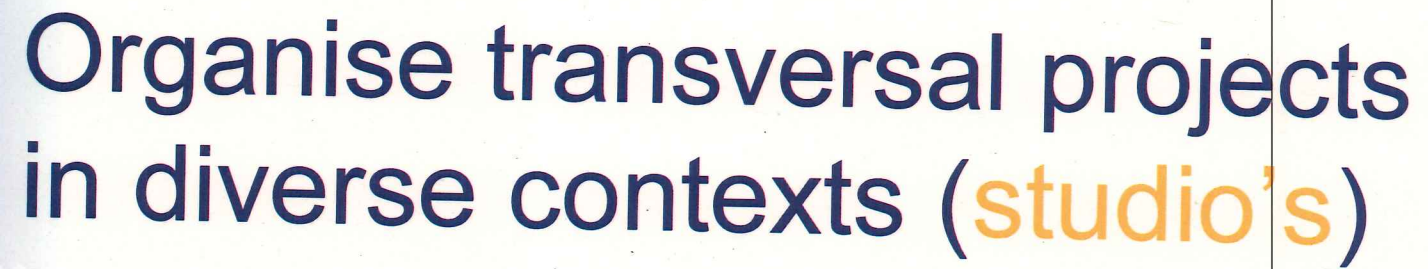
Application of technology



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How to be
Learning Organisation
SEOUL 2.0



A circular diagram illustrating the polymerization process. The cycle consists of four stages: Initiation, Propagation, Termination, and Chain Transfer. Arrows indicate a clockwise flow from one stage to the next, forming a continuous loop.

Context B

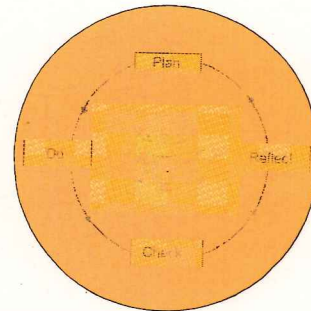


Organise transversal projects in diverse contexts (studio's)

SEOUL 2.0 Studio

Local community for

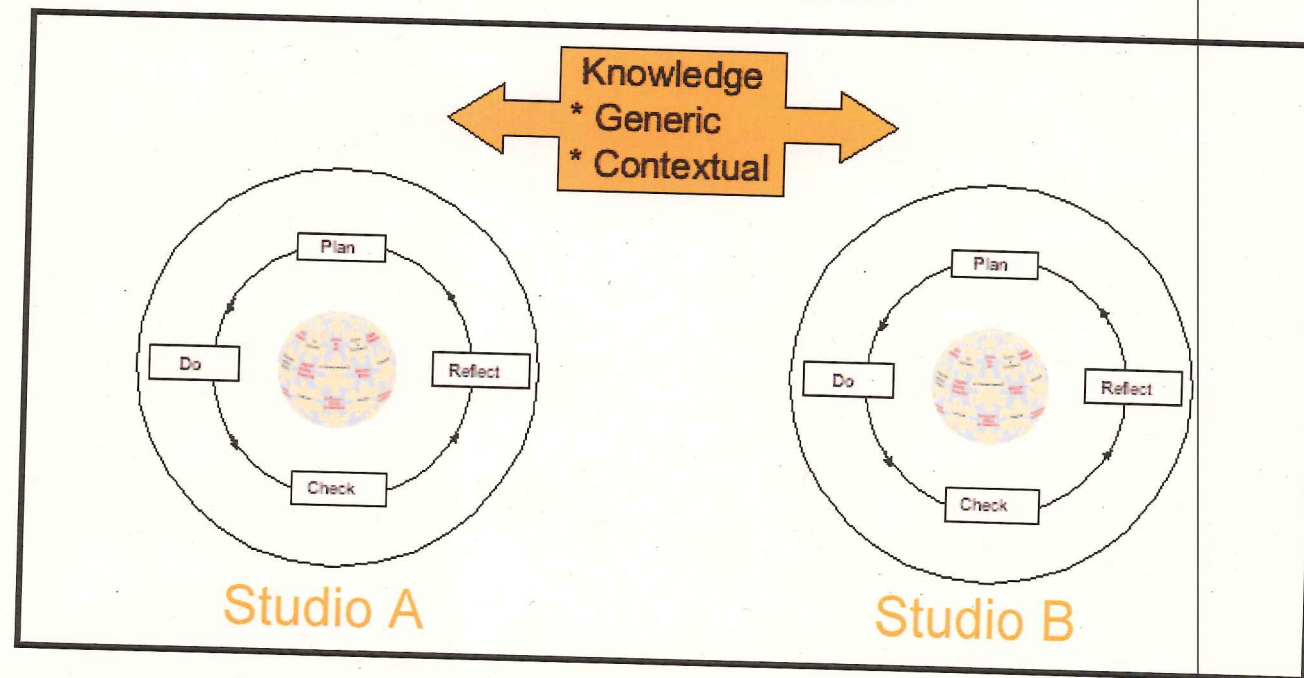
- applying of new principles and methods
- contextual knowledge building
- knowledge exchange processes



Context A

Organise sharing of knowledge in an **Atelier**

SEOUL 2.0 Atelier





Organise sharing of knowledge in an **Atelier**

SEOUL 2.0 Atelier

International community for:

Creation of new principles and
methods

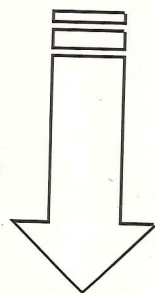
Creation of knowledge
building and exchange processes



Organise feedback between **Ateliers** and **Studio's**

Atelier (generic knowledge)

*Driving
implementation*

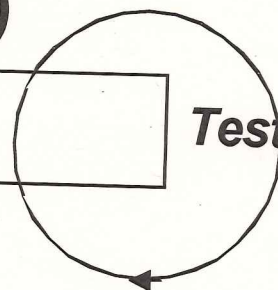


*Learning from
implementation*

Studio (contextual knowledge)

Pilot implementation

Testing

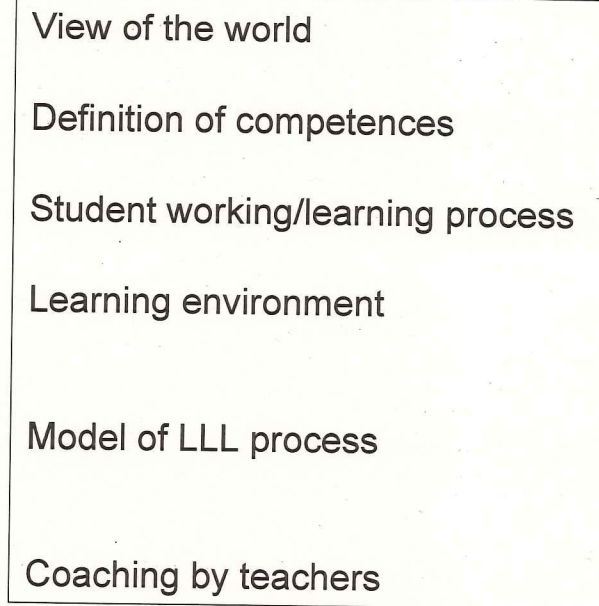




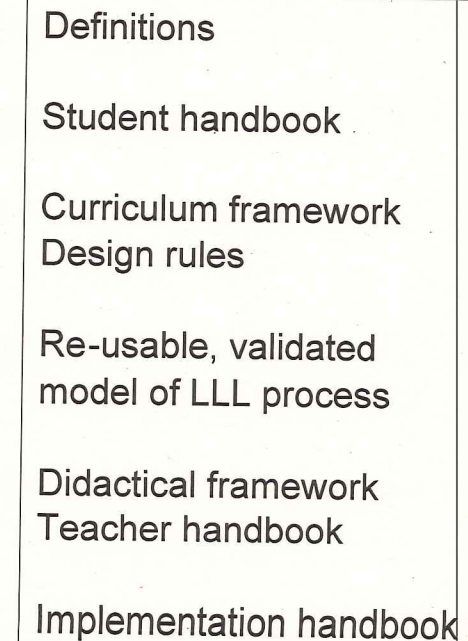
Example project

Digital Solidarity, bridging the digital divide by implementing Lifelong Learning

