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Title: Building an Information Society Index: Creating a Qualitative Measure of
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Building an Information Society Index: Creating a Qualitative Measure of Access to Information

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The views expressed in this paper are those of the authors and do not necessarily reflect the opinions of the ITU or its Membership.



Why build an index?

- Track information society development within a country
- Highlight strengths and weaknesses
- Uncover regional trends
- Evaluate which policies have increased information access
- To assist with preparations for the World Summit on the Information Society

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Previous information society & other indices

ICT Indices

Group	What the index measures	Countries	Clusters	Vars	Weighting	Year
EIU	E-readiness Index	60	6	89	Varied	2002
ITU	Mobile/Internet Index	206	3	26	Averages	2002
Teligen	European Index Competitive Dev.	17	6	38	Varied	2002
UNCTAD	Index of ICT Diffusion	171	2	8	Averages	2002
UNDP	Technology Achievement Index	72	4	8	Averages	2001
WEF/Harvard	Networked Readiness	75	11	65	Varied	2002
World Paper	Information Society Index	55	4	23	Unknown	2002

Non-ICT Indices

Group	What the index measures	Countries	Clusters	Vars	Weighting	Year
UNDP	Human Poverty Index	90	3	4	Outliers	2001
Ginarte/Park	Index of Patent Rights	110	5	17	Averages	1997
Fraser Institute	Economic Freedom of the World	123	5	37	Prin Comp	2002

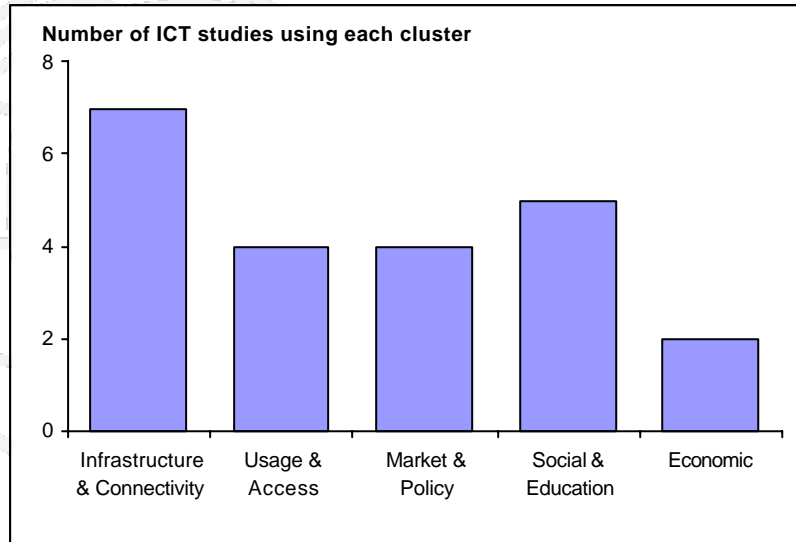


Five broad categories of clusters in previous studies

- Infrastructure and Connectivity
- Usage and Access
- Market and Policy
- Social and Education
- Economic



ICT cluster distribution



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Categories of clusters #1

- **Infrastructure and Connectivity**
 - **Infrastructure (ITU, WEF)**
 - **PSTN, ISDN, Mobile, Data services, ISP, Telecom industry (Teligen)**
 - **Computer, Internet, Information (World Paper)**
 - **Connectivity (EIU, UNCTAD, Mosaic)**
 - **Information infrastructure, Hardware/software support (WEF)**

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Categories of clusters #2 & #3

- **Usage and Access**
 - Usage/Network use (ITU, WEF)
 - Access (UNCTAD)
 - Pervasiveness, Dispersion, Sectoral absorption, (Mosaic)
- **Market and Policy**
 - Market Structure (ITU)
 - ICT Policy (WEF)
 - Legal and regulatory environment (EIU)
 - Organizational infrastructure (Mosaic)



Categories of clusters #4

- **Social and Education**
 - Human Skills (UNDP)
 - ICT opportunity, Social capital, Networked learning, E-government (WEF)
 - Social and cultural infrastructure (EIU)
 - Social (World Paper)
 - Creation of Technology, Diffusion of innovations (Old and Recent) (UNDP)
 - Sophistication of use (Mosaic)



