WORLD TELECOMMUNICATION INDICATORS MEETING

Geneva, March 19-21, 1996

WORKING DOCUMENTS

INTERNATIONAL TELECOMMUNICATION UNION

Working Documents

World Telecommunication Indicators Meeting, 1996

INTERNATIONAL TELECOMMUNICATION UNION, GENEVA DECEMBER 1996

World Telecommunication Indicators Meeting, 1996

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INTERNATIONAL TELECOMMUNICATION UNION

FOREWORD

The first World Telecommunication Indicators Meeting, organised under the auspices of the ITU's Telecommunication Development Bureau's (BDT) indicators programme, was held in Geneva from 19 to 21 March 1996. It was attended by 142 participants from 63 countries.

Participants included providers, collectors and users of telecommunication statistics including telecommunication ministries, regulators, and operators, national statistical offices, international organizations, consultants, financial institutions and researchers.

Twenty-five speakers made presentations covering various subjects including tariffs, traffic, regional indicator collection, benchmarking, electronic dissemination, national statistical agency work and convergence.

This report includes proceedings of the meeting, list of participants, speakers' presentations as well as a summary of the survey on ITU/BDT indicators.

The meeting highlighted the importance of telecommunications indicators by demostrating the areas in which statistics can be applied. Furthermore, the meeting succeeded in raising the level of awareness of policy makers, regulators, operators and others about the importance of the statistics. A spirit of cooperation was demonstrated among all which is necessary to overcome the existing limitations on the availability of telecommunications indicators. As collaboration grows, the availability of telecommunication indicators will improve, enhancing understanding of one of the world's most dynamic and important industries.

The meeting recognised that the availability of timely and meaningful telecommunications statistics is becoming more and more important. There has been on-going restructuring of the telecommunication industry in a growing number of countries since the early 1980s. There is a vital need for indicators to analyze the changes in order to inform countries about the impact of various policy options.

The participants manifested the desire and the need for more frequent indicator meetings and for additional discussion time in future meetings.

The discussions raised during the meeting provide a set of guidelines for the ITU Telecommunication Development Bureau to work in this context.

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INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

Document WTIM96/1-E
21 March, 1996
Original: English

WORLD TELECOMMUNICATION INDICATORS MEETING:
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World Telecommunication Indicators Meeting

Final list of documents

Doc. No.	Source	Title	Language
1	ITU, Switzerland	Provisional list of document	E/F/S/R
2	ITU, Switzerland	List of announced participants	E/F/S
3	ITU, Switzerland	Agenda	E/F/S/R
4	ITU, Switzerland	Note from the coordinator	E/F/S/R
5	ITU, Switzerland	World Telecommunication Indicators database on ☆STARS☆ (diskette)	E
6	Mr. M. Minges, ITU/BDT	The state of telecom statistics world-wide	E/F/S/R
7	ITU, Switzerland	Survey on ITU/BDT Indicators	E/F/S/R
8	Mr. T. Kelly, ITU/SPU	Performance indicators for PTOs: An update	E/F/S/R
9	Mr. P. Laidler, CSMG (UK)	International Traffic Modelling	E/F/S
10	Mr. M. Duckworth, OFTEL (UK)	Telecommunication Market Report	E/F/S/R
11	Mr. R.Worthington, Pomona College	A performance assessment framework for the global telecommunications industry	E/F/S
12	Mr. F.D. Gault, Statistics Canada	Industrial classification and data collection	E/F/S/R
13	Mr. E. Reik, EITO	What is the European Information Technology Observatory - EITO	E/F/S/R
14	Mr. G. Staple, Telegeography	The new demand for telecoms traffic data: from MiTTS to maps	E/F/S
15	Mr. J. Houghton, BIE	Country policy use of telecommunications performance indicators in Australia	E
16	Mr. Yuji Kato, OECD	Telecommunication Pricing Indicators by the OECD	E
17	Mr. R. Martínez I., SCT (Mexico)	Quarterly Telecommunication Report: a strategic approach to foster competition through transparency	E
18	Mr. G. Zongo, ATO (Senegal)	Essai d’analyse des causes de faiblesse de la télédensité et de la productivité du secteur africain des télécommunications	E/F
19	Mr Geoffroy & Verlynde, OMSYC	Convergence between telecommunication and audiovisual industries and markets: deregulation and double counting	E
20	Mr. T. Kelly, ITU/SPU	Using tariff comparison models for international telephone services	E

Doc. No.	Source	Title	Language
21	Mr. V. Sivoraksha, RCC (Russia)	Regional statistics	E/F/S/R
22	Mr. E. Reik, EITO	What is the EITO ? (text)	E
23	Mr. O. Gardin, EUROSTAT	European Telecommunication Statistics	E
24	Mr. Sam Paltridge, OECD	Telecommunication Quality of Service Statistics	E
25	OECD	Communication Outlook 1995, chapter 6	E/F
26	Mr.A. Dickson, BT	Tariff comparisons and monitoring	E
27	Mr. C. Pereira de A., TELEBRAS	Customer Satisfaction measurement	E
28	Mr. R. Shaw, ITU	Disseminating Information via the Internet	E
29	ITU, Switzerland	Global Telecoms Database	E
30	RCC, Russia	Statistical Report	E
31	Mrs. M. Okumura, MPT, Japan	Global Inventory and International Telecommunications Inventory	E

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Survey on ITU/BDT Indicators

World Telecommunication Indicators Meeting, 1996

INTERNATIONAL TELECOMMUNICATION UNION

SURVEY ON ITU/BDT INDICATORS

In order to help guide the ITU Telecommunication Development Bureau's (BDT) indicator programme, a questionnaire was circulated to the participants. It solicited comments about the following subjects:

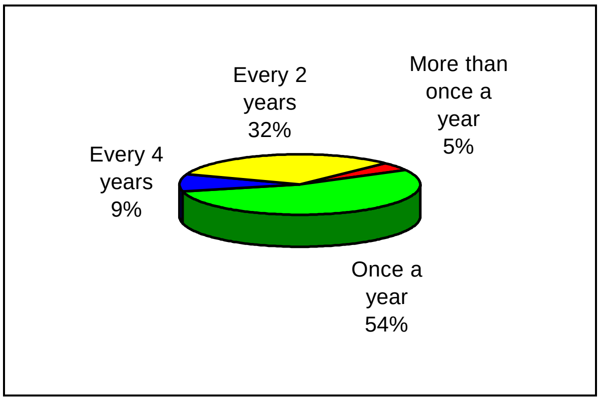
- *indicator meetings*
- *ITU indicator publications*
- *the list of indicators used by the ITU*

Almost 50% of participants responded to the questionnaire. The results are summarized below.

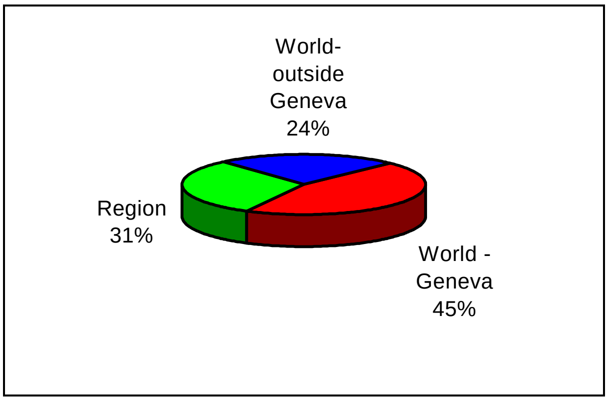
Indicator meetings

The level of participation for the first World Telecommunication Indicator Meeting suggests that there is a considerable interest for indicators. In particular, the participants expressed the desire for continued indicator meetings (54% of the reponses indicated that the frequency of indicator meetings should be once a year). Also 45% expressed preference to hold world meetings in Geneva, as opposed to regional and world meetings elsewhere.

What should the frequency of indicator meeting be?