Atelier



Outcomes



Implementation

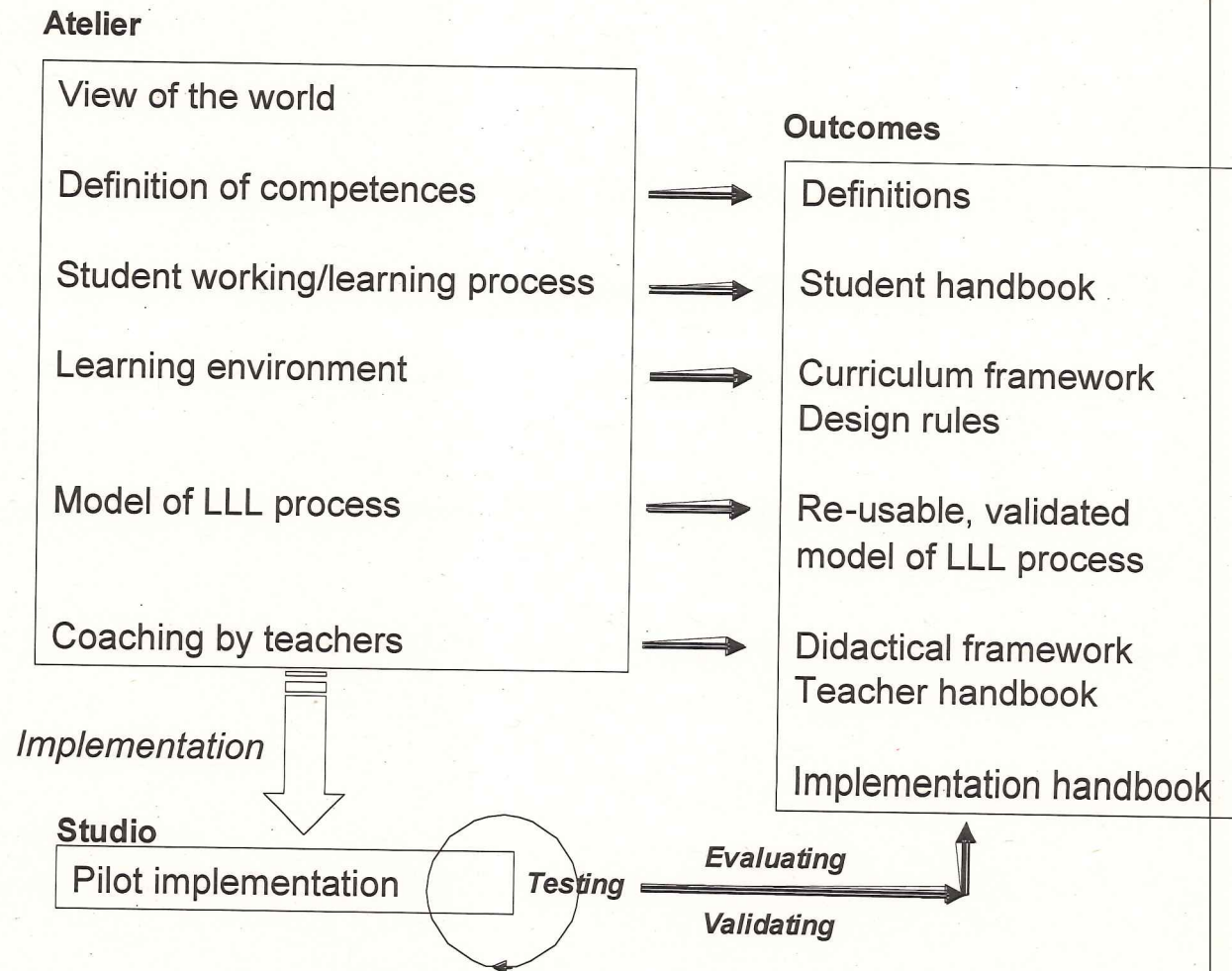
Studio

Pilot implementation

Testing

Evaluating

Validating

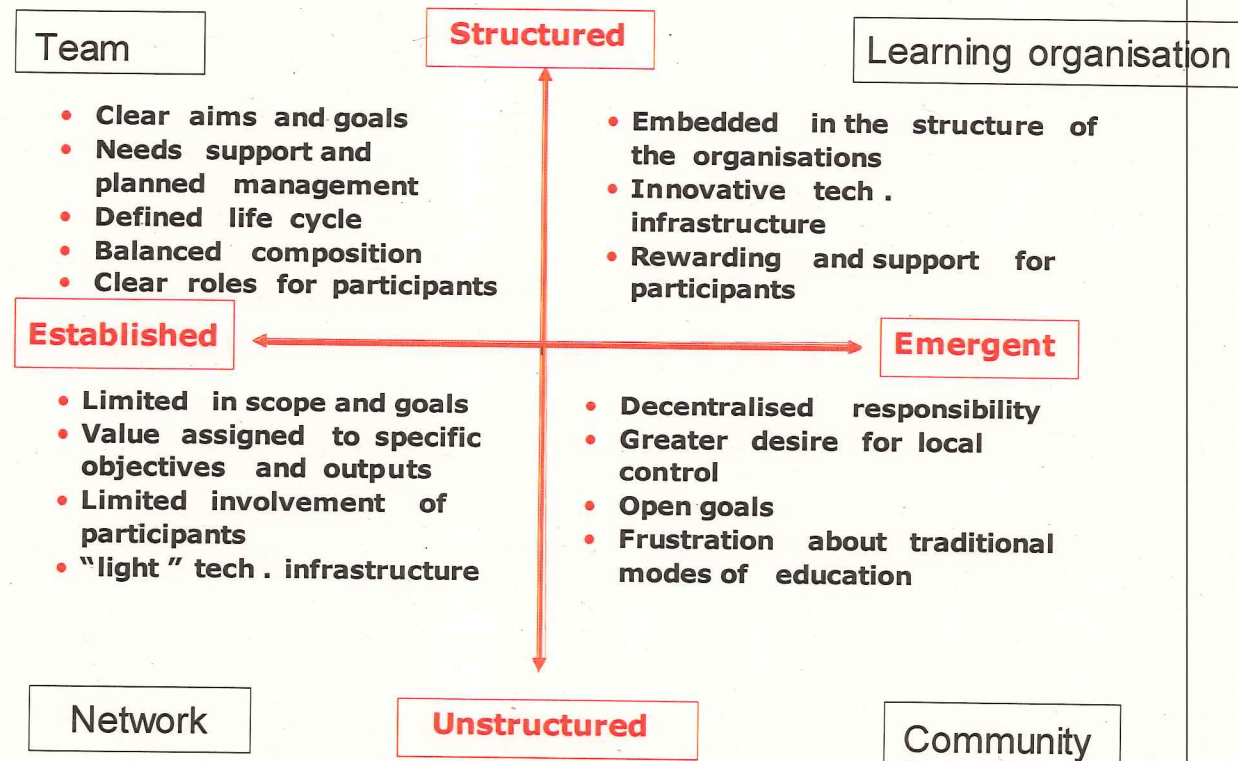




Bring people together

SEOUL 2.0

Network Scenarios





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*How to become a
Learning organisation*
SEOUL 2.0

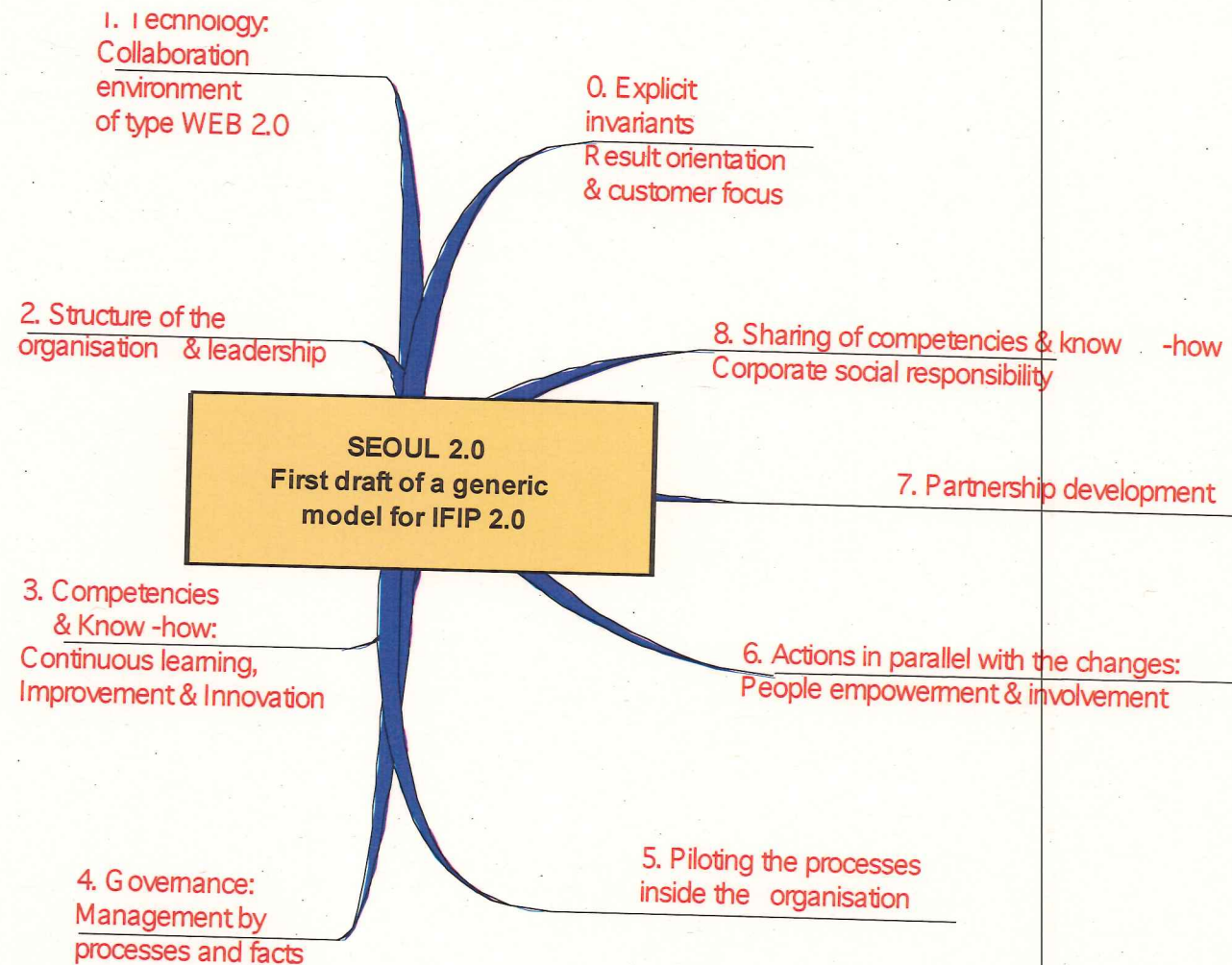


EFQM: Quality of organisation

The Fundamental Quality Concepts:

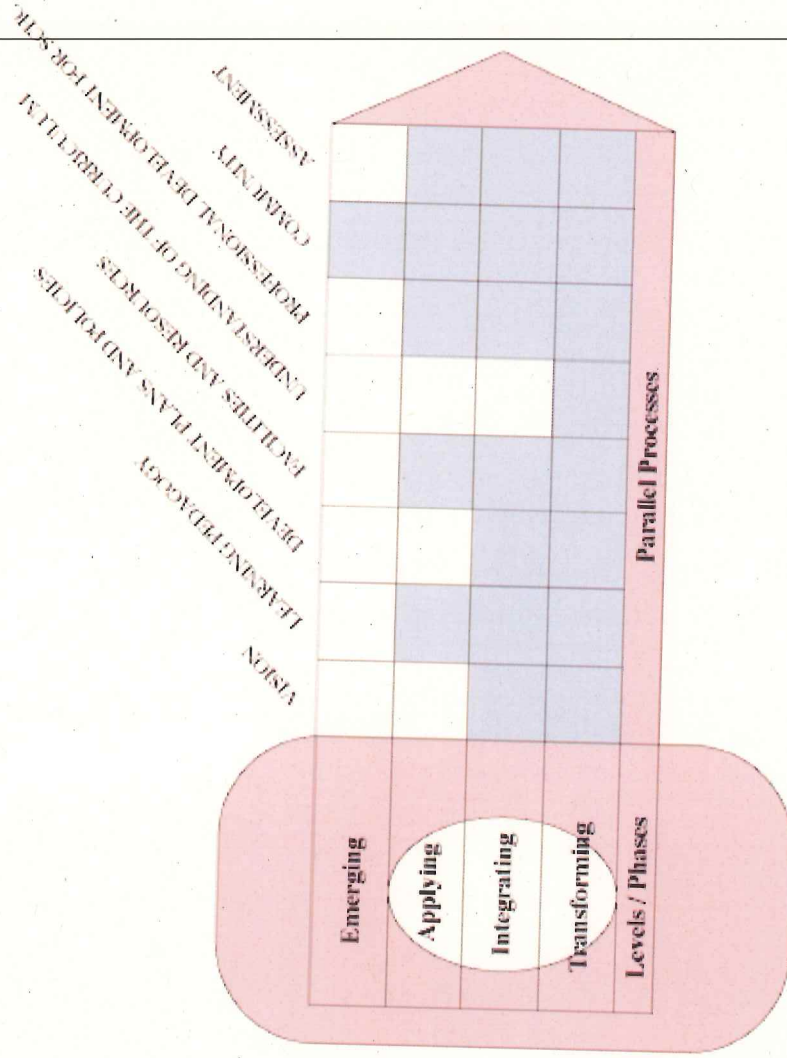
- Results Orientation & Customer Focus (0)
- Leadership and Constancy of Purpose (2)
- Continuous Learning, Innovation and Improvement (3)
- Management by Processes and Facts (4)
- People Development and Involvement (6)
- Partnership Development (7)
- Corporate Social Responsibility (8)