Categories of clusters #5

- **Economic**
 - **Business environment, E-commerce consumer and business adoption, E-commerce, Supporting e-services (EIU)**
 - **Bus/Econ Environment, E-commerce (WEF)**



Strengths of earlier studies

- **Transparent**
 - **Simple averages for weights**
 - **Straight-forward variable selection**
- **Break ICT development into 5 broad but manageable groups**
- **Cover a wide range of countries**



Weaknesses of earlier studies

- **Data issues**
 - Unreliable data (e.g. Internet hosts)
 - High correlations among variables
 - Survey data rather than quantitative measures
- **Methodology issues**
 - Weighting is often arbitrary
 - Inappropriate number of variables
 - No standardized scoring from year to year (relative vs. absolute indices)



Proposals

- **Build an index using a combination of proven clusters**
- **Use 25-35 quantitative variables, with broad geographical coverage and long-time-series**
- **Use stable data sources (not based on opinion surveys)**
- **Use statistical tools to fix methodological problems inherent in indices**



Proposed Information Society Index

- 1. Infrastructure and markets**
 - Infrastructure and connectivity
 - Market structure and private sector participation
- 2. Access and usage**
 - Usage
 - Media, content and press
 - Gender
- 3. Education and innovation**
 - Education
 - Literacy
 - Science, technology and innovation



1. Infrastructure and Markets

Telecom Infrastructure

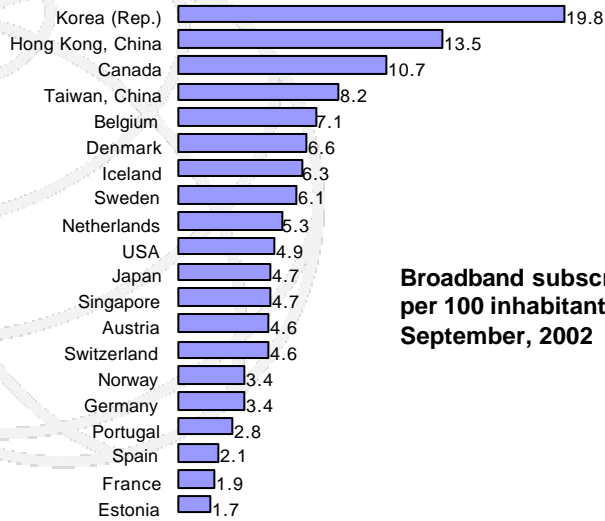
- 1.1 Fixed telephone lines per 100 inhabitants (ITU)
- 1.2 Mobile subscribers per 100 (ITU)
- 1.3 PCs per 100 (ITU)
- 1.4 Radios per 100 (UNESCO/ITU)
- 1.5 Televisions per 100 (ITU)
- 1.6 Broadband subscribers per 100 (ITU)

Markets

- 1.7 Level of private sector participation**
 - 1.7.1 Fixed-line networks
 - 1.7.2 Mobile networks
- 1.8 Level of competition (market structure)**
 - 1.8.1 Local calls (ITU)
 - 1.8.2 Long distance calls (ITU)
 - 1.8.3 international calls (ITU)
 - 1.8.4 Mobile services (ITU)
 - 1.8.5 Leased lines (ITU)
 - 1.8.6 Internet Service Providers (ITU)



1.6 Broadband subscribers



Broadband subscribers per 100 inhabitants, September, 2002

Source: ITU .



2. Usage and Access

Usage

- 2.1 Estimated Internet Users per 100 (ITU)
- 2.2 International bandwidth per Internet User (ITU/TeleGeography)
- 2.3 International traffic (in+out) / per capita (ITU/TeleGeography)

Media

- 2.4 Daily newspapers per 100 (UNESCO/World Bank)
- 2.5 Number of public libraries per 100 (UNESCO)

Content

- 2.6 Online Newspapers per 100 (ITU)
- 2.7 Secure Servers per 100 (Netcraft)

Press

- 2.8 Press freedom (Freedom House)

