Statistics in perspective:
ITU’s Digital Access Index (DAI) and Internet Case Studies

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ITU Digital Access Index

Access Indicators for the Information Society

• Measuring Access to ICTs
• ICTs in Business, Education and Government
• ICTs and the Millennium Development Goals
• The Digital Access Index
What is the DAI?

The DAI ranks 178 countries according to their ability to access Information and Communication Technologies (ICT).
Why an index?

A selection of indicators compiled into an index gives a better overview than any single indicator.
Why another ICT index?

- Almost all existing ICT indices concentrate primarily on developed economies.
- Some do not use internationally comparable indicators and some have methodological snags or are susceptible to distortions due to the use of qualitative variables.
- Most are not specifically targeted at measuring ICT access.
- Wherever these indices use too many variables, transparency compromised.
Digital Access Index

- **ITU expertise:**
  - Leading source of ICT data
  - Analysis and research strength
- **Inclusive:**
  - 178 economies, most of any other ICT index
- **Transparent:**
  - 5 categories, 8 indicators, easy to decode
- **Classifications:**
  - High, upper, medium, low
- **Flexibility:**
  - gender sub-index
  - national indices
  - index over time

**USAGE**
- Internet users

**QUALITY**
- Literacy
- School enrolment
- International Internet bandwidth
- Broadband subscribers

**INFRA-STRUCTURE**
- Fixed telephone subscribers
- Mobile cellular subscribers
- Internet access price

**AFFORDABILITY**
- Internet users
### Compiling DAI: Korea (Rep.)

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Korea (Rep.)</th>
<th>÷ Goal-post</th>
<th>= Indicator</th>
<th>* Weight</th>
<th>= Index value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure</td>
<td>1. Fixed telephone subscribers per 100 inhabitants</td>
<td>48.6</td>
<td>60</td>
<td>0.81</td>
<td>½</td>
<td>0.40 + 0.34</td>
</tr>
<tr>
<td></td>
<td>2. Mobile cellular subscribers per 100 inhabitants</td>
<td>67.9</td>
<td>100</td>
<td>0.68</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>2. Affordability</td>
<td>3. 1 – (Internet access price as percentage of per capita income)</td>
<td>98.8</td>
<td>100</td>
<td>0.988</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3. Knowledge</td>
<td>4. Adult literacy</td>
<td>97.9</td>
<td>100</td>
<td>0.98</td>
<td>2/3</td>
<td>0.65 + 0.30</td>
</tr>
<tr>
<td></td>
<td>5. Combined primary, secondary and tertiary school enrolment level</td>
<td>91.0</td>
<td>100</td>
<td>0.91</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>4. Quality</td>
<td>6. International Internet bandwidth (bits) per capita</td>
<td>362</td>
<td>10'000</td>
<td>0.74</td>
<td>½</td>
<td>0.37 + 0.37</td>
</tr>
<tr>
<td></td>
<td>7. Broadband subscribers per 100 inhabitants</td>
<td>21.9</td>
<td>30</td>
<td>0.73</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>5. Usage</td>
<td>8. Internet users per 100 inhabitants</td>
<td>55.2</td>
<td>85</td>
<td>0.65</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### Digital Access Index (Average of 5 categories above) 0.82

**Note:** a) Because of the large spread of values among economies, a logarithm is used to calculate this value: 

\[
\text{LOG} (1'867) - \text{LOG} (0.01) / \text{LOG} (10'000) - \text{LOG} (0.01)
\]
**Rationale for goalposts: Where ICTs are headed**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main telephone lines per 100 inhabitants</td>
<td>60 The highest value was 69.3, by Sweden in 1998. This has since declined to 65.3 in 2002.</td>
</tr>
<tr>
<td>Mobile subscribers per 100 inhabitants</td>
<td>100 The value of 100 has already been reached by two economies: Luxembourg and Taiwan, China.</td>
</tr>
<tr>
<td>Literacy &amp; School enrolment</td>
<td>100 The UNDP establishes these values</td>
</tr>
<tr>
<td>Internet access price as percent of GDP per capita</td>
<td>100 It is not possible to spend more than one earns on Internet access.</td>
</tr>
<tr>
<td>Broadband subscribers per 100 inhabitants</td>
<td>30 The Republic of Korea leads the world with 21 broadband subscriptions per 100 inhabitants at the end of 2002. At a level of 30 per 100 inhabitants, more than 90 percent of households would have broadband.</td>
</tr>
<tr>
<td>International Internet bandwidth per capita</td>
<td>10’000 This level has already been exceed in three countries most notably Denmark where the value is more than twice the goalpost.</td>
</tr>
<tr>
<td>Internet users per 100 inhabitants</td>
<td>85 The highest value for Internet penetration over the entire population in Iceland with a rate of 65 (81 percent of of those between age 12-80). A goalpost of 85 implies that all in that age range are using the Internet.</td>
</tr>
</tbody>
</table>
# Top 10