How to become a LO



Organisation development

ICT in education. A curriculum for schools, IFIP/UNESCO

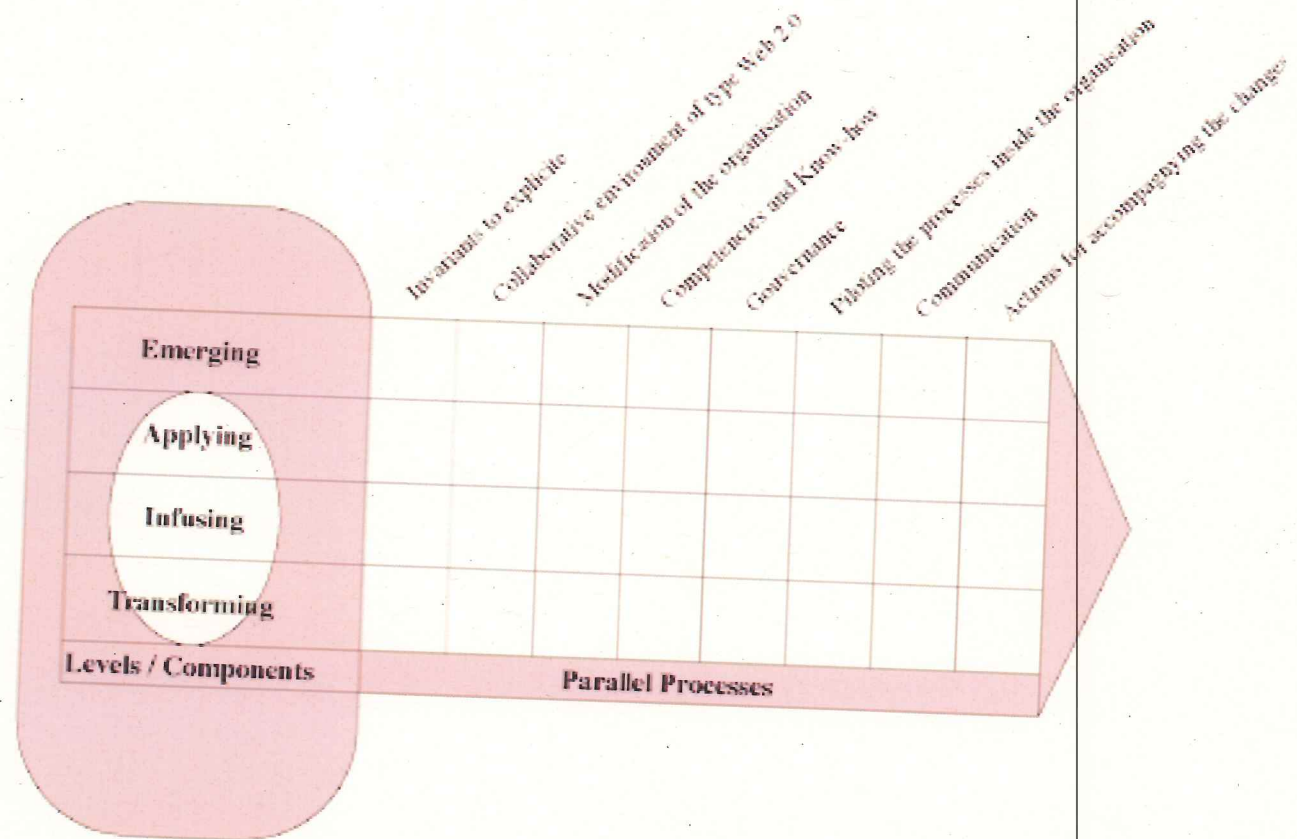




How to become a LO

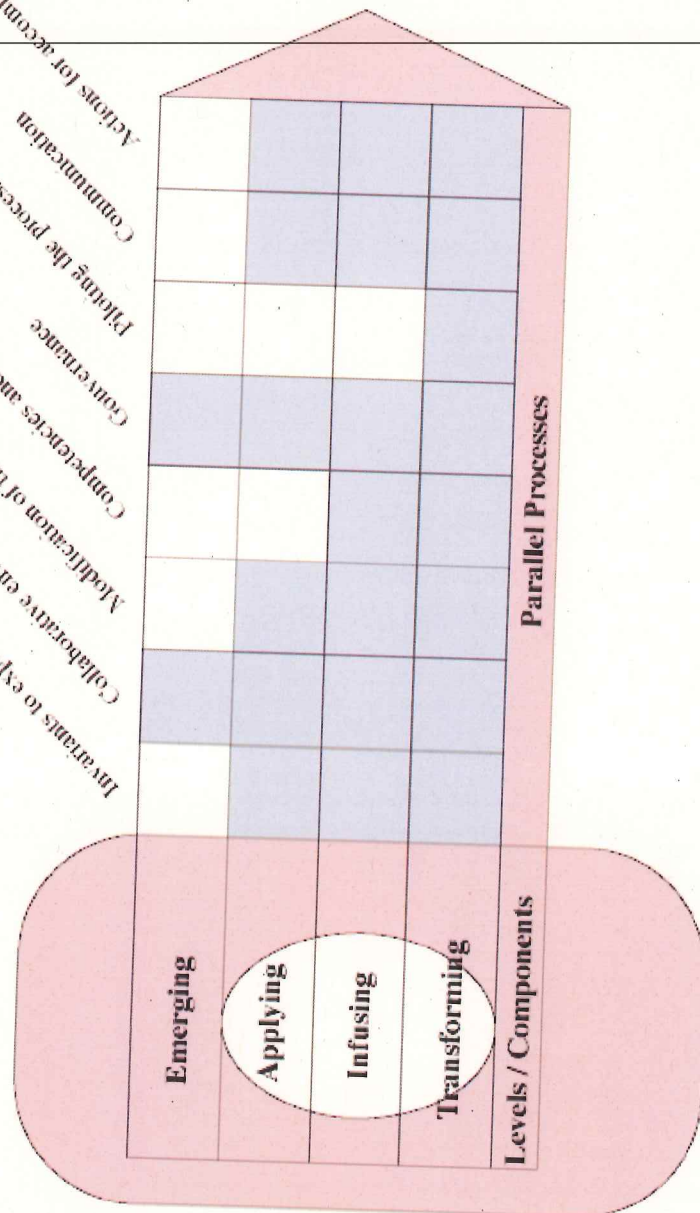
Levels of development	Focus on	
Emerging	Ideas	
Applying	Projects	
Infusing	Integration in normal procedure	
Transforming	Transformation of the organisation	

How to become a LO

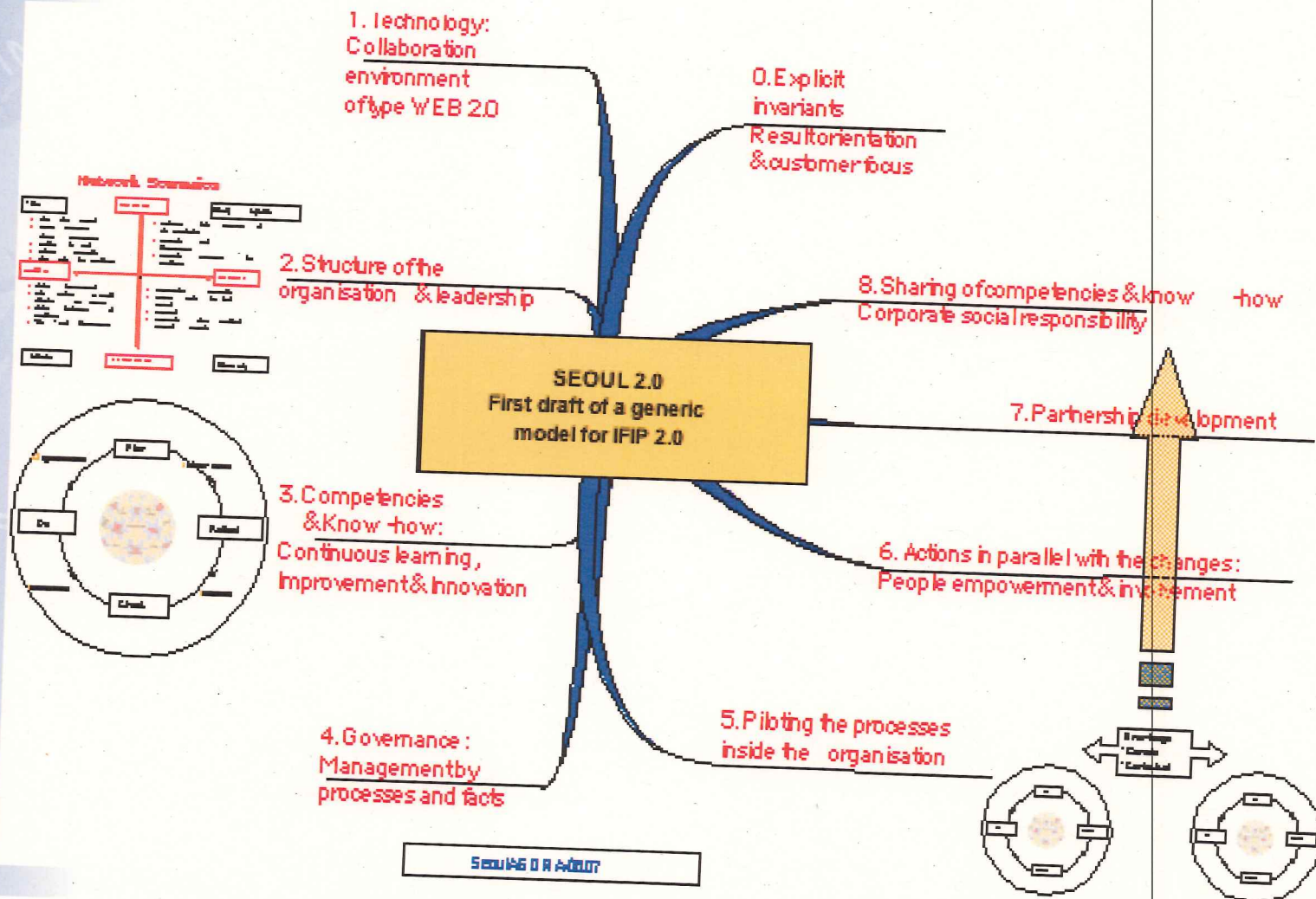


How to become a LO

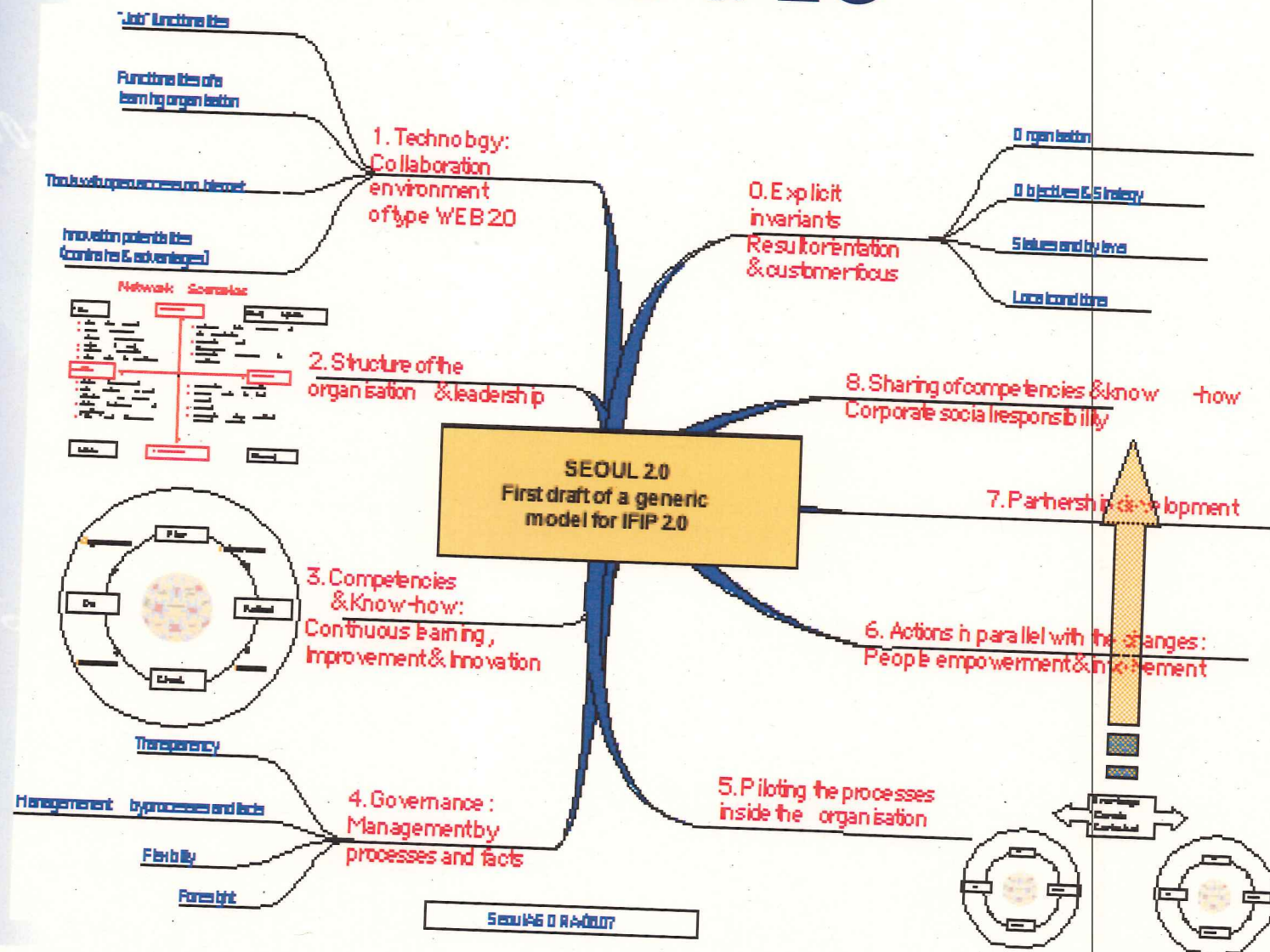
Invariants to explicit
 Collaborative environment of type Web 2.0
 Competencies and know-how
 Piloting the processes inside the organisation
 Communication
 Actions for accompanying the change