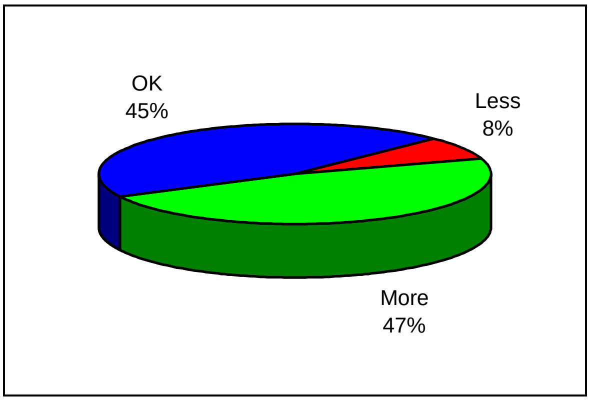
Format of the meeting (a world meeting or regional meetings):



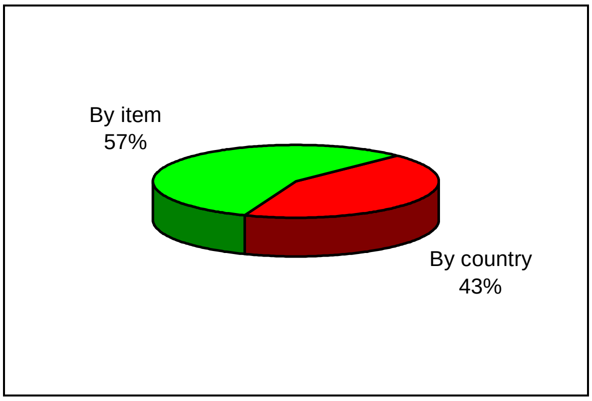
BDT Indicator Reports

The BDT regularly publishes indicator reports such as the World Telecommunication Development Report, regional indicator and topical reports (e.g., Direction of Traffic covering international telephone traffic). An analysis of the questionnaires confirmed the demand for a deeper analysis of the statistics to be included in the reports (47%). Also 45% are satisfied with the extent of analysis already present. In comparison, there was no significant preference between topical and regional reports.
A majority of participants expressed a desire for indicators to be collected by both operator and by country.
The ITU also publishes a Yearbook of Statistics showing telecommunication data for the previous ten years. The responses to the questionnaire did not indicate a preferred method to present indicators: 57% preferred the presentation of telecommunication statistics by topic against the 43% which preferred by country.

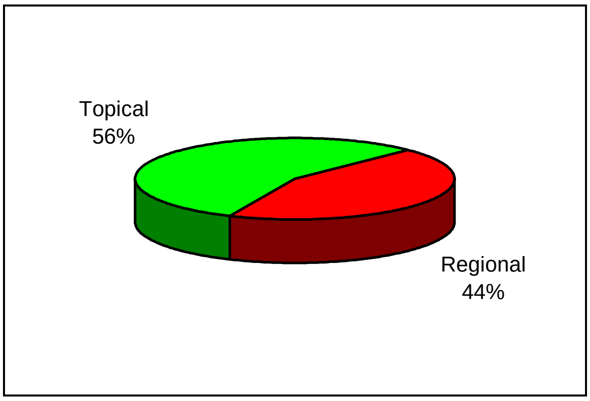
Level of analysis in BDT Indicator Reports



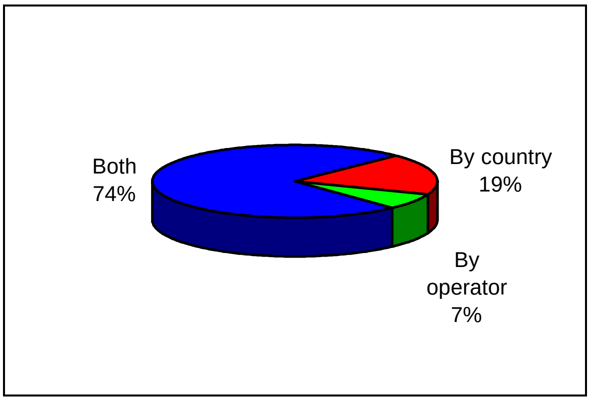
ITU Statistical Yearbook should show indicators by topic or by country (country pages):



Regional (covering all telecommunication areas for one region in detail) or topical (covering one subject such as telephone traffic) reports:



Prefer indicators by country or by operator or both:



The list of indicators used by the ITU

The ITU/BDT actively collects, compiles and disseminates a core set of telecommunication indicators. The meeting's participants were asked to rank the importance of the indicators used by the ITU. In terms of the statistics regularly published in BDT reports, traditional indicators such as international telephone traffic, main lines and revenue were ranked high. National traffic and cellular subscribers were also considered high priority. At the opposite end of the scale, indicators covering older services such as telex subscribers and telex and telegram traffic were considered low priority.

Other indicators not regularly published by the ITU and considered important include the percentage of international direct dialled calls and mobile traffic and tariffs. Low prority indicators included teletex, videotex and bureaufax.

Non-telecom indicators considered important include population, GDP and Internet hosts while radio broadcasting indicators were ranked low priority.

4a. List of indicators

Ranked by priority		Replies	Priority Low	Medium	High
i132m	International outgoing telephone traffic	42	2%	5%	93%
i112	Main telephone lines in operation	42	0%	10%	90%
i75	Total revenue from all telecom services	42	0%	14%	86%
i1312m	National trunk telephone traffic (minutes)	41	0%	15%	85%
i71	Total income from telephone service	42	2%	14%	83%
i271	Cellular mobile telephone subscribers	42	5%	17%	79%
i1311m	Local telephone traffic (minutes)	42	2%	19%	79%
i76	Total expense for telecom services	41	5%	17%	78%
i152	Monthly subscription for telephone service	42	7%	17%	76%
i412	Private leased circuits	42	7%	19%	74%
i151	Connection fee for telephone service	42	10%	17%	74%
i7133	Income from international calls	42	0%	26%	74%
i713	Income from telephone calls	41	0%	27%	73%
i741	Mobile communication revenue	42	5%	24%	71%
i51	Full-time telecommunication staff	42	10%	21%	69%
i141	% of telephone faults cleared by next working day	41	10%	22%	68%
i28	Total number of ISDN subscribers	40	8%	25%	68%
i761	Operational expenditure	42	7%	26%	67%
i1142	Percent of main lines connected to digital exchanges	41	5%	29%	66%
i413	Total subscribers to public data networks	40	5%	30%	65%
i142	% of unsuccessful calls - local network	40	5%	33%	63%
i732	Leased circuit revenue	42	5%	33%	62%
i82	Annual investment (not incl. land & buildings)	42	2%	36%	62%
i1431	Total number of main line faults for year	41	5%	34%	61%
i712	Income from telephone subscription charges	42	7%	33%	60%
i81	Annual investment in telecom (incl. land & buildings)	42	2%	38%	60%
i116	% of residential main lines	41	2%	39%	59%
i84	Annual investment in switching equipment	41	0%	41%	59%
i1112	Public pay phones	42	14%	29%	57%
i711	Income from telephone connection charges	42	7%	36%	57%
i145	Number of complaints per 1000 customer bills	41	5%	39%	56%
i762	Depreciation	42	12%	33%	55%
i117	Total line capacity of local exchanges	41	7%	39%	54%
i763	Net interest paid / received	42	7%	40%	52%
i1162	% of main lines in urban areas	41	7%	41%	51%
i275	Radio paging subscribers	41	12%	37%	51%
i123	Waiting list for main lines	42	19%	31%	50%
i764	Income tax	42	14%	38%	48%
i144	% of operator assistance calls answered in 15 seconds	39	10%	46%	44%
i731	Income from data transmission	42	5%	55%	40%
i765	Other expenditure	42	14%	45%	40%
i74	Other income (facsimile, videotex, etc.)	42	19%	45%	36%
i262	Videotex subscribers	40	33%	38%	30%
i73	Income from telex service	42	48%	31%	21%
i72	Income from public telegram service	42	50%	31%	19%
i322m	International outgoing telex traffic (minutes)	42	45%	38%	17%
i21	Number of national paid telegrams (messages)	42	62%	24%	14%
i22	International outgoing telegrams (messages)	42	57%	29%	14%
i321m	National telex traffic (minutes)	42	60%	31%	10%
i311	Telex subscribers	40	58%	35%	8%

