Assessing e-readiness:
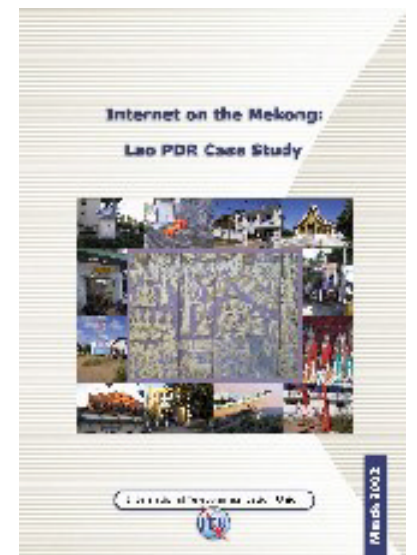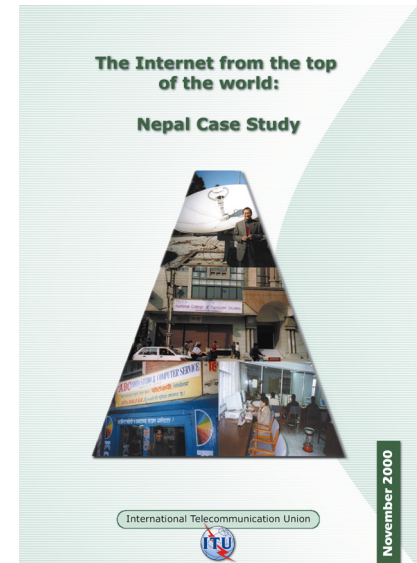# A review of the Mosaic methodology

Michael.Minges@itu.int

ITU Internet Case Studies

- 2 ½ years
  (since January 2000)
- 15 nations studied
- Purpose:
  - Try to overcome lack of reliable ICT data in developing nations
  - Seek reasons which retard or accelerate Internet development
- Using Mosaic methodology
  <mosaic.unomaha.edu/gdi.html>

The Internet from the top of the world:

Nepal Case Study

International Telecommunication Union

November 2000

Internet on the Mekong:

Lao PDR Case Study

March 2002

Mosaic framework

Category	Definition
Pervasiveness	Proportion of Internet users
Dispersion	Concentration of the Internet within a nation, from none or a single city to nationwide availability with points-of-presence or toll free access in all first-tier political subdivisions and common rural access
Sectoral absorption	Degree of Internet utilization in the education, commercial, health care, and public sectors
Connectivity infrastructure	Based on international and national backbone bandwidth, exchange points, and last-mile access methods
Organizational infrastructure	State of the ISP industry and market conditions
Sophistication of use	Measure characterizing usage from conventional to highly sophisticated and driving innovation

Five values (0 to 4) for each category with 4 being best.
Maximum total score of 24.

The scorecard

		Pervasiveness	Dispersion	Absorption	Connectivity	Organizational	Sophistication	Total	Date
1	Singapore	4.0	4.0	4.0	3.0	3.5	3.5	22.0	Jul-00
2	Korea	4.0	4.0	3.5	4.0	3.5	3.0	22.0	May-02
3	Malaysia	4.0	3.5	2.5	2.5	3.5	2.5	18.5	Apr-01
4	Indonesia	3.0	3.0	1.5	2.5	3.5	2.0	15.5	May-01
5	Thailand	3.0	3.5	2.5	2.5	2.0	2.0	15.5	Aug-01
6	Philippines	3.0	2.5	2.0	2.5	3.0	2.0	15.0	Sep-01
7	Hungary	3.0	2.0	2.0	2.5	2.0	2.0	13.5	Oct-00
8	Cape Verde	3.0	3.0	2.0	2.0	1.0	2.0	13.0	Apr-02
9	Egypt	2.5	2.5	1.5	1.5	2.5	2.0	12.5	May-00
10	Bolivia	2.0	3.0	1.0	2.0	2.0	1.5	11.5	May-00
11	Vietnam	2.0	2.0	1.5	1.5	2.0	1.5	10.5	May-01
12	Laos	2.0	1.5	1.0	1.5	2.0	1.0	9.0	Nov-01
13	Uganda	1.0	1.0	1.0	1.5	3.0	1.0	8.5	Feb-00
14	Nepal	1.0	1.0	1.0	1.0	3.0	1.0	8.0	Jan-00
15	Cambodia	1.0	1.5	1.0	1.5	1.5	1.0	7.5	Jul-01
	Average	**2.6**	**2.5**	**1.9**	**2.1**	**2.5**	**1.9**	**13.5**	