How to become a LO



How to become a LO





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information technology

the
**International
Federation for
Information
Processing**

De : Von Solms, Sebastiaan <basievs@uj.ac.za>
À : "Ifip_tcchairs@ifip.org" <ifip_tcchairs@ifip.org>
Cc : "ifip_board@ifip.org" <ifip_board@ifip.org>
Date : Vendredi, 2 janvier 2009 14:12
Objet : [Ifip_board] EU Conference

Bruc

Dear TC Chairs

The EU is organizing a conference on 22/23 January 2009 in Brussels. The theme is 'ICT for a global Sustainable Future' (see <http://www.paradiso-fp7.eu/>)

I have been asked to present one of the keynote presentations on behalf of IFIP. I think it is a good opportunity and platform to advance the services and inputs IFIP can provide on this topic, and to try to expand the footprint of IFIP amongst relevant players. The reference document of the conference can be found at http://www.paradiso-fp7.eu/documents/PARADISO_RefDoc_Draft.pdf

I would appreciate your input and advice on a few matters :

1. From your TC's field of specialization, what research areas do you think should need attention to advance 'ICT for a global Sustainable Future'?
2. Do you think your TC can play a role in this wider project? If so, in what way?
3. In general, do you think IFIP can play a role in this wider project? If so, in what way?
4. Do you think IFIP should aggressively offer its services and expertise on a wider level in line with the theme of the conference?

Unfortunately, they need my presentation by January 12, so I would appreciate a speedy reply from you. I apologize for the short time scale, but this invitation only arrived in December last year.

I would really appreciate some inputs and comments from your side, as I really want to make the world more aware of the expertise and knowledge within IFIP.

A prosperous 2009 to all of you

Regards

Basie

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University of Johannesburg
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Mobile : +27825532436
Home Page : adam.rau.ac.za/~basie

This email and all contents are subject to the following disclaimer:

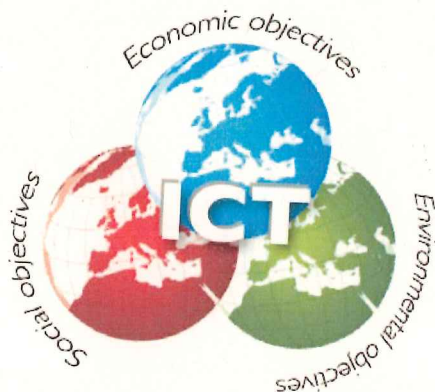
http://www.uj.ac.za/UJ_email_legal_disclaimer.htm

Ifip_board mailing list
Ifip_board@ifip.org
http://www.ifip.org/mailman/listinfo/ifip_board

ICT for a global sustainable future

How ICT can durably contribute to the wellbeing of all citizens around the world

International Conference
European Commission - Brussels
January 22-23, 2009



Organized under the aegis of
the European Commission



With the support of

Today's societies are facing increasingly complex issues, unprecedented in the history of mankind, and serious risks of breakdowns are in sight, as far as environmental, economic and social issues are concerned.

In order to avoid major worldwide crises, industrial, emerging and developing countries will need to agree, sooner or later, on an alternative way forward, based on a true sustainable development, a more sustainable economic growth, more equally shared resources.

What is at stake is durable innovation paths for companies and, ultimately, the wellbeing of all citizens of the world to be measured by new indexes going "beyond GDP".

Information and Communication Technologies (ICT) will play a central role in this future, not only because ICT have become in just two decades a key driver of the development of all countries worldwide, but also because ICT can efficiently contribute to the achievement of the revised economic, social and environmental objectives which this future envisages.

Moreover, Europe is undoubtedly well placed to proactively promote this new concept of progress towards a true sustainable future.

It is in this context that the "ICT for a global sustainable future" conference is organised, and aims at giving the opportunity to participants to thoroughly understand and discuss what is at stake and which research areas can be usefully explored in the short and in the longer terms so that appropriate infrastructures, applications and services, based on Information and Communication Technologies, can be available tomorrow for the citizens of the world.



and of the PARADISO FP7 project



KEYNOTE SPEAKERS

(as of Nov. 6, 2008)



Viviane Reding
Commissioner for
Information Society and
Media,
European Commission



Kofi Annan
Former Secretary-
General, United Nations
(TBC)



**Hamadoun I.
Touré**
Secretary-General
ITU



Jeremy Rifkin
President, Foundation on
Economic Trends
(TBC)



**Abdul Waheed
Khan**
Assistant DG for
Communication and
Information, UNESCO



Vittorio Prodi
Member of the European
Parliament



**Enrico
Giovannini**
Director of the Statistic
Directorate and Chief
statistician, OECD



Anders Wijkman
Member of the European
Parliament



**Maria de Graça
Carvalho**
Principal Adviser to the
Bureau of European
Policy Advisers,
European Commission



**Immanuel
Wallerstein**
Professor, Yale University



Guo Liang
Deputy Director,
Center for social
development, Chinese
Academy of Social
Sciences (TBC)



Bianca Jagger
Executive Committee
Chair
World Future Council



Frantz Verella
Minister for Public
works, Transport and
Communications, Haiti



James Leape
Director General, World
Wildlife Fund International



Lynn St Amour
President and CEO
The Internet Society



Peter Madden
Chief executive
Forum for the Future



**Mohammed A.
AlAmer**
President, Central
Informatics
Organization, Bahrain



Ashok Khosla
President, International
Union for Conservation of
Nature



**Michelangelo
Pistoletto**
Painter and art theorist



Martin Lees
Secretary General,
Club of Rome

Other confirmed contributions (video messages):

Rajendra Pachauri
Nobel Peace Prize, Chair of the Intergovernmental Panel
on Climate Change

Amartya Sen
Economist and philosopher, Nobel Memorial Prize in
Economic Science

Vinton Cerf
VP and Chief Internet evangelist, Google

Jared Diamond
Professor, UCLA

VENUE

The "ICT for a global sustainable future conference" will take place in the Charlemagne building of the European Commission (room capacity: 450 persons) located 170 rue de la Loi, close to the Berlaymont building of the European Commission (picture) in the central part of Brussels (metro station: Schuman).



REGISTRATION

Registration for this event is free of charge but pre-registration is compulsory due to security rules linked to access into the Charlemagne building. It is highly recommended to register as soon as possible since, due to room capacity constraints, the registration process may be closed prior to the event. Only online registrations (through the event web site: <http://www.paradiso-fp7.eu>) are accepted and subject to confirmation. Thank you in advance for your kind understanding.

FURTHER INFORMATION

Please visit <http://www.paradiso-fp7.eu> for more detailed information.

CONTACT

At the European Commission:

- Jacques Babot (jacques.babot@ec.europa.eu)
- Fabrizio Sestini (fabrizio.sestini@ec.europa.eu)

For the PARADISO project:

- Roger Torrenti (roger.torrenti@paradiso-fp7.eu)
- Roland Burger (roland.burger@paradiso-fp7.eu)

CONFERENCE STRUCTURE AND PROGRAMME

The event will start on Thursday, Jan. 22 at 10:00am and end on Friday, Jan. 23 at 4:30pm. The first day will be mainly devoted to keynote addresses presented by supporting organisations and contributions from worldwide experts in ICT and societal developments. The second day will focus on "the way forward", will include presentations and discussions related to the "PARADISO reference document" disseminated prior to the event, and will eventually discuss the roadmap to efficiently build on event outputs. The detailed event programme is updated on a regular basis on the event web site (<http://www.paradiso-fp7.eu>).

**"The right conference
at the right time"**

Thursday, January 22

09:00 *Welcome of participants*

10:00 *Opening addresses*

Viviane Reding, Commissioner for Information Society and Media, European Commission

Vittorio Prodi, Member of the European Parliament

Hamadoun I. Touré, Secretary-General, International Telecommunication Union (ITU)

Kofi Annan, Former Secretary-General of United Nations (tbc)

11:15 *Coffee/Tea Break*

11:45 *Today's global challenges: keynote addresses*

Moderated by **Anders Wijkman**, Member of the European Parliament

Maria da Graça Carvalho, Principal Adviser to the Bureau of European Policy Advisers, European Commission

Abdul Waheed Khan, Deputy DG for Communication and Information, UNESCO

Kemal Dervis, Head of the United Nations Development Programme (UNDP) (tbc)

Nicholas Stern, Former Chief economist, World Bank (tbc)

Guo Liang, Deputy Director, Center for social development, Chinese Academy of Social Sciences

Immanuel Wallerstein, Professor, Yale University

13:15 *Lunch break*

14:45 *Visions of a true sustainable future: keynote addresses*

Moderated by **Roger Torrenti**, coordinator of the PARADISO FP7 Project

Bianca Jagger, Executive Committee Chair, World Future Council

Ashok Khosla, President, International Union for Conservation of Nature

Peter Madden, Chief executive, Forum for the Future

Martin Lees, Secretary General, Club of Rome

Michelangelo Pistoletto, Painter and art theorist

Enrico Giovannini, Director of the Statistic Directorate and Chief statistician, OECD

16:15 *Coffee / Tea Break*

16:45 *The role of ICT to ensure a global sustainable future*

Moderated by **Mario Campolargo**, Director, DG Information Society and Media, European Commission

Frantz Verella, Minister for Public works, Transport and Communications, Haiti

Chris Hughes, Cofounder, Facebook (tbc)

Mohammed A. AlAmer, President, Central Informatics Organization, Bahrain

Lynn St Amour, President and CEO, The Internet Society

James Leape, Director General, World Wildlife Fund International

Jonathan Zittrain, Professor, Co-director of Harvard's Berkman Center for Internet & Society (tbc)

18:15 *Break*

18:30 *Keynote lecture from **Jeremy Rifkin**, President, Foundation on Economic Trends (TBC)*

CONFERENCE

ICT FOR A GLOBAL SUSTAINABLE FUTURE*How can ICT durably contribute to the wellbeing of all citizens around the world?*

International Conference
January 22-23, 2009
European Commission - Brussels

Today's societies are facing increasingly complex issues, unprecedented in the history of mankind, and serious risks of breakdowns are in sight, as far as environmental, economic and social issues are concerned. In order to avoid major worldwide crises, industrial, emerging and developing countries will need to agree, sooner or later, on an alternative way forward, based on a true sustainable development, a more sustainable economic growth, more equally shared resources. What is at stake is durable innovation paths for companies and, ultimately, the wellbeing of all citizens of the world to be measured by new indexes going "beyond GDP".

Information and Communication Technologies (ICT) will play a central role in this future, not only because ICT have become in just two decades a key driver of the development of all countries worldwide, but also because ICT can efficiently contribute to the achievement of the revised economic, social and environmental objectives which this future envisages. Moreover, Europe is undoubtedly well placed to proactively promote this new concept of progress towards a true sustainable future.

In this context, the "ICT for a global sustainable future" conference is organised, with the support of the PARADISO project, on January 22-23, 2009 at the European Commission in Brussels (**Charlemagne building, 170 rue de la Loi**).

The event officially takes place under the aegis of the European Commission and takes advantage of the support of many leading organizations: the **OECD**, **UNESCO**, **ITU**, **WWF**, the **Club of Rome**, the **World Future Council**, and the **Forum for the Future**.

The event will give the opportunity to participants to thoroughly understand and discuss what is at stake and which research areas can be usefully explored in the short and in the longer terms so that appropriate infrastructures, applications and services, based on Information and Communication Technologies, can be available tomorrow for the citizens of the world.

