Module 2
Components of the United Nations
e-government development index
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By the end of this module you will learn:

A. What is the United Nations e-government development index (EGDI)
B. What is the online service index (OSI)
C. What is the telecommunication infrastructure index (TII)
D. What is the human capital index (HCI)
A. What is the United Nations e-government development index (EGDI)?

The UN e-government development index (EGDI) is a composite index based on the weighted average of three normalized indices where 1/3 is derived from a telecommunications infrastructure index, 1/3 from a human capital index, and 1/3 from the online service index. The combined EGDI score gives an indication of e-government development across the 193 UN Member States relative to each other as opposed to being an absolute measure with a finite goal.

The assessment rates the e-government performance of countries relative to one another as opposed to being an absolute measurement.
What are the components of the United Nations e-government development index (EGDI)?

Mathematically, the EGDI is a weighted average of three normalized scores on three most important dimensions of e-government, namely: scope and quality of online services (online service index, OSI), development status of telecommunication infrastructure (telecommunication infrastructure index, TII), and inherent human capital (human capital index, HCI).
Where do we get the 3 EGDI components from?

The UN e-government development index is a composite indicator measuring the willingness and capacity of Public Administration to use ICT to deliver public services.

\[
\text{EGDI} = \left( \frac{1}{3} \text{OSI} + \frac{1}{3} \text{TII} + \frac{1}{3} \text{HCI} \right)
\]

- **OSI** = online service index *(DESA)*
- **TII** = telecommunication infrastructure index *(ITU)*
- **HCI** = human capital index *(UNESCO-UNDP)*
B. What is the online service index (OSI)

The online service index (OSI) is based upon a four-stage model, which is ascending in nature and builds upon the previous level of sophistication of a state’s online presence.

Emerging Presence: offering basic information online...

Enhanced Presence: greater sources, e-tools, e-services of...

Transactional Presence: two ways interactive applications, financial and non financial transactions ...

Connected Presence: WoG, full interoperability, G2G, G2C, C2G ...
What is Stage I in the online service index?

I. Emerging Presence

• Is Stage I representing information, which is limited and basic;
• E-government online presence comprises a web page and/or an official website; links to basic ministries/departments may/may not exist; links to regional/local government may/may not exist;
• Some archived information such as the head of states' message or a document such as the constitution may be available online;
• Most information remains static with the fewest options for citizens.
II. Enhanced Presence

• Is Stage II in which the government provides greater public policy and governance sources of current and archived information, such as policies, laws and regulation, reports, newsletters, and downloadable databases;
• User can search for a document and there is a help feature and a site map provided;
• Larger selection of public policy documents such as an e-government strategy, policy briefs on specific education or health issues;
• Though more sophisticated, the interaction is still primarily unidirectional with information flowing essentially from government to the citizen.
What is Stage III in the online service Index?

III. Transactional Presence

- Stage III that allows two-way interaction between the citizen and his/her government;
- It includes options for paying taxes; applying for ID cards, birth certificates/passports, license renewals and other similar C2G interactions by allowing him/her to submit these online 24/7;
- Citizens are able to pay for relevant public services, such as motor vehicle violation, taxes, fees for postal services through their credit, bank or debit card;
- Providers of goods and services are able to bid online for public contacts via secure links.
What is Stage IV in the online service index?

IV. Connected Presence

• Is Stage IV which represents the most sophisticated level in the online e-government initiatives;
• It can be characterized by an integration of G2G, G2C and C2G (and reverse) interactions;
• Government encourages participatory deliberative decision-making and is willing and able to involve the society in a two way open dialogue;
• Through interactive features such as the web comment form, and innovative online consultation mechanisms, the government actively solicits citizens’ views on public policy, law making, and democratic participatory decision making.
What sources do we use for the online service index (OSI)?

Member States are sent an invitation to provide information regarding their website addresses (URL) for different government ministries and the national portal(s) through a questionnaire. Information was also requested with regards to URLs for open government data, e-participation and the designated authority in charge of e-government policies.
How do we gather information for the online service index (OSI)?

A Quantitative Approach for a Qualitative Assessment
What are the challenges in reviewing a country’s online presence

- Selecting the appropriate site/URL at the national level
- Some countries have adopted a different approach to their online e-government portal, through utilizing multiple websites for different topics
- Number of languages
- Maintaining high and reliable data quality
- E-Literacy and citizens’ ability to use ICT to access online public services
- Assessment of the challenges large countries face, as opposed to smaller countries (both in terms of land mass and population)
C. What are the indicators in the telecommunication infrastructure index (TII)

The telecommunication infrastructure index (TII) is an arithmetic average composite of the following indicators:

**2012 Subcomponents**
- estimated internet users per 100 inhabitants
- number of main fixed telephone lines per 100 inhabitants
- number of mobile subscribers per 100 inhabitants
- Fixed internet subscriptions per 100 inhabitants
- and number of fixed broadband facilities per 100 inhabitants

**2014 Subcomponents**
- estimated internet users per 100 inhabitants
- number of main fixed telephone lines per 100 inhabitants
- number of mobile subscribers per 100 inhabitants
- and number of fixed broadband facilities per 100 inhabitants
- number of wireless broadband subscriptions per 100 inhabitants
What sources do we use for the telecommunication infrastructure index (TII)

The International Telecommunication Union (ITU) is the primary source of data in each case. The wireless broadband subscription parameter was added this year instead of fixed internet subscription per 100 inhabitants. The new component reflects the development of telecommunications around the world.
How is the telecommunication infrastructure index (TII) calculated?