Mosaic attractions & drawbacks

Attractions

- Highlights where a country's relative strengths and weaknesses are

- Can be a sanity check for unreliable Internet user data

- Is a better overall measure of ICT potential than just Internet user penetration by including sector absorption

Drawbacks

- Base data not always available or unreliable

- Some items require subjective assessment

- Often maps back to Internet user or income

- Does not factor in universal access issues such as affordability or presence of Internet cafes

- Does not factor in 'soft' factors such as education or literacy

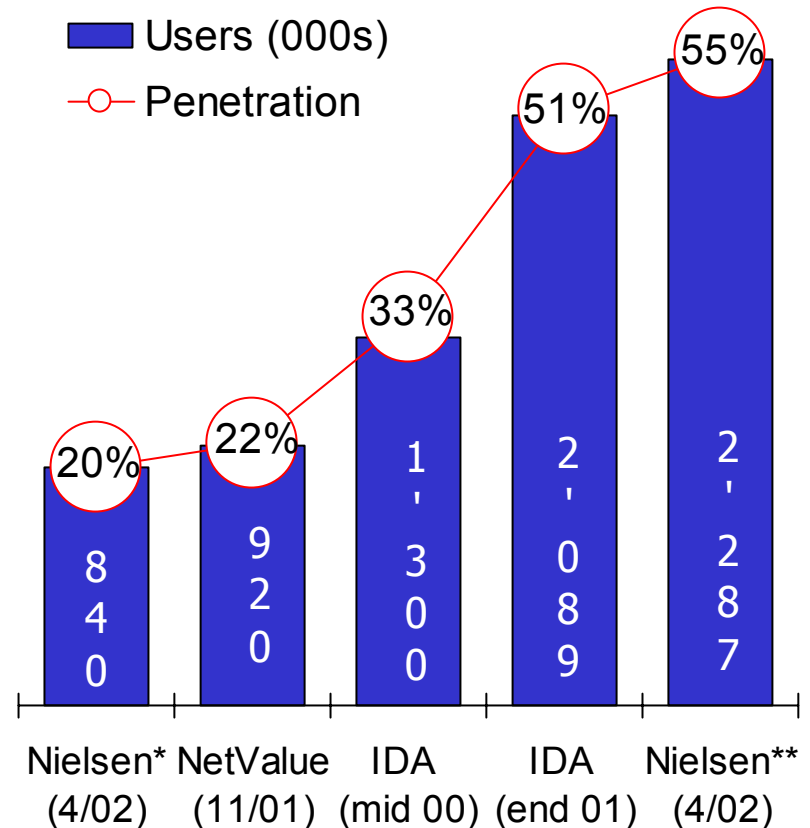# Quickly see relative strength and weakness
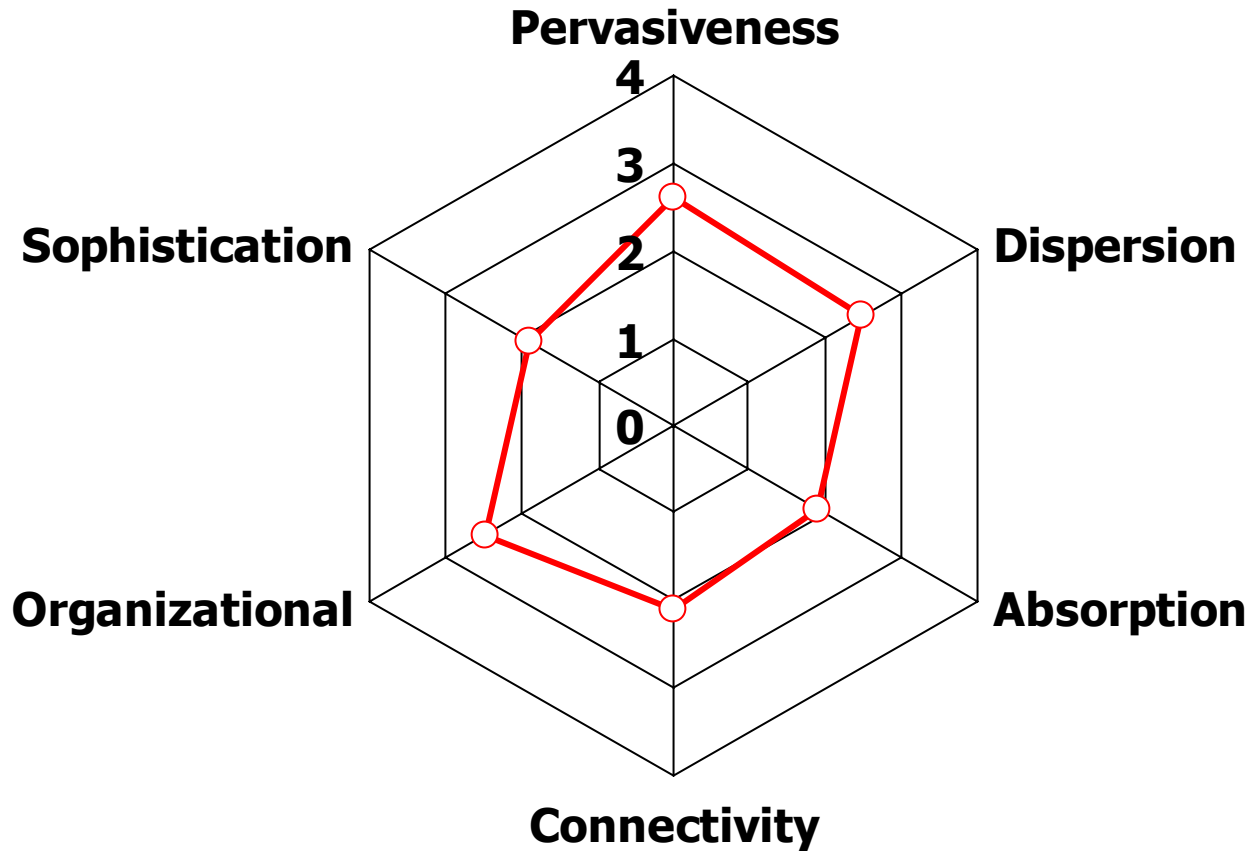
Pervasiveness & dispersion