The event will start on Thursday, Jan. 22 at 10:00am and will be officially opened by European Commissioner Viviane Reding. It will end on Friday, Jan. 23 at 4:30pm. The first day will be mainly devoted to keynote addresses, visions presented by supporting organisations and contributions from worldwide experts in ICT and societal developments, addressing the various issues summarised above. The second day will focus on "the way forward", will include presentations and discussions related to the "PARADISO reference document" disseminated prior to the event, and will eventually discuss the roadmap to efficiently build on event outputs.



Over 400 individuals and organisations, active or interested in the areas of ICT and of societal developments are expected to attend. Even if registration for the event is free of charge, pre-registration is compulsory, due to security rules linked to access to event venue. Moreover, early registration is strongly recommended since, due to room capacity constraints, the registration process may be closed prior to the event.

Please note that there is no Call for papers published for this conference but that some contributions submitted in response to the open consultation launched following the release of the draft version of the PARADISO reference document will be selected and presented during the conference. We therefore invite you to submit a contribution to

the **Open consultation**.

For any further information you may need, please **contact us**.

NEWSROOM

This section provides detailed information on the activities developed in the framework of the PARADISO project, namely on the PARADISO [Reference document](#) and on the [International Conference](#) of Jan. 22-23, 2008. It also includes other information items related to issues addressed by the PARADISO project. Should you like to suggest publishing an information on this web site, please [email us](#) a short text, if possible with an illustration (as a jpg file) and any attachments (as pdf files) to which the text would refer.

Should you like to automatically receive the most important announcements related to our activities, please fill in the [online form](#).

October 20, 2008

A growing number of keynote speakers at the January Conference

Is it seen as 'the right conference at the right time'? It seems so since day after day, keynote speakers from Europe and other parts of the world confirm their participation in the 'ICT for a global sustainable future' conference organised on Jan. 22-23, 2009...

[Read more](#)



October 3, 2008

You can now register for the Conference of January 22-23, 2009

The registration process for the international conference of next January 22-23, organised by the PARADISO project under the aegis of the European Commission on the theme 'ICT for a global sustainable future' is now open...

[Read more](#)



October 1, 2008

2008 Seminar of the Council of Europe

The [Council of Europe](#), in partnership with the Autonomous Province of Trento (Italy) and the [OECD](#) is organising a seminar on November 27-28, 2008 in Strasbourg...

[Read more](#)



September 30, 2008

PARADISO will contribute to the WWRF 21st meeting

PARADISO has been invited to contribute to the 21st meeting of the Wireless World Research Forum ([WWRF](#)), held from next October 13 to 15 in Stockholm ...

[Read more](#)



September 24, 2008

The European Commission advocates new strategy for international cooperation in S&T

Today, the European Commission called on governments to jointly develop a strategy for international cooperation in science and technology. It proposed a strategic framework for jointly strengthening science and technology cooperation...

[Read more](#)



September 24, 2008

A networking session on PARADISO issues to be held at ICT 2008

An open networking session focusing on PARADISO issues will take place in the framework of the ICT 2008 event to be held in Lyon from Nov. 25 to 27, 2008 under the aegis of the European Commission ([DG Information Society and Media](#))...

[Read more](#)



REFERENCE DOCUMENT

A PARADISO reference document has been produced in its draft version in September 2008 and can be downloaded [here](#) as a pdf file. It will be available in its draft final version in December 2008, and in its final version in February 2009.

This document further develops the PARADISO vision (see the [In a few words](#) section) and:

- explores a new concept of progress that developed, emerging, and developing countries might share, aiming at a true sustainable development, a more sustainable economic growth, more equally shared resources, and eventually the well-being of peoples around the world, measured through a new index related to the progress of societies,

- investigates the role that ICT can play in the hypothesis of such global societal developments, and derives the strategic research areas that can usefully be explored in the short term in order that suited solutions can be made available in the future.

The PARADISO scientific [workshop](#) organised on June 12-13, 2008 in Brussels and the PARADISO "ICT for a global sustainable future" [conference](#) to be held on January 22-23, 2009 in Brussels are opportunities to openly discuss the successive versions of the PARADISO reference document with individuals and organisations from all around the world.

Moreover, in order to take into account the inputs from the largest number of individuals and organisations having an interest in the addressed topics, an open consultation has been launched. Should you wish to contribute, please fill in the below form. All received contributions will be made public on this web site before the conference of January 22-23, 2009. Some (particularly those addressing the strategic ICT research areas that can usefully be explored) will be selected to be formally presented during a specific session of this event.

PARADISO OPEN CONSULTATION

Full name

Organisation

Country

Email

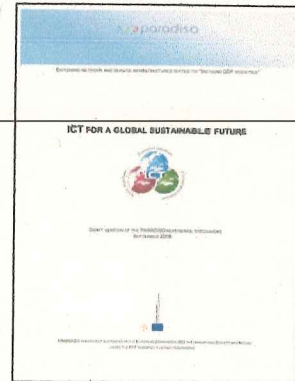
Title of your contribution

Your contribution

(5000 chars left)

Antispam Code

submit



International Conference January 22-23, 2009

European Commission - Brussels

PARADISO draft document
Not to be disseminated by third parties

European Commission
Information and Media

ICT FOR A WORLD SUSTAINABLE FUTURE



Organised under the aegis of the European Commission

with the support of
OECD, UNESCO, ITU, WWF, Club of Rome, World Future Council, Forum for the future
(tentative list as of August 31, 2008)

Conference background and objectives

During the last few decades the world has experienced profound changes: growth of the worldwide population and changes in its structures, globalization of markets, emergence of new economy giants, increase in the use of world resources and of human impact on the environment, overwhelming dimension of Information and Communication Technologies (ICT), etc.

Today's societies are facing increasingly complex issues, unprecedented in the history of mankind, and serious risks of breakdowns are indeed in sight, as far as environment, economic and social issues are concerned. In order to avoid major worldwide crises, developed, emerging and developing countries will need to agree, sooner or later, on an alternative way forward, based on a true sustainable development, a more sustainable economic growth, more equally shared resources.

Europe is undoubtedly well placed today to proactively promote a new concept of progress, towards a true sustainable future. The perspective of this disruptive paradigm shift is not bad news for citizens, whose well-being, measured through a new index, "beyond GDP", should be the ultimate goal of new policies aiming at ensuring the effective stability and soundness of the development paths of our societies. It is not bad news for companies neither: innovation is needed.

Information and Communication Technologies (ICT) will play a central role in this future, not only because ICT have become in just two decades a key driver of the development of all countries worldwide, but also because ICT can efficiently contribute to the achievement of revised economic, social and environmental objectives which this future requires.

The present event is organised at the initiative of the PARADISO project (www.paradiso-fp7.eu), supported by the European Commission, and in the framework of which a think-tank gathering worldwide experts in ICT and societal developments have been exploring how ICT in general, and the Future Internet and network and service infrastructures in particular, can be suited to "beyond GDP societies".

It will give the opportunity to participants to thoroughly understand and discuss what is at stake and which research areas can be usefully explored in the short term so that suited applications and services, based on Information and Communication Technologies, can be available tomorrow.

Event structure

	9	10	11	12	13	14	15	16	17	18	19	20
Thursday, Jan. 22	Registration	Opening	Break	Session	Lunch		Session	Break	Session	Break	Cocktail	
Friday, Jan. 23		Session	Break	Session	Lunch		Session	Break	Closing	Open networking		

Thursday, January 22, will be mainly a high-level conference devoted to visions presented by supporting organisations and to contributions from worldwide experts in ICT and societal developments, addressing the various issues evoked above.

Friday, January 23, will be mainly a scientific workshop devoted to presentations and discussions related to the "PARADISO reference document" disseminated prior to the event, and will conclude with a roadmap on the next steps to take in order to efficiently build on event outputs and achieve concrete results in the short term.

Ample time will be left during the two days for information exchange and networking between participants, particularly during session breaks and a cocktail organised on Thursday 22.

Further information and registration

Please visit the www.paradiso-fp7.eu web site for further information on the event background, objectives, and programme and online registration (registration is free of charge but pre-registration is compulsory). A draft version of the PARADISO reference document is also available online.

Event programme

(tentative programme as of Sept. 3, 2008)

	Thursday, January 22	Friday, January, 23
9:00		
9:30	Welcome of participants	Welcome of participants
10:00		Workshop session 1 Viewpoint of DGs and Units <i>Chaired by Jacques Babot, European Commission</i>
10:30	Opening session <i>Chaired by Mario Campolargo, European Commission</i>	Contributions from DG Dev, DG Research (Environment, SSH,...) and DG Info Units (C2, D1, D3, H3, H4?)
11:00	V Reding, a MEP (A Wijkman?), BEPA (R Liddle?), J Stiglitz or K Annan or R Pachauri or Al Gore	
11:30	Tea/Coffee break	Tea/Coffee break
12:00	Conference session 1 Addresses from supporting organisations <i>Chaired by Roger Torrenti, PARADISO coordinator</i>	Workshop session 2 Feedback from the open consultation <i>Chaired by Roland Burger, Club of Rome</i>
12:30	OECD, ITU, Club of Rome (Ashok Khosla), World Future Council (Bianca Jagger), Forum for the future (Peter Madden), UNESCO	A selection of contributions received following the dissemination of the draft version of the PARADISO reference document
13:00		
13:30		
14:00	Lunch	Lunch
14:30		
15:00	Conference session 2 Addresses from worldwide experts <i>Chaired by Peter Jonhston, European Commission</i>	Workshop session 3 Open discussion with FIRE projects <i>Chaired by Fabrizio Sestini, European Commission</i>
15:30	Target list: Jared Diamond or Lester Brown, Vinton Cerf, Habib Sy, Jeremy Rifkin, a philosopher (Dominique Bourg?), an artist (Michelangelo Pistoletto?), Lynn St Amour	Open discussion with FIRE projects on the perspectives outlined in the PARADISO reference document
16:00		
16:30	Tea/Coffee break	Tea/Coffee break
17:00	Conference session 3 The vision of leading ICT constituencies <i>Chaired by Per Blixt, European Commission</i>	Closing session: Next steps <i>Chaired by Roger Torrenti and Jacques Babot</i>
17:30	Contributions from ETPs (NEM, NESSI, eMobility, ISI,...), FIA working groups, WWRF	Open networking
18:00		
18:30	Break	
19:00		
19:30	Networking Cocktail	
20:00		

THE KEY ROLE OF ICT TO ENSURE A SUSTAINABLE WORLD FUTURE

DRAFT VERSION OF THE PARADISO REFERENCE DOCUMENT
AUGUST 2008



European Commission
Information Society and Media



PARADISO IS A PROJECT SUPPORTED BY THE EUROPEAN COMMISSION (DG INFORMATION SOCIETY AND MEDIA)
UNDER THE FP7 RESEARCH FUNDING PROGRAMME

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ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
AU	African Union
BEPA	Bureau of European Policy Advisers
EIA	Energy Information Administration
ETP	European Technology Platform
ETSI	European Telecommunications Standards Institute
EU	European Union
FIA	Future Internet Assembly
FAO	Food and Agriculture Organization of the United Nations
FIRE	Future Internet Research and Experimentation
FP7	EU's 7 th framework programme for research and technological development
GAID	Global Alliance for ICT and Development
GDP	Gross Domestic Product
GNH	Gross National Happiness
GPI	Genuine Progress Indicator
HDI	Human Development Index
ICT	Information and Communication Technologies
IEA	International Energy Agency
IETF	Internet Engineering Task Force
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ITU	International Telecommunication Union
JTI	Joint Technology Initiative
MDG	Millennium Development Goals
NSF	National Science Foundation
OECD	Organisation for Economic Co-operation and Development
QoS	Quality of Service
SWB	Subjective Well-Being
TUAC	Trade Union Advisory Committee to the OECD
UN	United Nations
UNCTAD	United Nations Conference on Trade And Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP	United Nations Environment Programme
UNHCR	United Nations Human Development Report
WSIS	World Summit on the Information Society
WTO	World Trade Organization
WWRF	Wireless World Research Forum
WWF	World Wide Fund for Nature

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INTRODUCTION

The PARADISO project (see WWW.PARADISO-FP7.EU) launched with the support of the European Commission (DG INFORMATION SOCIETY AND MEDIA) aims at identifying strategic research directions on network and service infrastructures in the hypothesis of a disruptive paradigm concerning global societal developments.