4b. Other telecommunication statistics			**Priority**		
Ranked by priority		**Replies**	**Low**	**Medium**	**High**
i134m	International direct dialled calls (minutes)	43	2%	16%	81%
i134	% of international direct dialled calls	43	2%	21%	77%
i131mw	Total national mobile outgoing traffic (minutes)	43	2%	23%	74%
i83	Annual investment for telephone service	42	2%	31%	67%
i1423	% of unsuccessful calls due to technical faults & other	43	2%	33%	65%
i151d	Digital cellular connection charge	43	7%	28%	65%
i152d	Digital cellular monthly subscription	43	7%	28%	65%
i131mc	Total national mobile outgoing traffic (calls)	43	2%	35%	63%
i153d	Digital cellular - cost of local 3 minute call	43	7%	33%	60%
i122	Total demand for main lines (including transfer)	41	5%	37%	59%
i1111	Percentage of households with a telephone	43	2%	40%	58%
i151c	Analog cellular connection charge	43	7%	35%	58%
i1191	International telephone circuits	42	5%	38%	57%
i121	New applications for main lines	41	7%	37%	56%
i152c	Analog cellular monthly subscription	43	7%	37%	56%
i85	Total fixed assets	42	2%	43%	55%
i71331	Outpayments to administrations	42	10%	38%	52%
i71332	Inpayments from administrations	42	10%	38%	52%
i84	Annual investment in switching equipment	42	7%	40%	52%
i153c	Analog cellular - cost of local 3 minute call	43	9%	40%	51%
i1110	Number of local public switching exchanges	42	14%	36%	50%
i274	Personal Communication Service (PCS) subscribers	38	11%	39%	50%
i7611	Wages, salaries and other personnel expenses	42	7%	43%	50%
i842	Annual investment in transmission equipment	42	10%	40%	50%
i850	Total assets	42	5%	45%	50%
i1181	Total km of fibre optic cable in network	43	16%	35%	49%
i1186	% of fiber optic cable in national transmission network	41	15%	37%	49%
i115	% of main lines equip. for direct int'l dialling	42	14%	38%	48%
i7613	Research and development expenses	42	10%	43%	48%
i841	Annual investment in external plant	42	10%	43%	48%
i851	Other assets	40	8%	45%	48%
i86	Total liabilities and equity	40	8%	45%	48%
i1421	% of unsuccessful calls due to called number busy	43	19%	35%	47%
i153co	Analog cellular - cost of local 3 minute call (off-peak)	43	7%	47%	47%
i4132	Packet switched network subscribers	41	10%	44%	46%
i114	Percent of main lines connected to automatic exchanges	41	7%	49%	44%
i1185	Km of fiber optic cable in national transmission network	41	15%	41%	44%
i265	Number of Freephone subscribers	41	20%	37%	44%
i291	Number of VSAT subscribers	40	15%	43%	43%
i276	Non-cellular mobile subscribers	38	18%	39%	42%
i1422	% of unsuccessful calls due to no answer	43	26%	33%	42%
i2811	Int'l earth stations	41	17%	41%	41%
i4131	Circuit-switch network subscribers	41	15%	44%	41%
i1187	Km of fibre optic cable in local network	42	14%	45%	40%
i1144	% of main lines equipped for ISDN	40	8%	53%	40%
i264	Number of mailboxes MHS F.400 / X.400	40	15%	45%	40%
i1143	% of main lines equipped for SS7	38	16%	45%	39%
i273	CT2 (telepoint) subscribers	38	21%	39%	39%
i861	Equity	41	5%	56%	39%
i119	Trunk telephone circuits	42	5%	57%	38%
i862	Long-term debt	40	5%	58%	38%
i1121	Main lines in largest city	41	15%	51%	34%
i4133	Data modems in operation	41	27%	39%	34%
i272	Trunked mobile subscribers	36	25%	42%	33%
i863	Other liabilities	41	10%	61%	29%
i111	Telephone stations (sets)	43	30%	42%	28%
i251	Bureaufax stations	42	43%	31%	26%
i292	Number of teleports	39	26%	49%	26%
i7612	Non-income taxes	42	17%	60%	24%
i113	Main lines connected to PBX	43	5%	72%	23%
i2512	National Bureaufax traffic (paid pages)	41	41%	37%	22%
i2513	Outgoing international Bureaufax traffic (pages)	41	41%	41%	17%
i261	Teletex subscribers	40	60%	28%	13%
i263	Videotex information providers	41	44%	44%	12%
i1131	Number of private branch exchanges (PBX)	43	12%	77%	12%

4c. Derived indicators

Ranked by priority		Replies	Priority: Low	Medium	High
i91	Main telephone lines per 100 inhabitants	42	2%	10%	88%
i93	Telecommunication investment as a % of GDP	41	2%	22%	76%
i96	Telecom investment as a % of revenues	42	10%	17%	74%
i95	Telecommunication revenues as a % of GDP	42	5%	24%	71%
i971	Main telephone lines per employee	42	14%	19%	67%
i951	Telecommunication revenues per main line (US$)	42	5%	31%	64%
i97	Telecommunication staff per 1'000 main lines	42	12%	26%	62%
i952	Telecommunication revenues per employee (US$)	42	12%	26%	62%
i94	Telecommunication investment as a % of GFCF	42	10%	38%	52%
i9511	Operating cash flow per main line (US$)	42	5%	48%	48%
i92	Telephone sets per 100 inhabitants	42	26%	45%	29%

4d. Non-telecom indicators

Ranked by priority		Replies	Priority Low	Medium	High
i61	Population	41	2%	15%	83%
i63	Gross domestic product (GDP)	41	0%	17%	83%
i421	Internet networks	38	10%	17%	66%
i4211	Internet host computers	38	7%	20%	66%
i62	Households	41	0%	29%	71%
i66	Consumer price index (1987=100)	41	5%	25%	73%
i652	Average annual exchange rate per US$	40	8%	26%	69%
i422	Number of personal computers	40	13%	20%	68%
i65	National currency per US$ (end of year)	39	7%	29%	59%
i6721	Imports of telecommunication equipment (US$)	41	5%	39%	56%
i965c	Cable TV subscribers	41	17%	27%	56%
i6111	Urban population percent	41	2%	44%	54%
i64	Gross Fixed Capital Formation (GFCF)	40	8%	40%	53%
i965h	Households passed by cable television	41	18%	35%	50%
i422s	Personal computer shipments	39	24%	24%	46%
i6711	Exports of telecommunication equipment (US$)	41	15%	41%	49%
i966	Percent of population covered by TV broadcasting	42	24%	34%	44%
i612	Population of largest city	41	17%	41%	41%
i965s	Home satellite antennas	42	13%	53%	45%
i965	Television receivers	41	21%	40%	36%
i956	Percent of population covered by radio broadcasting	40	31%	33%	31%
i9651	Television receivers per 100 inhabitants	39	24%	47%	32%
i965L	Television licences / households	38	26%	50%	24%
i955L	Radio receivers (licenses)	40	33%	55%	13%
i955	Radio receivers	41	31%	62%	13%

Survey on ITU/BDT Indicators

1. BDT Indicator Reports

The BDT regularly publishes indicator reports such as the *World Telecommunication Development Report*, regional indicator reports and topical reports (e.g., *Direction of Traffic* covering international telephone traffic). There has been a trend to more analysis of the statistics in the reports.

a). Would your prefer:

❑ Less analysis ❑ More analysis ❑ OK as is

b). Do you prefer:

❑ Regional reports ❑ Topical reports

c). How might the reports be improved:

____

____

(use a separate page if needed)

2. Telecommunication Indicators for Public Telecommunication Operators

The majority of the ITU/BDT telecommunication indicator publications are maintained at a country level.

a). Would you also like to see indicators maintained by operator?

❑ Prefer indicators by country ❑ Prefer indicators by operator ❑ Both

3. Yearbook of Statistics

The ITU publishes a yearbook of telecommunication statistics showing data for the last ten years.

a). Do you prefer that the Yearbook show the statistics by item or by country (Note that the World Telecommunication Development Report already shows statistics by item including regional and world totals):

❑ Statistics by item (see Attachment 1) ❑ Statistics by country (see Attachment 2)

b). Do you have any comments on the Yearbook might be improved?