<table>
<thead>
<tr>
<th>Rank</th>
<th>Economy</th>
<th>Infrastructure</th>
<th>Affordability</th>
<th>Knowledge</th>
<th>Quality</th>
<th>Usage</th>
<th>DAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sweden</td>
<td>0.94</td>
<td>0.99</td>
<td>0.99</td>
<td>0.64</td>
<td>0.67</td>
<td>0.847</td>
</tr>
<tr>
<td>2</td>
<td>Denmark</td>
<td>0.89</td>
<td>0.99</td>
<td>0.99</td>
<td>0.66</td>
<td>0.60</td>
<td>0.828</td>
</tr>
<tr>
<td>3</td>
<td>Iceland</td>
<td>0.89</td>
<td>0.99</td>
<td>0.96</td>
<td>0.50</td>
<td>0.76</td>
<td>0.820</td>
</tr>
<tr>
<td>4</td>
<td>Korea (Rep.)</td>
<td>0.74</td>
<td>0.99</td>
<td>0.96</td>
<td>0.74</td>
<td>0.65</td>
<td>0.817</td>
</tr>
<tr>
<td>5</td>
<td>Norway</td>
<td>0.84</td>
<td>0.99</td>
<td>0.99</td>
<td>0.55</td>
<td>0.59</td>
<td>0.793</td>
</tr>
<tr>
<td>6</td>
<td>Netherlands</td>
<td>0.78</td>
<td>0.99</td>
<td>0.99</td>
<td>0.61</td>
<td>0.60</td>
<td>0.792</td>
</tr>
<tr>
<td>7</td>
<td>Hong Kong, China</td>
<td>0.93</td>
<td>1.00</td>
<td>0.83</td>
<td>0.68</td>
<td>0.51</td>
<td>0.790</td>
</tr>
<tr>
<td>8</td>
<td>Finland</td>
<td>0.81</td>
<td>0.99</td>
<td>0.99</td>
<td>0.55</td>
<td>0.60</td>
<td>0.786</td>
</tr>
<tr>
<td>9</td>
<td>Taiwan, China</td>
<td>0.98</td>
<td>0.99</td>
<td>0.95</td>
<td>0.56</td>
<td>0.45</td>
<td>0.786</td>
</tr>
<tr>
<td>10</td>
<td>Canada</td>
<td>0.69</td>
<td>0.99</td>
<td>0.97</td>
<td>0.64</td>
<td>0.60</td>
<td>0.779</td>
</tr>
<tr>
<td>11</td>
<td>United States</td>
<td>0.74</td>
<td>0.99</td>
<td>0.97</td>
<td>0.54</td>
<td>0.65</td>
<td>0.778</td>
</tr>
<tr>
<td>24</td>
<td>Slovenia</td>
<td>0.78</td>
<td>0.97</td>
<td>0.94</td>
<td>0.44</td>
<td>0.44</td>
<td>0.716</td>
</tr>
</tbody>
</table>
Reversal of fortune

Change in rank relative to 40 economies

<table>
<thead>
<tr>
<th>Country</th>
<th>DAI 1998</th>
<th>Change</th>
<th>DAI 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>0.60</td>
<td>-9</td>
<td>0.72</td>
</tr>
<tr>
<td>Australia</td>
<td>0.61</td>
<td>-8</td>
<td>0.74</td>
</tr>
<tr>
<td>United States</td>
<td>0.66</td>
<td>-5</td>
<td>0.78</td>
</tr>
<tr>
<td>Canada</td>
<td>0.66</td>
<td>-5</td>
<td>0.77</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.61</td>
<td>-3</td>
<td>0.77</td>
</tr>
<tr>
<td>Japan</td>
<td>0.58</td>
<td>+4</td>
<td>0.75</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.56</td>
<td>+5</td>
<td>0.75</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>0.59</td>
<td>+6</td>
<td>0.79</td>
</tr>
<tr>
<td>Taiwan, China</td>
<td>0.56</td>
<td>+13</td>
<td>0.78</td>
</tr>
<tr>
<td>Korea (Rep.)</td>
<td>0.55</td>
<td>+20</td>
<td>0.81</td>
</tr>
</tbody>
</table>
ITU Internet Case Studies

www.itu.int/ict/cs
Case Studies

- [www.itu.int/ict/cs](http://www.itu.int/ict/cs)
- Launched in 2000
- Total of 21 studies (until end 2003)
Case Studies

- Overview of studies
  - Country Overview
  - Telecom sector
  - Media sector
  - Internet market
  - Use in government, health, education and business
  - Recommendations

- Since 2002: emphasis on information society readiness
Framework for benchmarking: Mosaic

- Pervasiveness
- Geographic Dispersion
- Sectoral Absorption
- Connectivity Infrastructure
- Organizational Infrastructure
- Sophistication of Use
Benchmarking SIDS (2003)

Pervasiveness

Sophistication

Organizational

 Dispersion

Absorption

Connectivity

Mauritius

Maldives
Benefits of Case Studies

• To understand the ‘whys’ and ‘hows’ of ICT (why is a country at a certain level of ICT and how can it improve its situation?) it is necessary to look behind the pure ICT statistics
  – Education/literacy
  – Affordability
  – Language, content

• Important issues that most countries face: definition of statistics (Internet users, for example)
  – Data is often not comparable

• Data often exists but is not disseminated

• Coordination between government agencies but also development agencies on data collection/dissemination
Korea Internet Case Study

- The Korean *Miracle*
- Highlight achievements & Identify success factors
- Lessons to be learned by other countries
- Uncover flaws in statistics
<table>
<thead>
<tr>
<th>Informatization Index 50 countries</th>
<th>EIU e-readiness 60 countries</th>
<th>World Competitiveness 49 countries</th>
<th>Information Society Index 55 countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>1</td>
<td>USA</td>
<td>USA</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6</td>
<td>Switzerland</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Korea</td>
<td>17</td>
<td>Korea</td>
<td>Korea</td>
</tr>
</tbody>
</table>

Source: ITU adapted from NCA, EIU, IMD and IDC.
Flaws in statistics

Fixed telephone lines per 100 inhabitants

- With ISDN channels
- Without ISDN channels

Mobile cellular subscribers per 100 inhabitants

- Total
- Subscription based

Switzerland  Korea
Exporting Korea’s miracle – some lessons to be learned

• Commit resources for education. Providing ICTs to educational institutions and enhancing ICT training is essential ( = major gov’t policy)
• Competitive pressure of alternative broadband technologies (license cable TV and high-speed wireless access)
• Incomes from license fees remain in the ICT sector to finance public networks
Thank You.

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