Gender

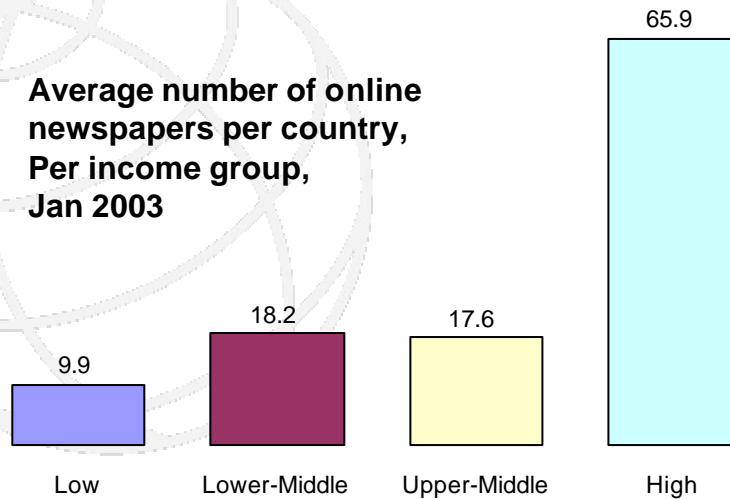
- 2.9 Gender Related Development Index (UNDP)



2.6 Online newspapers

Average number of online newspapers per country, Per income group, Jan 2003

Source: ITU.



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3. Education and Innovation

Education

- 3.1 Primary gross enrolment ratio (UNESCO/World Bank)
- 3.2 Secondary gross enrolment ratio (UNESCO/World Bank)
- 3.3 Tertiary gross enrolment ratio (UNESCO/World Bank)

Literacy

- 3.4 Adult literacy rate (UNDP)
- 3.5 Youth literacy rate (UNDP)
- 3.6 Literacy Gender Parity Index (World Bank)

Science, Technology and Innovation

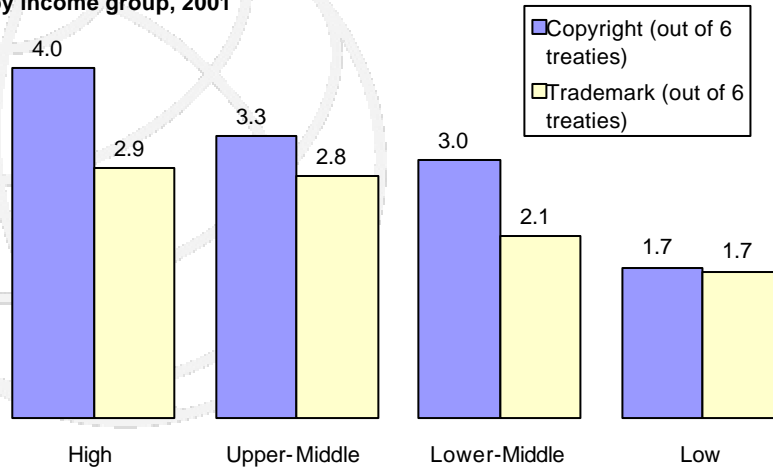
- 3.7 Patent applications filed, per capita (WIPO/World Bank)
- 3.8 Intellectual Property Protection Index
 - 3.8.1 Patent Protection Index (Park & Ginarte 1997)
 - 3.8.2 Copyright Protection Index (Reynolds 2003)
 - 3.8.3 Trademark Protection Index (Reynolds 2003)

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3.8 Intellectual Property

Average number of international IPR treaties signed, by country, by income group, 2001



Source: Reynolds (2003).



Selected statistical tools to measure robustness

- Spearman Rank Test
 - Test robustness of rankings based on different weighting schemes
- Factor analysis to determine weights
 - Following IMD, Fraser Institute indices
- Formulas that emphasize outliers
 - Adapt UNDP's Human Poverty Index measure to change weights for outliers

$$HPI - 1 = \left(\frac{1}{3} [P_1^\alpha + P_1^\alpha + P_1^\alpha] \right)^{\frac{1}{\alpha}}$$



Timetable

- **Spring 2003**
 - 2001 data collection & cleaning
 - Initial runs and weighting tests
- **Summer 2003**
 - Introduction of new (2002) data as it arrives
 - Data cleaning and normalization
- **September 2003**
 - Publication of index using most current data
 - Presentation at WSIS '03
- **Further refinement and updating**

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Thank you

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