____

____

____

(use a separate page if needed)

Name / Organization / Country of person completing the survey:

Survey on ITU/BDT Indicators

4a. List of indicators

The ITU/BDT actively collects, compiles and disseminates a **core set of telecommunication indicators**. Could you please rank the importance of these indicators:

			PRIORITY		
		TELEPHONE NETWORK	**Low**	**Medium**	**High**
1	i112	Main telephone lines in operation			
2	i117	Total line capacity of local exchanges			
3	i1142	Percent of main lines connected to digital exchanges			
4	i116	% of residential main lines			
5	i1162	% of main lines in urban areas			
6	i1112	Public pay phones			
		OTHER SERVICES			
7	i311	Telex subscribers			
8	i271	Cellular mobile telephone subscribers			
9	i275	Radio paging subscribers			
10	i412	Private leased circuits			
11	i413	Total subscribers to public data networks			
12	i262	Videotex subscribers			
13	i28	Total number of ISDN subscribers			
14	i123	Waiting list for main lines			
		QUALITY OF SERVICE			
15	i141	% of telephone faults cleared by next working day			
16	i142	% of unsuccessful calls - local network			
17	i1431	Total number of main line faults for year			
18	i144	% of operator assistance calls answered in 15 seconds			
19	i145	Number of complaints per 1000 customer bills			
		TRAFFIC			
21	i1311m	Local telephone traffic (minutes)			
22	i1312m	National trunk telephone traffic (minutes)			
23	i132m	International outgoing telephone traffic (minutes)			
24	i21	Number of national paid telegrams (messages)			
25	i22	International outgoing telegrams (messages)			
26	i321m	National telex traffic (minutes)			
27	i322m	International outgoing telex traffic (minutes)			
		TARIFFS			
28	i151	Connection fee for residential telephone service			
29	i152	Monthly subscription for residential telephone service			
		STAFF			
35	i51	Full-time telecommunication staff			
		REVENUE, EXPENSE, INVESTMENT			
36	i75	Total revenue from all telecom services			
37	i71	Total income from telephone service			
37.1	i711	Income from telephone connection charges			
37.2	i712	Income from telephone subscription charges			
37.3	i713	Income from telephone calls			
37.4	i7133	Income from international calls			
38.1	i72	Income from public telegram service			
38.2	i73	Income from telex service			
39	i731	Income from data transmission			
40	i732	Leased circuit revenue			
41	i741	Mobile communication revenue			
42	i74	Other income (facsimile, videotex, etc.)			
43	i76	Total expense for telecom services			
44	i761	Operational expenditure			
45	i763	Net interest paid / received			
46	i764	Income tax			
47	i762	Depreciation			
48	i765	Other expenditure			
49	i81	Annual investment in telecom (incl. land & buildings)			
50	i82	Annual investment (not incl. land & buildings)			
50.1	i84	Annual investment in switching equipment			

Name / Organization / Country of person completing the survey:

Survey on ITU/BDT Indicators

4b. Other telecommunication statistics

The ITU/BDT also collects **other telecommunication statistics**. Could you rank the importance of these statistics and add any other telecommunication indicators that are not shown that should also be collected and their definition.

		PRIORITY		
	OTHER INDICATORS	**1= low**	**2 = medium**	**3=high**
	INFRASTRUCTURE			
i111	Telephone stations (sets)			
i1110	Number of local public switching exchanges			
i1111	Percentage of households with a telephone			
i1121	Main lines in largest city			
i113	Main lines connected to PBX			
i1131	Number of private branch exchanges (PBX)			
i114	Percent of main lines connected to automatic exchanges			
i1143	% of main lines equipped for SS7			
i1144	% of main lines equipped for ISDN			
i115	% of main lines equip. for direct international dialling			
i1181	Total km of fibre optic cable in network			
i1185	Km of fibre optic cable in national transmission network			
i1186	% of fibre optic cable in national transmission network			
i1187	Km of fibre optic cable in local network			
i119	Trunk telephone circuits			
i1191	International telephone circuits			
i121	New applications for main lines			
i122	Total demand for main lines (including transfer)			
	TRAFFIC			
i131mc	Total national mobile outgoing traffic (calls)			
i131mw	Total national mobile outgoing traffic (minutes)			
i134	% of international direct dialled calls			
i134m	International direct dialled calls (minutes)			
	QUALITY OF SERVICE			
i1421	% of unsuccessful calls due to called number busy			
i1422	% of unsuccessful calls due to no answer			
i1423	% of unsuccessful calls due to technical faults & other			
	TARIFFS			
i151c	Analogue cellular connection charge			
i151d	Digital cellular connection charge			
i152c	Analogue cellular monthly subscription			
i152d	Digital cellular monthly subscription			
i153c	Analogue cellular - cost of local 3 minute call			
i153co	Analogue cellular - cost of local 3 minute call (off-peak)			
i153d	Digital cellular - cost of local 3 minute call			
	OTHER SERVICES			
i251	Bureaufax stations			
i2512	National Bureaufax traffic (paid pages)			
i2513	Outgoing international Bureaufax traffic (pages)			
i261	Teletex subscribers			
i263	Videotex information providers			
i264	Number of mailboxes MHS F.400 / X.400			
i265	Number of Freephone subscribers			
i272	Trunked mobile subscribers			
i273	CT2 (telepoint) subscribers			
i274	Personal Communication Service (PCS) subscribers			
i276	Non-cellular mobile subscribers			
i2811	Int'l earth stations			
i291	Number of VSAT subscribers			
i292	Number of teleports			
i4131	Circuit-switch network subscribers			
i4132	Packet switched network subscribers			
i4133	Data modems in operation			

Name / Organization / Country of person completing the survey:

Survey on ITU/BDT Indicators

4b. Other telecommunication Indicators (continued)

		PRIORITY		
	FINANCIAL	**1= low**	**2 = medium**	**3=high**
i71331	Outpayments to administrations			
i71332	Inpayments from administrations			
i7611	Wages, salaries and other personnel expenses			
i7612	Non-income taxes			
i7613	Research and development expenses			
i83	Annual investment for telephone service			
i84	Annual investment in switching equipment			
i841	Annual investment in external plant			
i842	Annual investment in transmission equipment			
i85	Total fixed assets			
i850	Total assets			
i851	Other assets			
i86	Total liabilities and equity			
i861	Equity			
i862	Long-term debt			
i863	Other liabilities			

	Please add any other indicators you feel are important below (including the definition)	**Definition**

Name / Organization / Country of person completing the survey:

Survey on ITU/BDT Indicators

4c. Derived indicators

The ITU/BDT also regularly calculates a set of **derived indicators** to enhance comparisons.
Could you rank the importance of these indicators and add any other derived indicators and the formula for calculating them:

		PRIORITY		
	DERIVED INDICATORS	**1= low**	**2 = medium**	**3=high**
i91	Main telephone lines per 100 inhabitants			
i92	Telephone sets per 100 inhabitants			
i93	Telecommunication investment as a % of GDP			
i94	Telecommunication investment as a % of GFCF			
i95	Telecommunication revenues as a % of GDP			
i951	Telecommunication revenues per main line (US$)			
i9511	Operating cash flow per main line (US$)			
i97	Telecommunication staff per 1'000 main lines			
i971	Main telephone lines per employee			
i952	Telecommunication revenues per employee (US$)			
i96	Telecom investment as a % of revenues			

*	**Add any other derived indicators and the formula for calculating them:**	**Formula**

Name / Organization / Country of person completing the survey:

4d. Demographic, economic, broadcasting and information technology indicators

The ITU/BDT also collects **broadcasting, information technology, demographic and macroeconomic indicators**.

Could you rank the importance of these statistics and add any others and the definition.