Telecommunication infrastructure is a composite value =

Average internet user Z-score + Average telephone line Z-score + Average mobile subscription Z-score + Average wireless broadband subscription Z-score + Average fixed broadband Z-score = Telecommunication infrastructure index
How is the TII score done mathematically?

• The telecommunication infrastructure composite value is normalized by taking its value for a given country, subtracting the lowest composite value in the survey and dividing by the range of composite values for all countries.

• For example, if country “x” were to have the composite value of 1.3813, with the lowest composite value for all countries equal to -1.1358 and the highest equal to 2.3640, then the normalized value of telecommunication infrastructure index for country “x” would be given by:

\[
\text{Telecommunication infrastructure index} = \frac{[1.3813 - (-1.1358)]}{[2.3640 - (-1.1358)]} = 0.7192
\]
D. What is the human capital index (HCI)?

The concept of human capital recognizes that education, experience and abilities of a citizen have an economic value for governments and for the economy as a whole. Experience of implementing e-government has shown us that people are one of the critical success factors which makes or mars the success of an e-government initiative. Political leaders and policy makers are starting to recognize that having educated citizens who have the right skill sets, knowledge, aptitudes and motivation can make a significant difference.
How do we get the human capital index (HCI)?

The human capital index is a weighted average composite of four indicators:
1. Adult literacy rate (%);
2. Combine primary, secondary and tertiary gross enrolment ratio (%);
3. Expected years of schooling;
4. Mean of years of schooling.

UNESCO is the main source of data for the human capital index.

All data gaps were filled either using data firstly from UNDP; secondly from the World Bank; thirdly from national sources; and finally, when all previous measures proved unsuccessful, data from the 2012 Human Capital Index was used.
How is the human capital index (HCl) calculated?

• Similar to calculating the telecommunication infrastructure index, each of the four component indicators is first standardized via the Z-score procedure to derive the Z-score value for each component indicator.

• The human capital composite value for country “x” is the weighted arithmetic mean with one third weight assigned to adult literacy rate and two ninth weight assigned to the gross enrolment ratio, estimate years of schooling, and mean years of schooling derived this way:

  \[
  \frac{1}{3} \text{adult literacy rate Z-score} + \frac{2}{9} \text{gross enrollment Z-score} + \frac{2}{9} \text{estimated years of schooling Z-score} + \frac{2}{9} \text{mean years of schooling Z-score}
  \]

  Human capital composite value
How is the human capital index (HCI) calculated?

• Then, the human capital composite value is normalized by taking its composite value for a given country, subtracting the lowest composite value in the Survey, and dividing by the range of composite values for all countries.

• For example, if country “x” were to have the composite value at 0.8438, with the lowest composite value for all countries equal to -3.2354 and the highest equal to 1.2752, then the normalized value of human capital index for country “x” would be given by:

\[
\text{Human Capital Index (Country “X”)} = \frac{0.8438 - (-3.2354)}{1.2752 - (-3.2354)} = 0.9044
\]
1. **What are the three components of the e-government development index?**
   a) Online Service Index, Human Capital Index and Nasdaq Composite Index
   b) Telecommunication Infrastructure Index, Online Service Index and Human Capital Index
   c) Online Service Index, AMEX Network Index and Nasdaq Composite Index

2. **How does the assessment rate the e-government performance of countries?**
   a) As an absolute value
   b) In level of income
   c) Relative to one another
   d) In regions

3. **The Online Service Index is based upon how many stages?**
   a) 6
   b) 2
   c) 4
   d) 5

4. **What is the primary source of data in the telecommunication infrastructure index?**
   a) World Bank
   b) United Nations Development Programme (UNDP)
   c) United Nations Educational, Scientific, and Cultural Organization (UNESCO)
   d) International Telecommunication Union (ITU)
Congratulations!

You have reached the end of this module.

To summarize what has been covered:

A. The UN e-government development index (EGDI) is a composite index based on the weighted average of three normalized indices where 1/3 is derived from a telecommunications infrastructure index, 1/3 from a human capital index, and 1/3 from the online service index.

B. The online service index is based upon a four-stage model, which is ascending in nature and builds upon the previous level of sophistication of a state’s online presence. (I. Emerging, II. Enhanced, III. Transactional, IV. Connected).

C. The telecommunication infrastructure index is a composite weighted average index of five primary indices based on basic infrastructural indicators, which define a country’s ICT infrastructure capacity.

D. The human capital index is a weighted average composite of four indicators: adult literacy rate, combined primary, secondary, and tertiary gross enrolment ratio, estimated years of schooling, and mean years of schooling.