This possible paradigm shift, which more and more analysts are evoking worldwide, is based on the vision that, in order to avoid major worldwide crises, all countries (developed, emerging, and developing ones) will need to agree, sooner or later, on an alternative way forward. The European Union is undoubtedly one of the best placed world powers to proactively promote this new concept of progress, based on revised social, environmental and economic objectives: a true sustainable development, a more sustainable economic growth, more equally shared resources, eventually the well-being of peoples around the world, measured through a new "beyond GDP" index related to the progress of societies.

Which ICT (Information and Communication Technologies) applications and services will be needed to support these new objectives? More precisely, which network and service infrastructures will have to be developed?

The PARADISO project, launched in March 2008 and run by SIGMA ORIONIS and the CLUB OF ROME (through its Italian Chapter: the Aurelio Peccei Foundation) will investigate this disruptive paradigm and identify the ICT research areas that have to be explored in this perspective.

The paradigm is being investigated - and the innovative research identified - through a study, "The PARADISO reference document", based to a large extent on the outputs of two international events organised by the project: a scientific workshop (on June 12-13, 2008 in Brussels) and an open conference (on January 22-23, 2009 in Brussels).

The present document is the very first version of the PARADISO reference document, prepared after the PARADISO scientific workshop. It will be extended in the second half of 2008, taking in particular into account the feedback from the participants in this workshop (see attendee list on next page), and the inputs received from other individuals and organisations, since the document will be made available in the public area of the [PARADISO WEB SITE](http://WWW.PARADISO-FP7.EU) for open consultation. A more substantial document will thus be prepared before the end of 2008 and discussed on the occasion of the PARADISO open conference of January 2009.

The final version of the document will be released following this conference and widely disseminated so that the key PARADISO messages (a foreseeable paradigm shift worldwide, the proactive role Europe can play to show the way to this other future, the central contribution ICT can bring to achieving revised economic, environmental and social objectives) can be conveyed to the largest community and eventually have an impact on the political agenda.

In the meantime, the PARADISO project stakeholders are considering options to build on these first modest achievements, and to further develop the activities of their cross-disciplinary and multi-stakeholder "think and action tank" addressing sustainable future issues with a focus on ICT. All options logically include a close connection with organisations involved in similar activities in Europe and worldwide, in order that synergies can be exploited and that the impact of all initiatives can be even greater and best serve the building of a true sustainable future for peoples around the world.

ROGER TORRENTI

PARADISO project coordinator

PARTICIPANTS IN THE PARADISO SCIENTIFIC WORKSHOP OF JUNE 12-13, 2008

Jacques Babot	European Commission	Belgium
Per Blixt	European Commission	Belgium
Roland Burger	Club of Rome	Italy
Mario Campolargo	European Commission	Belgium
Ping Chen	Beijing University	China
Ekaterina Chtcherbina		Germany
Florian Colceag	IRSCA Gifted Education	Romania
Guido-Henri de Couvreur	Mondo vzw	Belgium
Laura De La Cruz Camargo	European Commission	Belgium
Loris Di Pietrantonio	European Commission	Belgium
Johan Eksteen	The Meraka Institute of CSIR	South Africa
Piero Formica	Jonköping University	Sweden
Anastasius Gavras	Eurescom GmbH	Germany
Anne Marijke Geuzebroek	Dutch Association Club of Rome	The Netherlands
Andrea Glorioso	European Commission	Belgium
Jon Hall	OECD	France
Elmar Husmann	IBM	Germany
Peter Johnston	European Commission	Belgium
Takayoshi Kusago	Osaka University	Japan
Hyeo-eun Lee	IITA	South Korea
Tabea Lump	Orionis	France
Olavi Luotonen	European Commission	Belgium
Nic Marks	New Economics Foundation	United Kingdom
Moacyr Martucci	University of Sao Paulo	Brazil
Serge Miranda	University of Nice Sophia Antipolis	France
Jackie Olang	The African Academy of Sciences	Kenya
Krisztina Onodi	System Consulting Ltd	Hungary
Dimitri Papadimitriou	Alcatel-Lucent	Belgium
Melissa Pearce-Voyer	European Commission	Belgium
Olli Pitkänen	Helsinki University of Technology	Finland
Chris Preist	HP Laboratories	United Kingdom
Gwin Prins	London School of Economics	United Kingdom
Phuntsho Raptan	Center for Bhutan Studies	Bhutan
Leopold Reif	Hoffmann & Reif Consultancy	Germany
Thomas Schauer	Club of Rome	Austria
Fabrizio Sestini	European Commission	Belgium
Hubert Stijns	Omega Minus	Belgium
Roger Torrenti	Orionis	France
Georgios Tselentis	European Commission	Belgium
Hans van Willenswaard	Sathirakoses Nagapradipa Foundation	Thailand
Catalin Vatra	Association of Romania for the Club of Rome	Romania
Craig Warren Smith	University of Washington	United States
Raoul Weiler	Club of Rome	Belgium
Piotr Wiench	Warsaw Agricultural University	Poland
Gennaro Zezza	Università di Cassino	Italy
Gaston Zongo	Panos Institute West Africa	Senegal



EXECUTIVE SUMMARY

This summary will be elaborated at a later stage, ~~more precisely when the revised version of the present document, to be discussed at the PARADISO open conference of January 2009, will be prepared.~~

It is envisioned that an appropriate form for this summary could be a "manifesto" that would be proposed for endorsement to any organisations sharing the views expressed in it, so that the main conclusions of the PARADISO reference document can be more easily and widely disseminated and have a greater impact.

This manifesto would also be the basis of, or even directly serve as the main "statement" or "declaration" that would be expressed during the open conference, and publicised in the European media on this occasion.

THE WORLD IS CONFRONTED WITH PROFOUND CHANGES

During the twentieth century, and particularly during the last few decades, the world has experienced profound changes, and is today facing increasingly complex issues, ~~unprecedented in the history of mankind.~~

These changes have been driven by a number of facts and factors, many of them inter-correlated, the most important ones being probably the growth of the worldwide population (and the changes in its structure), the globalization of markets (trade, monetary, financial, and cultural aspects), the new balance of world power pushed by emerging economies, the increased use of world resources and of human impact on the environment, and the overwhelming dimension of Information and Communication Technologies.

The next paragraphs will focus on this set of facts and factors, and will not address other important facts (such as local or regional conflicts, the fall of the Berlin Wall, the collapse of USSR, or the events of 9/11) that definitely characterise the last decades and have contributed to profound geopolitical changes but are less relevant when considering the objectives of the present document.

POPULATION GROWTH AND STRUCTURAL CHANGES

The world population has been growing, since the beginning of the twentieth century, and more particularly since the 50's, at an unprecedented rate, reaching today a total of around 6,7 billion people (source [US CENSUS BUREAU](#)) and expected to reach around 9,5 billion people by 2050.

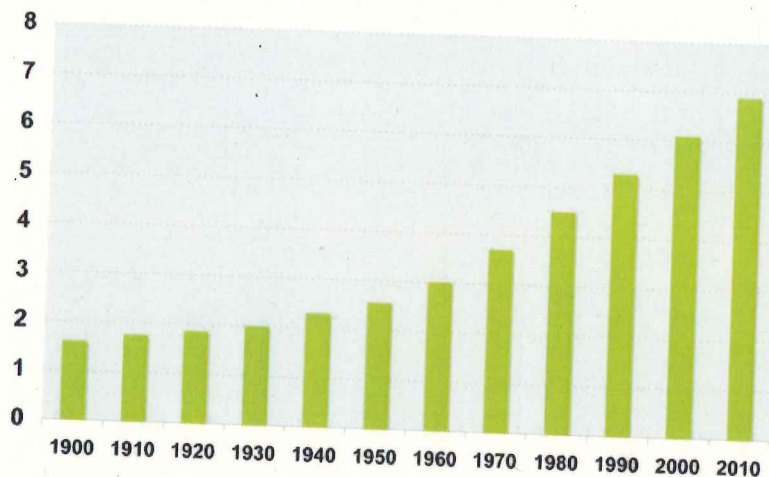


FIGURE 1: EVOLUTION OF THE WORLD POPULATION SINCE 1900 - US CENSUS BUREAU - 2008

This tremendous growth has been obviously influencing many other factors that will be analysed in following paragraphs, such as the increase in the use of agricultural and mineral resources, and the impact of human activity on the environment. Changes in the population world structure have been very important too:

- the greatest part of this growth occurred (see Figure 2) in less developed countries, a trend which is confirmed for the next decades (the [POPULATION REFERENCE BUREAU](#) foresees for instance that, over the period 2005-2050, the African population will increase by 117%, while the European population will decrease by 10%),
- the proportion of those living in urban areas (and particularly in urban areas of 10 million people or more) has significantly increased in the last decades (see Figure 3),
- under the effect of an increased life expectancy and of a decrease in birth rate, the age pyramid of developed countries entered a long-term structural change.

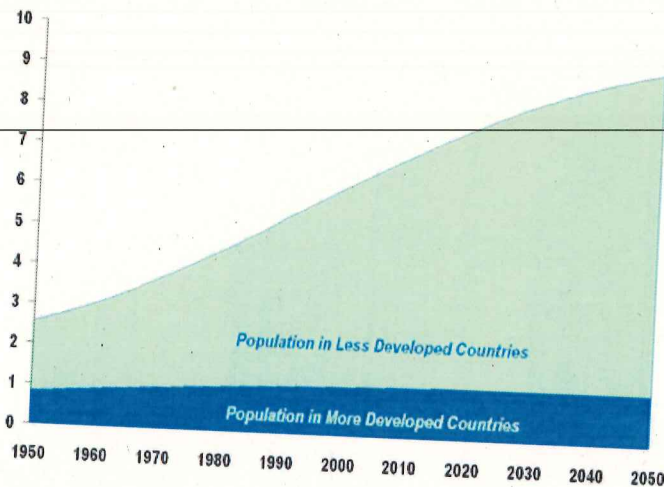


FIGURE 2: COMPARED POPULATION GROWTH OVER THE PERIOD 1950-2050 - POPULATION REFERENCE BUREAU - 2007

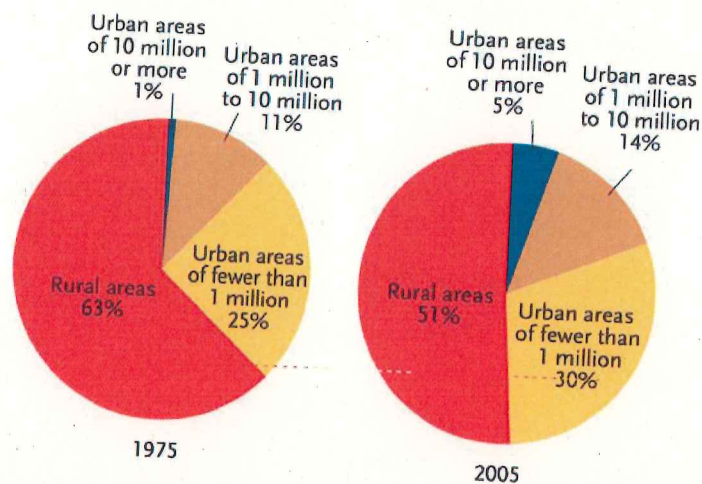


FIGURE 3: WORLD POPULATION LIVING IN URBAN AND RURAL AREAS - POPULATION REFERENCE BUREAU - 2007

MARKET GLOBALIZATION

International trade of industrial and agricultural products has developed at a very quick pace these last 50 years (see Figure 4), driven by advances in transport and communication, but first and foremost by the determination of governments to extend the reach of their markets, to build a world of more freedom (see for instance the EU vision of "four freedoms of movement": goods, services, people, and money).