		PRIORITY		
	DEMOGRAPHY, ECONOMY	**1= low**	**2 = medium**	**3=high**
i61	Population			
i6111	Urban population percent			
i612	Population of largest city			
i62	Households			
i63	Gross domestic product (GDP)			
i64	Gross Fixed Capital Formation (GFCF)			
i65	National currency per US$ (end of year)			
i652	Average annual exchange rate per US$			
i66	Consumer price index (1987=100)			
i6711	Exports of telecommunication equipment (US$)			
i6721	Imports of telecommunication equipment (US$)			
	BROADCASTING			
i955	Radio receivers			
i955L	Radio receivers (licenses)			
i956	Percent of population covered by radio broadcasting			
i965	Television receivers			
i9651	Television receivers per 100 inhabitants			
i965c	Cable TV subscribers			
i965h	Households passed by cable television			
i965L	Television licences / households			
i965s	Home satellite antennas			
i966	Percent of population covered by TV broadcasting			
	INFORMATION TECHNOLOGY			
i421	Internet networks			
i4211	Internet host computers			
i422	Number of personal computers			
i422s	Personal computer shipments			

	Add any other indicators of this nature and their definition:	**Definition**

Name / Organization / Country of person completing the survey:

5. World Telecommunication Indicators Meeting

This is the first time this kind of meeting has been held.

a) Do you think it should be held again?

❑ Yes ❑ No

b) If yes, what should be the frequency:

❑ More than annually ❑ Annually ❑ Every 2 years ❑ Every 4 years

c) Should the format be:

❑ As is (presentations with less discussion)
❑ Equally divided between presentation/discussion
❑ Discussion only
❑ Other (Please specify)

d) Shoud the meeting be global or regional and / or held only in Geneva and/or other places:

❑ World meeting in Geneva (like now)
❑ Regional meetings held in the region (e.g., Europe, Americas, etc.)
❑ World meeting but held outside Geneva

e) Any other comments about the meeting (subjects you liked / did not like / proposals for future meetings)

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(use a separate page if needed)

☺ **Thank you very much for your cooperation in completing this survey!**

Name / Organization / Country of person completing the survey:

Speakers' Presentations

World Telecommunication Indicators Meeting, 1996

INTERNATIONAL TELECOMMUNICATION UNION

Opening

Ahmed Laouyane, Director, Telecommunication Development Bureau (BDT), International Telecommunication Union, ITU

Session 1: Overview

A review of the state of telecom statistics world-wide including comparability, definitions, the effect of liberalization on data availability, collaboration with national statistics offices, and the effect of convergence and liberalization.

"The state of telecom statistics world-wide"
Michael Minges, Head, Information Systems Unit, ITU/BDT

"Performance indicators for PTOs: An update"
Tim Kelly, Head, Operational Analysis, ITU/SPU

Tuesday
19 March

OPENING REMARKS

It is with great pleasure that I welcome you to the first World Telecommunication Indicators meeting. This reunion arises from resolutions of different regional telecommunication development conferences—endorsed by the 1994 World Telecommunication Development Conference—to convene a global meeting dealing with the main indicators used to analyze worldwide telecommunication developments.

We are all aware of the growing importance of telecommunications and the need for relevant, up-to-date and comparable statistics for analyzing the industry. This includes measurements for comparing network progress and performance as well as macro-economic measurements to gauge the impact of telecommunications on social and economic development.

There is also an urgent need to gauge the benefits and costs of liberalization, privatization, competition and globalization taking place in the sector in order to inform policy makers and others about the effects of the growing number of options. Ironically, these same trends are complicating the availability and comparability of the statistics. This meeting might want to consider how to improve the coverage of the statistics in an era of growing liberalization.

Convergence is blurring the boundaries of the telecommunications, broadcasting and computing industries, making it difficult to determine exactly what it is to be measured. Perhaps telecommunication indicators should be expanded to cover information-communication indicators. Here too, this meeting might want to provide some guidelines.

The ITU's involvement with telecommunication statistics goes back a long way. The exchange of statistics goes back through the ITU's preceding organizations to the beginning of international telegraph networks in 1848. The ITU's mandate for disseminating telecommunication information is outlined in the International Telecommunication Convention as well as the ITU's agreement with the United Nations. However it is really since the establishment of the Telecommunication Development Bureau (BDT) that the ITU has begun to regularly use statistics in an analytical way in order to gauge network developments worldwide.

The BDT is intimately involved in telecommunication indicators. It launched the telecommunication indicator series in 1990. These publications, including the World Telecommunication Development Report, as well as regional and topical studies, have become the global source for comparable telecommunication indicators. The BDT also works closely with national, regional and international organizations on the definition, exchange and collaboration of telecommunication indicators. Indeed the BDT has collaborated on several of the indicator projects to be presented over the next few days at this meeting. The BDT has also organized regional telecommunication indicator meetings which serve as the foundation for this global encounter. Finally, the BDT has initiated several projects for assisting developing countries to improve the collection, dissemination and presentation of telecommunication indicators.

I wish you utmost success in this first World Telecommunication Indicators meeting. Furthermore, I can assure you that the BDT remains firmly committed to this area and will endeavor to assist implement whatever goals arise from your deliberations over the next few days

Ahmed Laouyane

Director
Telecommunication Development Bureau, BDT
INTERNATIONAL TELECOMMUNICATION UNION (ITU)

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

Document WTIM96/6-E
18 March, 1996
Original: English

World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: ITU/BDT, Michael Minges

TITLE: THE STATE OF TELECOM STATISTICS WORLD-WIDE

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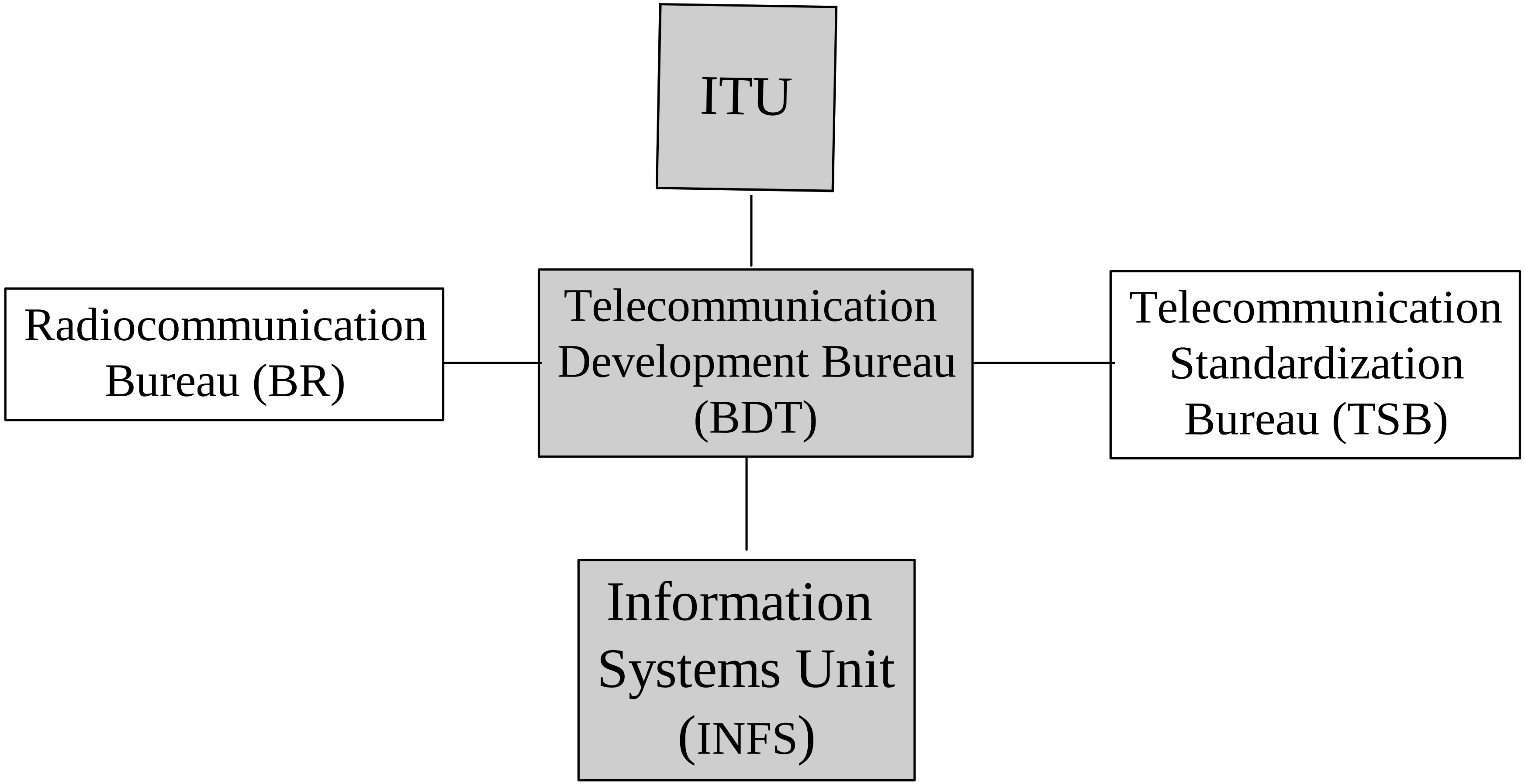
The state of telecommunication statistics world-wide