- Reliable Internet user surveys lacking for many developing nations (and inconsistent ones for developed!!!)
- Not very granular
- Geographic dispersion hard to judge or not so relevant (e.g., 1st Tier political sub-divisions, nationwide Internet dial-up numbers versus POPs)

How many Internet users does Singapore have?

Users (000s)

Penetration

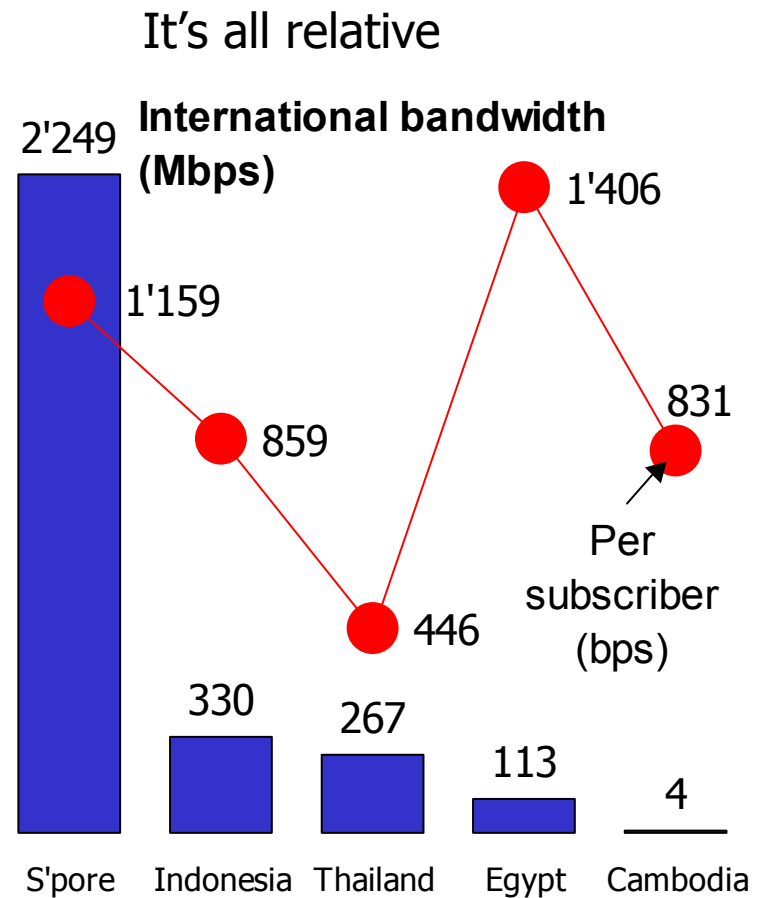| Nielsen* (4/02)	NetValue (11/01)	IDA (mid 00)	IDA (end 01)	Nielsen** (4/02)
20%	22%	33%	51%	55%
840	920	1,300	2,089	2,287

* Used in last month
** Universe

Absorption & connectivity

- Absorption:
  - What level of government or education should be considered? Should it be central/local government, primary/secondary/tertiary education?