Regional free trade agreements such as the one developed by the European Union, by the Association of Southeast Asian Nations, or more recently by the United States, Canada, and Mexico (NAFTA), and worldwide agreements (particularly the General Agreement on Tariffs and Trade - GATT - established in 1947, from which the [WORLD TRADE ORGANIZATION](#) - WTO - generated in 1995) are well-known drivers of these changes that do not include only today trade globalization but also, since the 90's, monetary, financial, and cultural globalization.

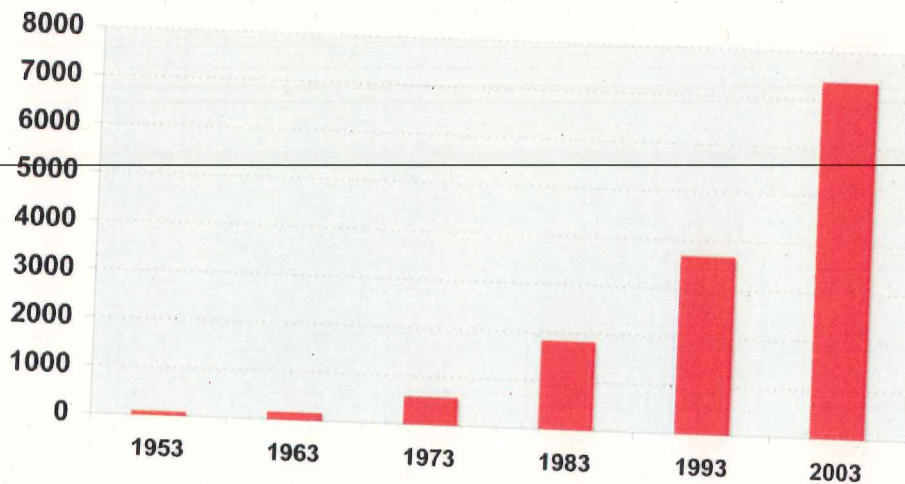


FIGURE 4: EVOLUTION OF WORLD MERCHANDISE EXPORTS (IN BILLION USD) SINCE 1953 - WTO - 2006

EMERGING ECONOMIES

Taking full advantage of market globalization, China has, over the last two decades, grown its economy at an impressive rate, followed by the other Asian giant, India, and also by Russia and Brazil, which has led **THE GOLDMAN SACHS GROUP** in 2003, to start identifying in their analyses the "BRIC countries" (Brazil, Russia, India, China), underlining in particular that their cumulated GDP should become higher than the one of the G7 countries (Canada, France, Germany, Italy Japan, UK, and USA) in less than 30 years from now.

The present and foreseen economic development of these emerging economies, and the one of the "Next Eleven" that Goldman Sachs has recently identified (Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey, and Vietnam), comes logically along with an increased financial and political role of all these countries in the global arena and has of course a direct influence on other changes analysed in this chapter, particularly on resources and environmental aspects addressed in the next paragraph.

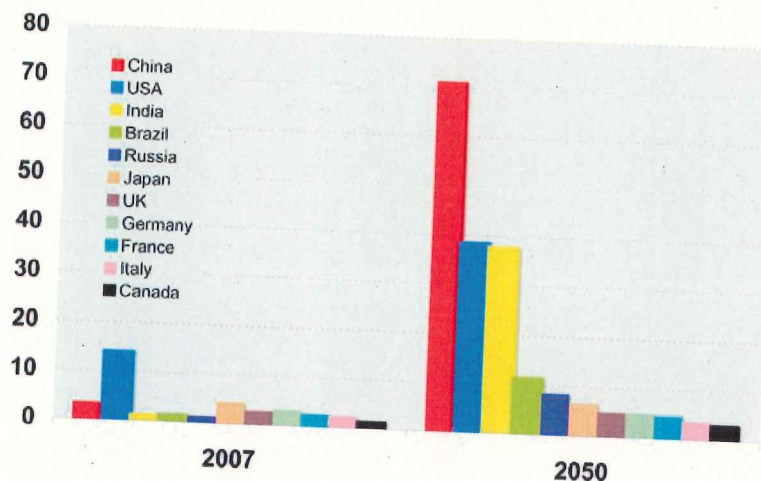


FIGURE 5: GDP OF BRIC AND G7 COUNTRIES FOR 2007 AND 2050 - GS DATA - 2007

INCREASED USE OF RESOURCES AND IMPACT ON THE ENVIRONMENT

The previous paragraphs have shown that, during the last 50 years, the world population has more than doubled, and that China and other emerging countries have known a very fast economic growth, facilitated by a quickly developing market globalization.

A logical consequence of this increased human activity is a very important increase in the use of earth resources, leading in particular (see figures 6 and 7) to serious stresses in the energy sector and first signs of water scarcity, and to some worrying anthropogenic effects on the environment (see figures 8 and 9), in particular concerning the production of greenhouse gases (and first of them CO₂), and the decline in biodiversity (and more generally the impact on natural systems, among them fisheries).

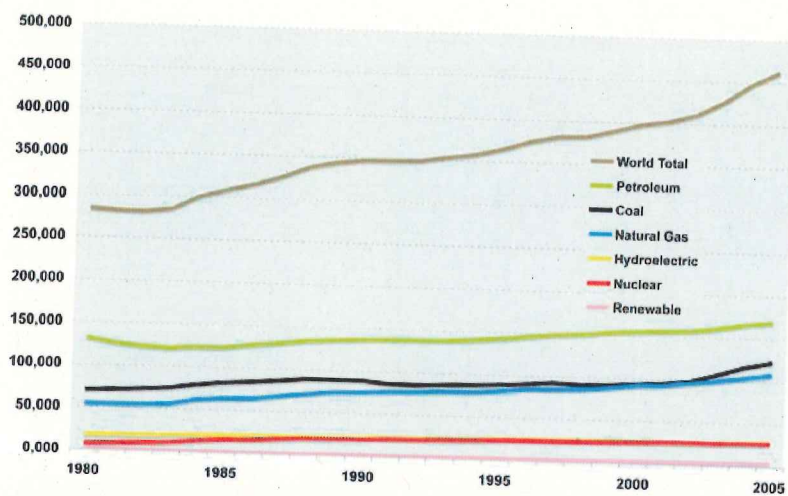


FIGURE 6: WORLD CONSUMPTION OF PRIMARY ENERGY SINCE 1980 (IN 10¹⁵ BTU) - EIA - 2007

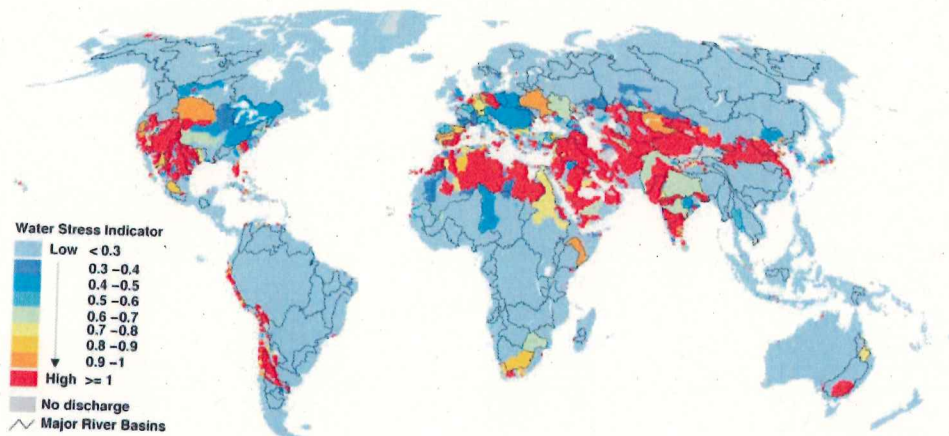


FIGURE 7: WATER STRESS INDICATOR - WORLD RESOURCES INSTITUTE - 2003

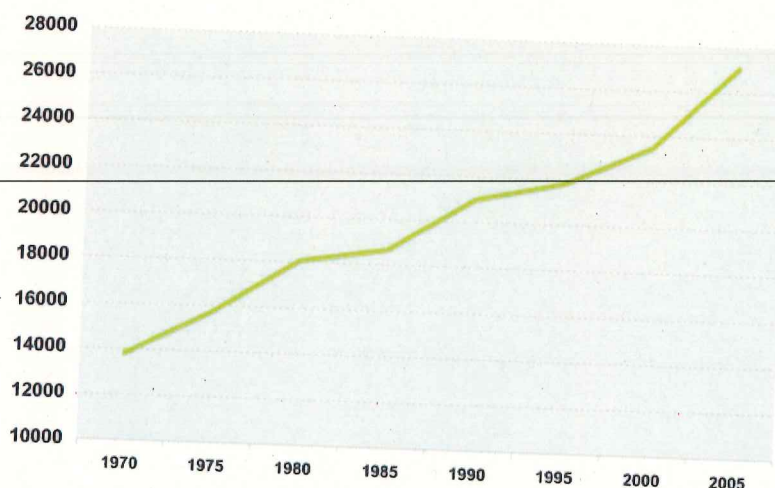


FIGURE 8: WORLD CO2 EMISSIONS - OECD DATA - 2008

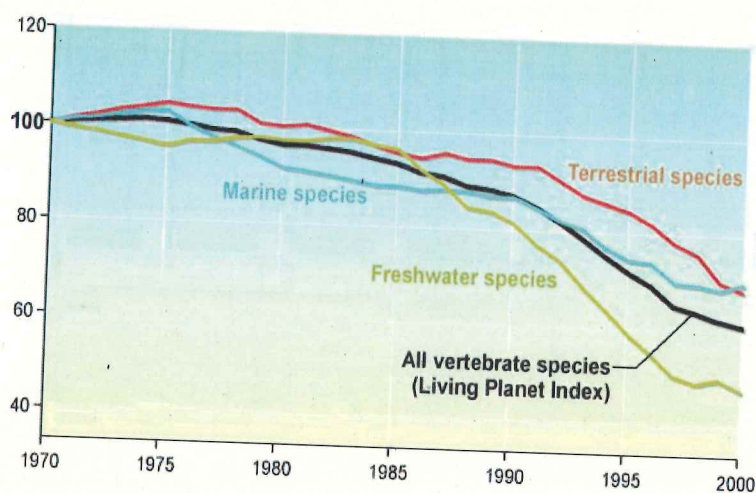


FIGURE 9: EVOLUTION OF THE LIVING PLANET INDEX SINCE 1970 - WWF - UNEP-WCMC

INFORMATION AND COMMUNICATION TECHNOLOGIES

The last fact and factor that will be analysed in the present chapter, the overwhelming dimension of the ICT domain, is not the least one, even if it not systematically referred to when addressing the profound changes the world has experienced in the last decades.

Information and Communication Technologies have indeed in less than twenty years totally changed the way people can communicate, access information and knowledge, work, play, cope with health and safety issues, produce wealth, govern, control energy, protect the environment, etc. and this not only in more developed, but also in less developed countries.

The role of ICT in today's and tomorrow's societies will be analysed in detail in another chapter. At this stage, let's only underline some figures:

- there are today around 1,5 billion Internet users in the world (nearly one fourth of the population),

- 3,5 billion people are mobile cellular telephone subscribers (over one half of the total population), China being the leading country with around 520 million subscribers, while over 1 billion mobile phones will be sold in 2008
- some recent Internet applications, such as **SKYPE** (voice over the Internet) or **FACEBOOK** (social networking), have expanded to hundreds of million users in just a couple of years.