Michael Minges

World Telecommunication Indicators Meeting

Geneva 19-21 March 1996

ITU & Telecommunication indicators



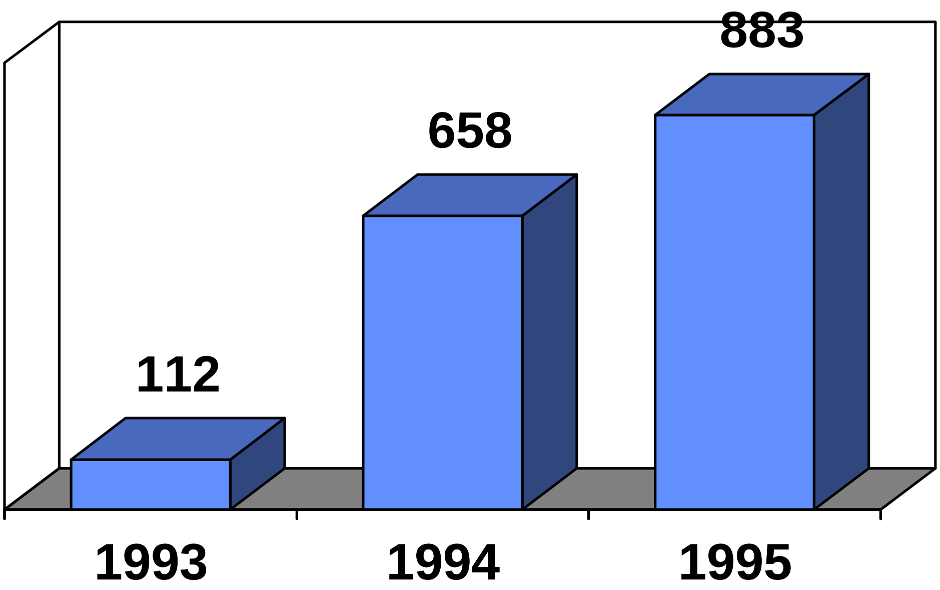
ITU Telecommunication indicators activities/products

- Collecting statistics from 200+ countries
- Harmonizing, correcting and entering into databases
- Adding value via derivations / calculations and analysis

- World Telecommunication Development Report
- Regional telecommunication reports
- Electronic databases
- External requests

Demand for telecommunication indicators growing

External requests for information about ITU telecommunication indicators



Factors driving interest in telecommunication indicators

- Policy changes
- Importance of telecoms in economy
- Commercialization of operators
- Regulation

Performance indicators

"As policy-makers come to review the first round of changes, and perhaps plan a second round, they need some yardstick by which to evaluate the success or failure of their policies. This means that policy-makers must try to define a set of indicators which permit comparison with other international PTOs."

25 indicators covering:

- tariff comparisons
- tariff structure
- Quality of service
- Productivity & Efficiency

OECD. *Performance Indicators for Public Telecommunications Operators*. OECD, Paris, 1990. ICCP # 22.

Country comparisons

"The underlying aim of the Bureau of Industry Economics' report is to compare Australian performance in the provison of telecommunications infrastructure and services with international best practice."

Australian Bureau of Industry Economics. *International Performance Indicators: Telecommunications 1995*. Australian Government Publishing Service, Canberra, March 1995.

Australia, Best and Worst Observed

Indicator Australia	Best	Worst
-Business Charges 18/28	US	Canada
-International Charges 14/24	Norway	Japan
-Fault clearance 15/19	Neth.	Taiwan
-Mobile Penetration 8/30	Sweden	Turkey
-Digitalisation 23/30	Hongkong	Austria
-Cardphones 2/25	Japan	Norway
-Revenue p. Employee 19/27	Switzerland	Turkey
-Lines p. Employee 26/30	S. Korea	Thailand
-Partial Labour Productivity	US	Aust.

Benchmarks

"...the need for new approaches to performance assessment and benchmarking for best practice in the dynamic global telecommunication industry. The metrics traditionally used in this industry are based on a regulated and monopolistic model. New metrics for a competitive global industry should focus on customer requirements. Moreover, the metrics and indicators should be part of a framework which is structured around a discrete set of issues or concerns that are of continuing interest to stakeholders in the industry."

8 performance attributes of telecommunication firms:

1. Customer satisfaction
2. Service quality & reliability
3. Cost & price structure
4. Speed and responsiveness to market
5. Global access & interoperability
6. Technology & innovation
7. Fulfillment of franchise requirement
8. Productivity of resources & assets

CTM. *Benchmarking for Best Practice: A Performance Assessment Framework for the Global Telecommunications Industry*. University of Southern California, forthcoming (1996).

Statistics for regulators

"For OFTEL to make progress towards meeting its goal of providing the best possible deal for the customer ... it was felt that a better and more detailed understanding of the telecoms market in the UK was needed. To assist with this, an exercise was undertaken to obtain authoritative market statistics on telecoms services."

PSTN retail call minutes, by type of call and customer (shown in million of minutes)

1993-94

Local calls	
Business	22341
Residential	44839
National calls	
Business	14665
Residential	16338
International calls	
Total	3221

Office of Telecommunications. *The UK Telecommunications Industry: Market Information*. OFTEL, London, February 1995.

Issues

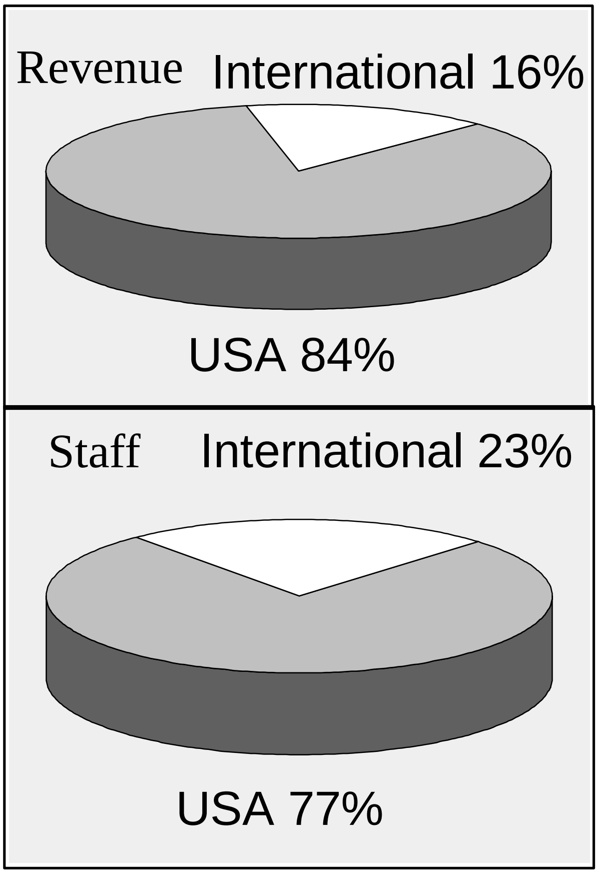
- Industry transition
- Specialization
- Globalization
- Convergence

Confidentiality

"The data which you seek for the Report is not available to us in the Department. All ITU requests for data are of course circulated to operators, but on this occasion they are unable to assist."