- Connectivity:
  - Mixed values. Rep. Korea has world's highest broadband penetration yet its domestic & international connectivity would have low values according Mosaic
  - Related to size of nation: Absolute values not as important as relative ones

It's all relative

International bandwidth (Mbps)

Per subscriber (bps)

|	S'pore	Indonesia	Thailand	Egypt	Cambodia
Bar (bandwidth)	2'249	330	267	113	4
Point (per subscriber)	1'159	859	446	1'406	831

Organizational & sophistication

- Hard to measure: What is sophistication?

- Mixed values: Many ISPs but only one with international gateway

- Actual versus theoretical: Country may have 'open' market on paper but only one ISP in operation
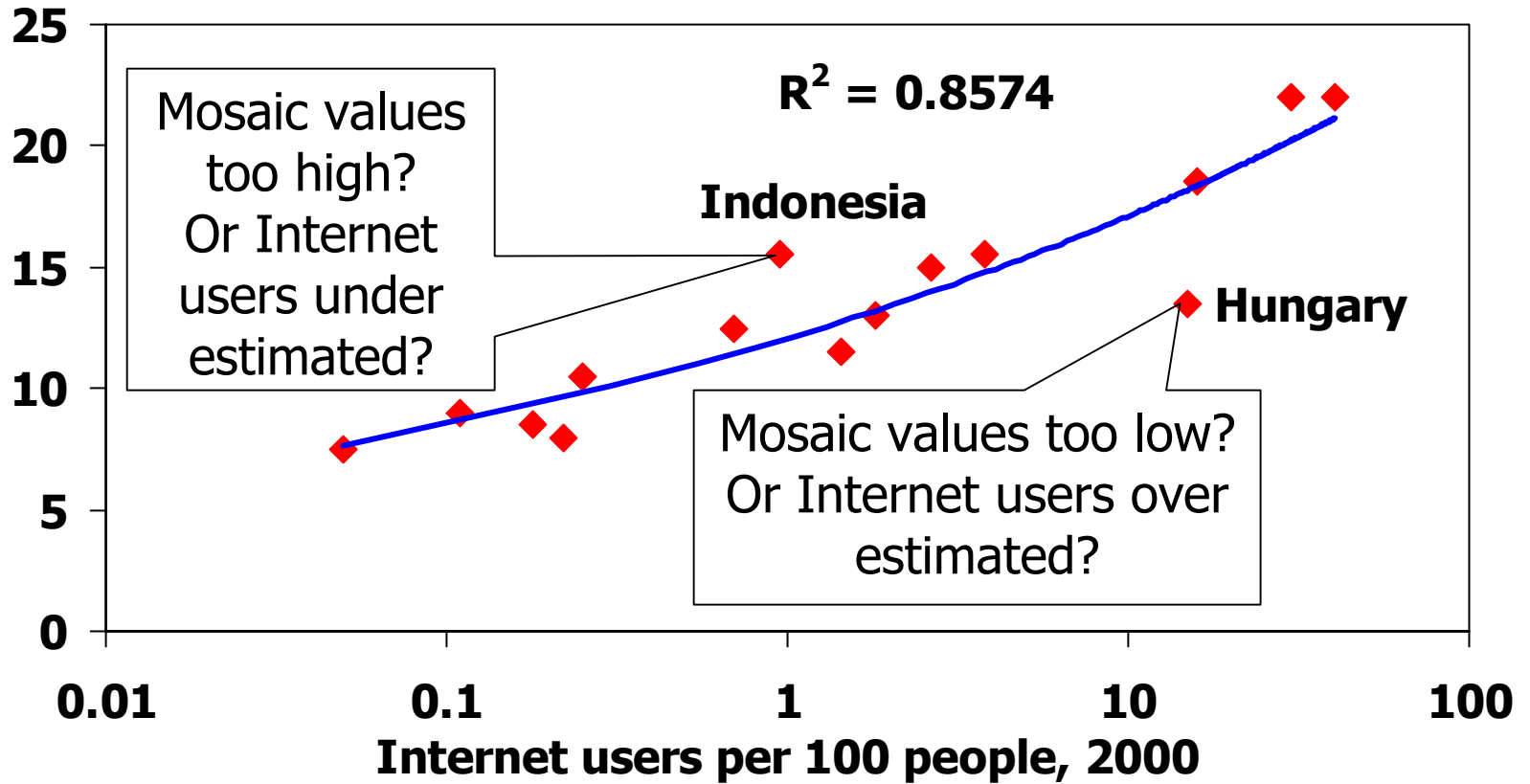
Mosaic compared to income
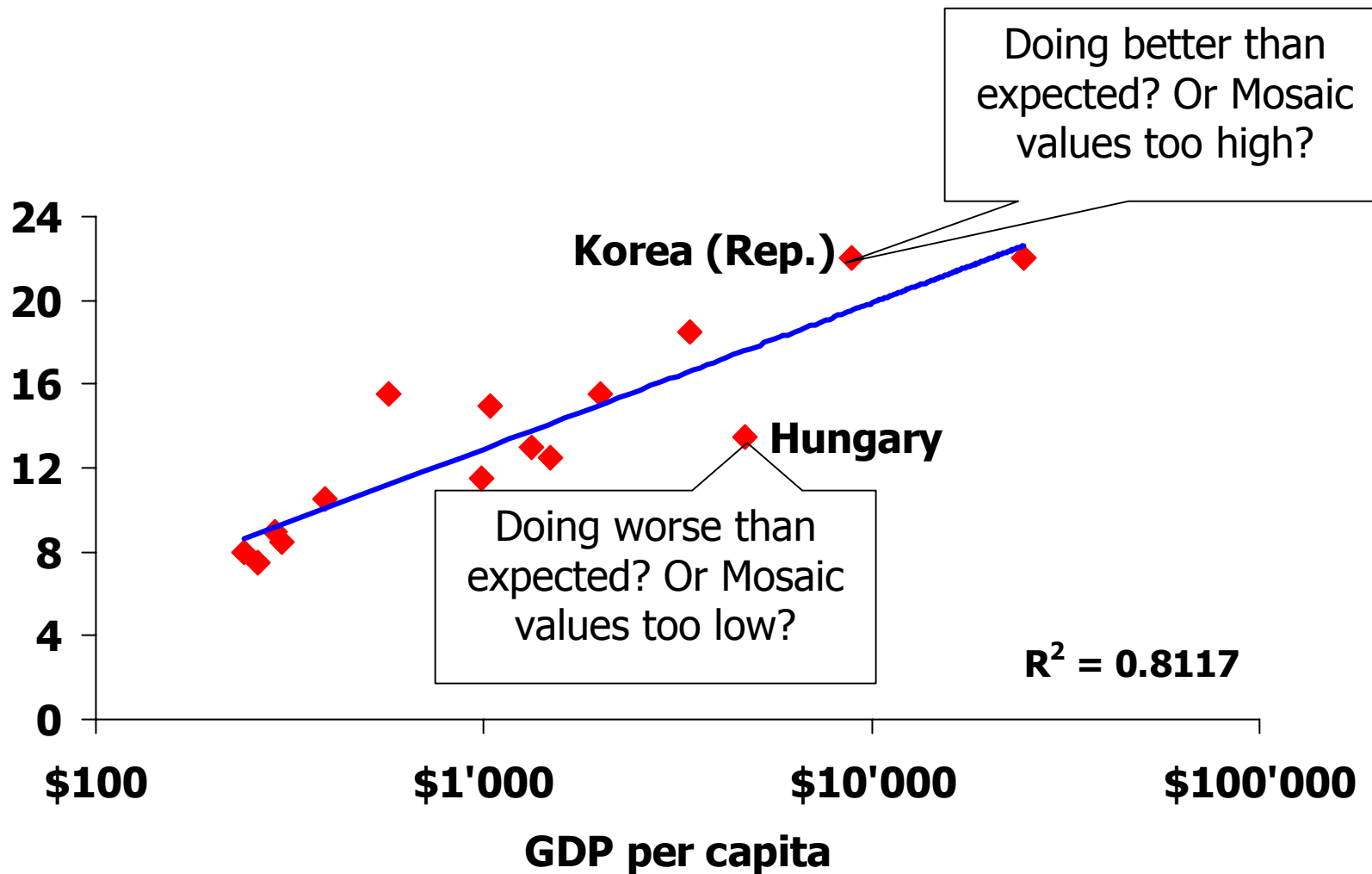
Mosaic & Internet penetration

An Internet Development Index

Concept	Indicator
Human	Literacy, Newspaper circulation
	Secondary+ education, tertiary enrolment
	Language
Affordability	Price of Internet access
Infrastructure	Fixed telephone lines per capita
	PCs per capita
	Internet subscribers per capita
	International bandwidth (per subscriber, BMI)
Connectivity	Schools, business, households