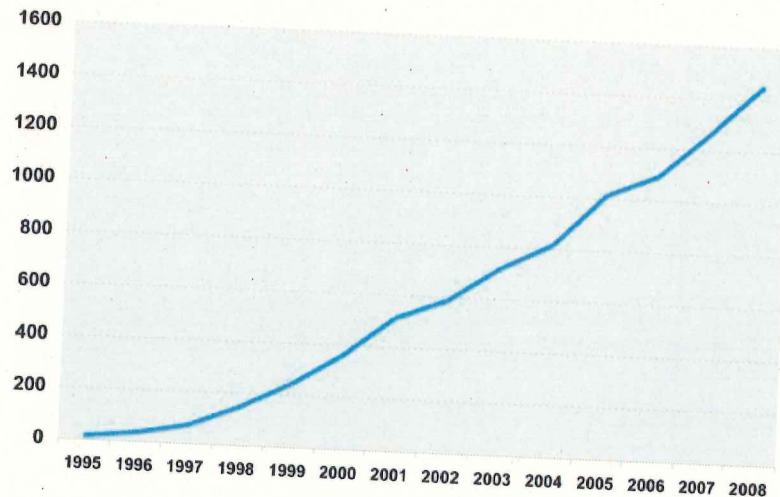


FIGURE 10: INTERNET USERS IN THE WORLD (IN MILLIONS) - GROWTH SINCE 1995 - INTERNET WORLD STATS - 2008

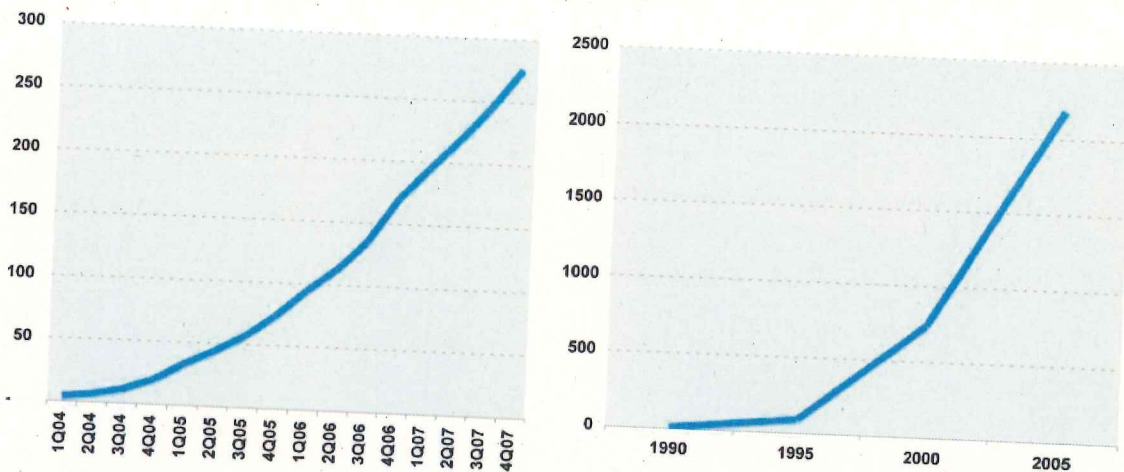


FIGURE 11: EVOLUTION OF SKYPE (LEFT) AND MOBILE PHONE USERS WORLDWIDE (IN MILLIONS) - OECD - 2008

HOW TO ENSURE A SUSTAINABLE FUTURE?

This chapter first acknowledges that a number of instances do exist today to cope with the changes introduced in the previous chapter and with other relevant challenges the world is facing today, in order to build a more sustainable future, and that, in these instances, beyond GDP issues are more and more frequently addressed.

It is then assessed that considering the risks of major breakdowns that exist today at the worldwide level (not only on environmental issues, but also on economic, financial, social, cultural issues), the present efforts that can be most often characterized by "business as usual" options are not appropriate, and that, sooner or later, all countries will have to agree on a disruptive paradigm concerning their societal developments, on an alternative way forward.

The scenarios for this foreseeable paradigm shift are investigated and the potential role the European Union can take to point the way to this other future is underlined.

MANY AREAS OF DIALOGUE

Let's start with the example of the **EUROPEAN UNION (EU)**, consisting in joint efforts of nations to build together an integrated area of peace and prosperity while contributing to addressing and solving world issues, a very good example in fact which, despite the various difficulties encountered since the 50's, has proven it could work and succeed extending its vision to even more nations.

All changes evoked in the previous paragraphs, at European and global levels, are of course fully integrated, since many years now, in EU's political agenda: taking into consideration the change in population structure, supporting an evolution of market globalization that can benefit Europe and all regions of the world, promoting consensus and action to reduce the impact of human activity on resources and the environment, developing an information society and, beyond, a knowledge based economy that can fully support employment and economic growth.

Other economic, social, and environmental objectives are of course part of EU's strategy for the future, and this not only for Europe but also worldwide, the EU being in particular the world's leading supplier in development aid, which remains so important today to support the efforts of developing countries to reduce poverty and undernourishment, to improve health, education, housing, to develop infrastructures and capacity building, etc.



FIGURE 12: UNDERWEIGHT CHILDREN (UNDER 5) - WORLDMAPPER – 2006

Territory size shows the proportion of all underweight children in the world that live there.

Beyond the [EU](#) (and similar instances such as [ASEAN](#), or more recently, the [AFRICAN UNION](#)), there are many other well-known multi-lateral consultation and governance bodies that address the challenges of today's world, either at a thematic or overall level: the [UN](#) (and its many organisations: [UNESCO](#), [FAO](#), [UNDP](#), [GAID](#), [UNEP](#), etc.) and [OECD](#), the [G8](#), the [WORLD BANK](#), [IMF](#), [WTO](#), the [WORLD ECONOMIC FORUM](#), etc.

The present document has not the ambition to synthesize all initiatives, programmes, decisions, perspectives referring to the above listed bodies but will, through the next paragraph, focus however of an aspect of them: the "beyond GDP" issue, which is part of an effort of these bodies and other organisations to support the development of a more sustainable future.

GOING BEYOND GDP

"It's time to go beyond GDP"

José Manuel Durão Barroso - President of the European Commission - 2007

Since a long time now, the Gross Domestic Product (GDP) per capita - an index slightly different from the Gross National Product (GNP) per capita - has been the main indicator to measure the progress of societies, even if it only characterizes their economic development. It measures in fact the wealth produced by a country and brings it down to the level of the individual citizen. The GDP ppp and GNP ppp per capita indexes, adjusting GDP / GNP to take into account the "purchasing power parity" (ppp), allow a more elaborate classification of countries (1 euro in one country having not the same value, in terms of purchasing power, as in another country).

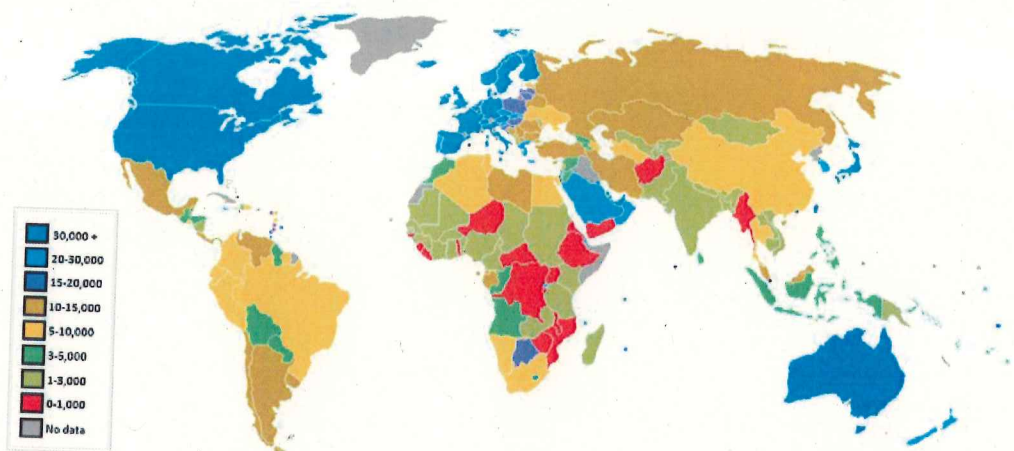


FIGURE 13: WORLD MAP OF GDP PPP PER CAPITA IN 2007-2008 (IMF - 2008)

Over the years, other indexes have however appeared, particularly to better evaluate the progress made, or to be achieved, in developing countries. The Human Development Index (HDI) is probably the best example of such new indexes: it has been developed under the aegis of the [UNITED NATIONS](#) (UN) in 1990 to extend the way development is measured and takes into account more than mere economic considerations (the HDI includes life expectancy and education).

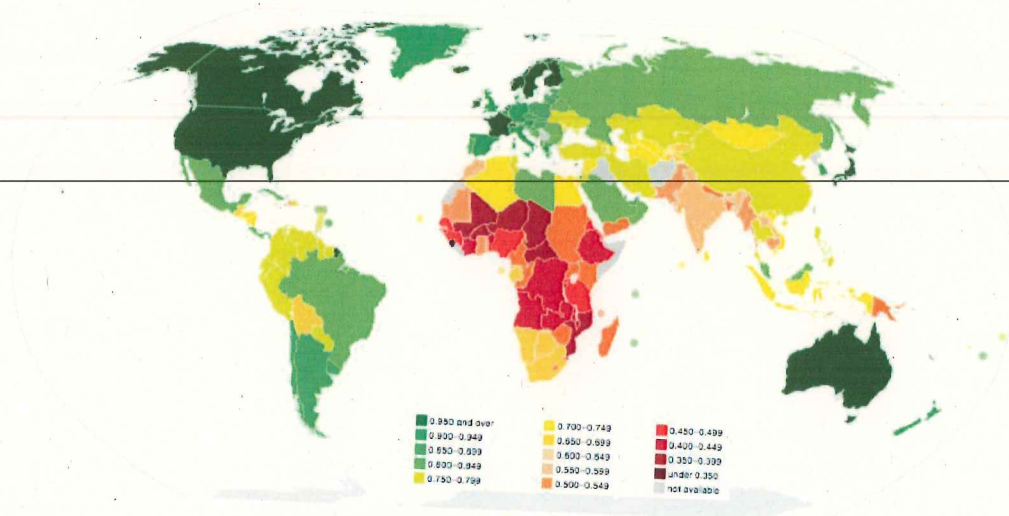


FIGURE 14: WORLD MAP OF HDI IN 2007 (UNHCR - 2008)

The **MILLENNIUM DEVELOPMENT GOALS** (MDG) going well beyond simple economic considerations, that the UN member States have agreed to try to achieve by 2015, deserve to be mentioned here as well. They include: halving extreme poverty and hunger, achieving universal primary education and gender equity, reducing under-five mortality and maternal mortality by two-thirds and three-quarters respectively, reversing the spread of HIV/AIDS, halving the proportion of people without access to safe drinking water and ensuring environmental sustainability, and developing a global partnership for development, with targets for aid, trade and debt relief.

In the last decades, a number of new indicators, sets of indicators or indexes have been put forward by research organisations, NGOs or even governments, advocating that time had come to truly go "beyond GDP", to find new ways to drive and measure the progress of societies, particularly when taking into account the profound changes, evoked in the previous chapter, that societies were now experiencing.

Integrating environmental issues in a new measure of progress has often driven these new approaches, such as the Index of Sustainable Economic Welfare (ISEW) proposed in the 80's, today referred to by **FRIENDS OF THE EARTH** and leading in the 90's to the development of the Genuine Progress Indicator (see reports and analyses of the **REDEFINING PROGRESS** NGO for further details), and the following joint statement by 400 leading economists, business leaders, and other professionals, including Nobel laureates:

"Since the GDP measures only the quantity of market activity without accounting for the social and ecological costs involved, it is both inadequate and misleading as a measure of true prosperity. Policy-makers, economists, the media, and international agencies should cease using the GDP as a measure of progress and publicly acknowledge its shortcomings. New indicators of progress are urgently needed to guide our society."

A well-known initiative of these last decades is the one explored since the 70's by the Kingdom of Bhutan (and more recently by the Thai government to support the implementation of a "sufficiency economy"). It concerns the Gross National Happiness (GNH) index, based on the vision that collective happiness should be the ultimate goal of governance. The **CENTER FOR BHUTAN STUDIES** is presently working on specifying in detail a set of indicators (then aggregated into a single index) in 9 GNH domains: psychological well-being, cultural diversity and resilience, education, health, time use and balance, good governance, community vitality, ecological diversity and resilience, living standards.