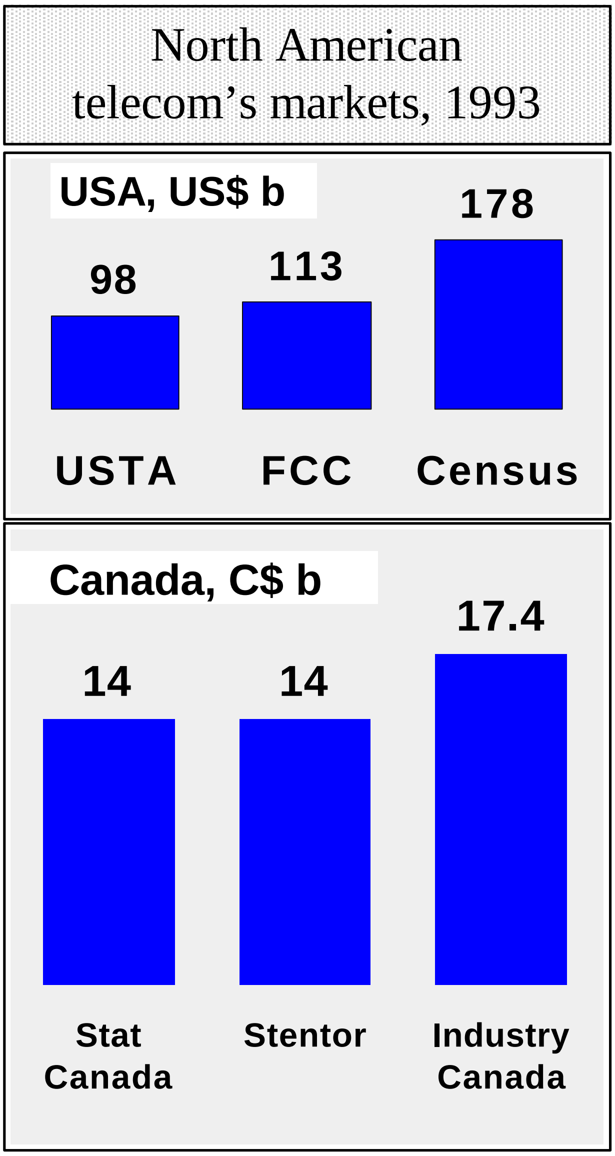
Globalization

GTE's:



"A decade ago, telecom statistics listed in a company's report would have generally referred to activities within the country. Since then, telecommunication operators have branched out from their purely locally markets to establish a presence in different countries."

Specialization



"The specialization problem arises from too narrow an interpretation of the telecommunication sector. This is an issue in North America where telecommunication statistics tend to be a function of regulatory practices. As a result, it is difficult to establish an **overall picture** of the industry."

Convergence

"The distinction between telecommunications, broadcasting and computing is blurring. Telecom companies provide cable television as well as data transmission and online services."

Optimism

- Regulators more involved
- Operators less sensitive
- Statistical agencies interested
- International, regional and quasi-official initiaves
- Government interest
- Collaboration growing

INTERNATIONAL TELECOMMUNICATION UNION

**TELECOMMUNICATION
DEVELOPMENT BUREAU**

INFORMATION SYSTEMS UNIT

**Document WTIM96/8-E
18 March, 1996
Original: English**

**World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)**

SOURCE: ITU/SPU, Tim Kelly

TITLE: PERFORMANCE INDICATORS FOR PTOS: AN UPDATE

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Performance Indicators for Public Telecommunication Operators: An update

Tim Kelly, ITU

"World Telecommunication Indicators", Geneva, March 19th 1996

In the beginning, defining telecommunication performance indicators was relatively simple ...

But then life got complicated ...

In 1988, OECD launched a new work programme on comparative costs of telephone calls.

Programme extended in 1989 to cover other telecommunication performance indicators

In 1990, OECD report published: "Performance Indicators for Public Telecommunication Operators"

Performance Indicators: Then and now ...

- Performance indicators mainly concerned with tariffs networks & QoS
- Indicators mainly used by PTO managers and regulators
- Indicators mainly presented historical trends
- Operators happy to share data

- Indicators needed for market opportunities, policy evaluation and regulation
- Indicators also used by users, shareholders, consultants, investors & journalists
- Major interest is in forecasts and market opportunities
- Operators regard much data as commercially confidential

Tariff comparisons: Then and now ...

- Similar tariff structure applied to all customers
- Most countries had only one supplier
- Telephony service relatively simple (vanilla flavour only)
- Tariff changes introduced infrequently
- Limited options for international service

- Many users eligible for some type of discount scheme
- Many countries have multiple suppliers
- Many optional features available (e.g. itemised billing, call forward etc)
- Tariff changes and new options introduced regularly
- Multiple options for international service (e.g. callback, ISR)

Tariff baskets: Then and now ...

Six baskets defined:

- Business telephony
- Residential telephony
- International telephony
- Mobile communications
- X.25 data communications
- Leased lines at 9.6 kbit/s, 56/64 kbit/s and 1.5/2.0 Mbit/s

Comparisons between countries

- Additional telephony baskets to take account of usage discounts (e.g. small businesses, multinationals, elderly)
- Combined national and international telephony basket
- Additional baskets needed for Internet, ISDN, digital mobile (roaming), PCS, ATM etc

Comparisons between operators within countries

National telephone tariff basket: Then and now ...

November 1989:

Business basket = US$931, 2'634 calls

Residential basket = US$346, 920 calls

<u>Business basket:</u>

Iceland, 1st
Sweden, 2nd
France, 10th
Italy, 11th
UK, 13th
Japan, 14th
Germany, 17th
Spain, 18th
USA, 19th

January 1995:

Business basket = US$908, 2'646 calls

Residential basket = US$387, 964 calls

<u>Business basket</u>

Iceland, 1st
Sweden, 3rd,
UK, 8th
France, 9th
Japan, 10th
USA, 12th
Germany, 15th
Italy, 20th
Spain, 21st

Changing paradigm for international telephony

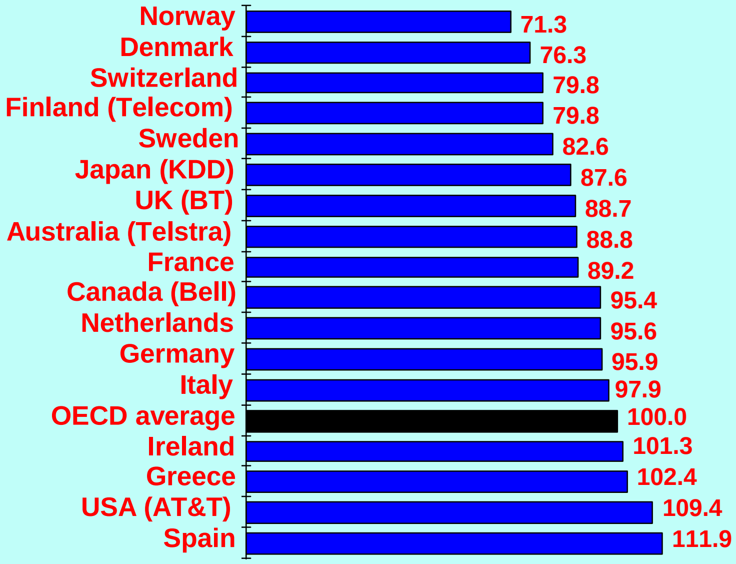
Old regime (pre 1970)

- International telephony a jointly-provided service
- Monopoly service provision
- Traffic travels mainly over Public Switched Telephone Network (PSTN)
- Voice traffic dominant
- Balanced traffic flows
- Exchange rate stability

New regime (post 1990)

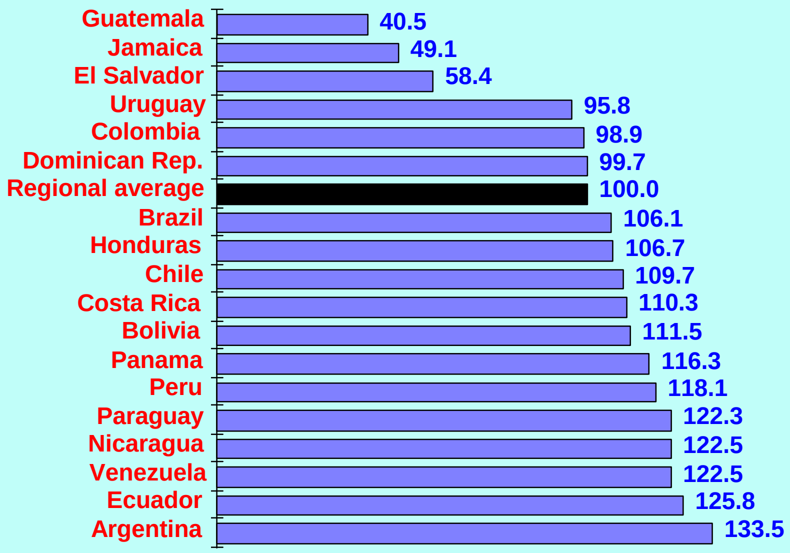
- International telephony a traded service
- Competitive Service Providers (CSPs)
- Traffic over PSTN, leased lines, private nets, Internet, ISR, CSP networks etc
- Multimedia traffic
- Imbalanced traffic flows
- Exchange rate instability

Tariff imbalances: OECD International tariff basket, January 1995



Source: OECD. Based on call-pair methodology and expressed in Purchasing Power Parities.

Extending methodology to other regions: Americas, January 1995



Source: ITU. based on OECD call-pair methodology and expressed in US$ exchange rates

Quality of service indicators: Then and now ...

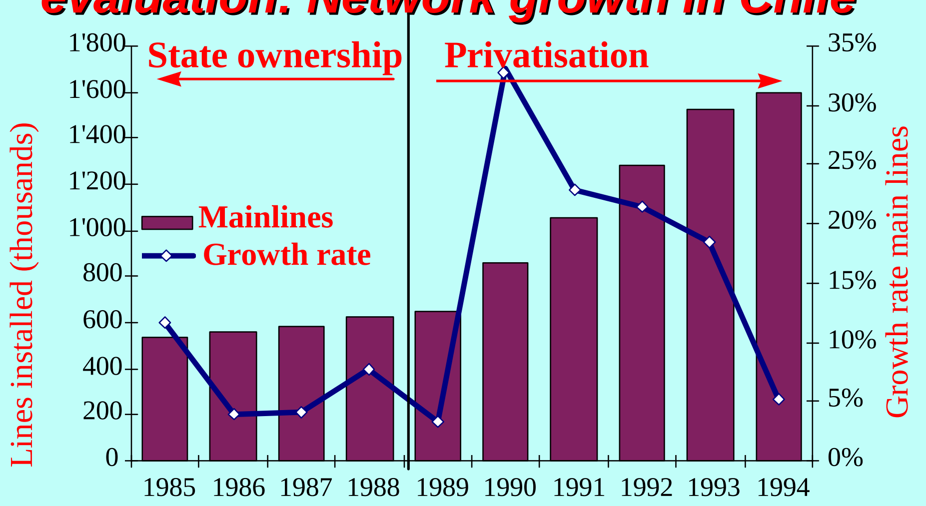
- Six main indicators selected covering: waiting lists, payphones, call failure rates, faults per line, fault repair time, and operator service
- Additional features: customer satisfaction, transmission quality, account queries, accuracy of directory services

- Key measure is customer satisfaction measured by level of “churn” between operators
- Technical network quality important as data compression grows (esp. mobile)
- Bundling of features in basic price
- Low probability/high magnitude events (e.g. fire, software crash)

Information requirements of regulators

- **For policy analysis**
  - ⇨ Comparisons before and after policy change
  - ⇨ Aggregation of national statistics to allow comparison with other countries
- **For regulatory purposes**
  - ⇨ Tariff rebalancing including facilities charges to other service providers
  - ⇨ Market share, growth rates
- **For customers**
  - ⇨ Quality of service indicators
  - ⇨ Handling of account queries

Performance indicators for policy evaluation: Network growth in Chile



Main lines installed and growth rate, Chile
Source: ITU World Telecommunication Indicators Database.

Objectives of performance measurement: Then and now ...

In 1990 OECD publication, objective of performance indicators defined:

"How can the performance of a public telecommunications operator be measured, by what standards should it be judged, and how does it compare with similar companies in other countries?"

1996 World Telecommunication indicators Conference, proposed objective:

"Which performance indicators should telecommunication regulators and PTO managers monitor, with what frequency, for which types of user, and what reporting requirements should be imposed?"

Session 2: Tariffs

A review of tariff comparison methodologies and solutions for defining appropriate comparisons in an age of increasing tariff differentiation.

"The OECD Tariff Models"
Yuji Kato, OECD

"Tariff comparisons and monitoring"
Andrew Dickson, BT

Tuesday
19 March

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SOURCE: OECD, Yuji Kato

TITLE: TELECOMMUNICATION PRICING INDICATORS BY THE OECD

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Telecommunication Pricing Indicator by the OECD

Yuji KATO / OECD

ITU World Telecommunication Performance Indicators Meeting

19th, March

ITU, Geneva

Introducing the OECD tariff baskets and time series

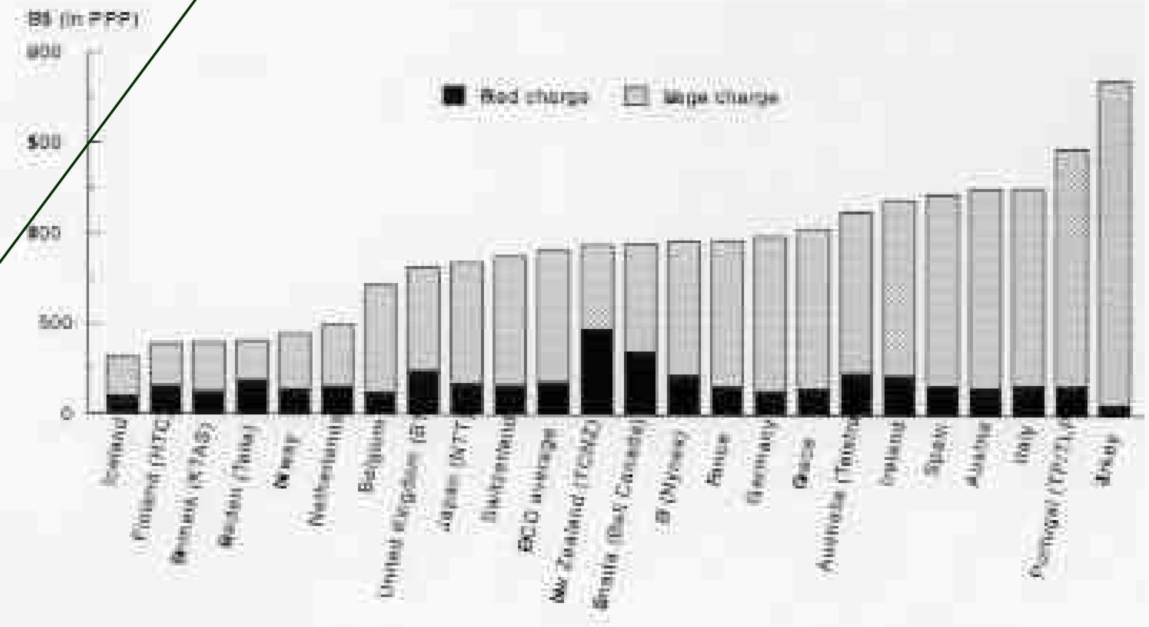
Telecommunication services in 25 OECD countries from 1990 to 1995

- PSTN (Business and Residential)
- International (Business and Residential)
- Leased line (56/64 kbits/s, 1.5/2 Mbits/s)
- Mobile (Business)
- Packet switched Network (X.25)

How the models constructed?

- INPUT
- In past data on annual basis
  - » Installation
  - » Monthly rental
  - » Usage
- Assumptions
  - » Call distribution
  - » Usage volume, etc...

- OUTPUT
  - » Indicator
  - » (Tariff baskets)



How the models designed?

- Data (Tariff itself)
  - » Yearly questionnaire by the OECD
  - » Quarterly data collection by EURODATA
- Assumptions
  - » Reviewed in the Biennial Workshop on Telecommunications Performance Indicators
    - – Last meeting, September 1995
      - Tariff Comparisons in the competitive markets
      - Indicators for mobile telecommunications
      - Indicators for information infrastructure, etc.

Problems

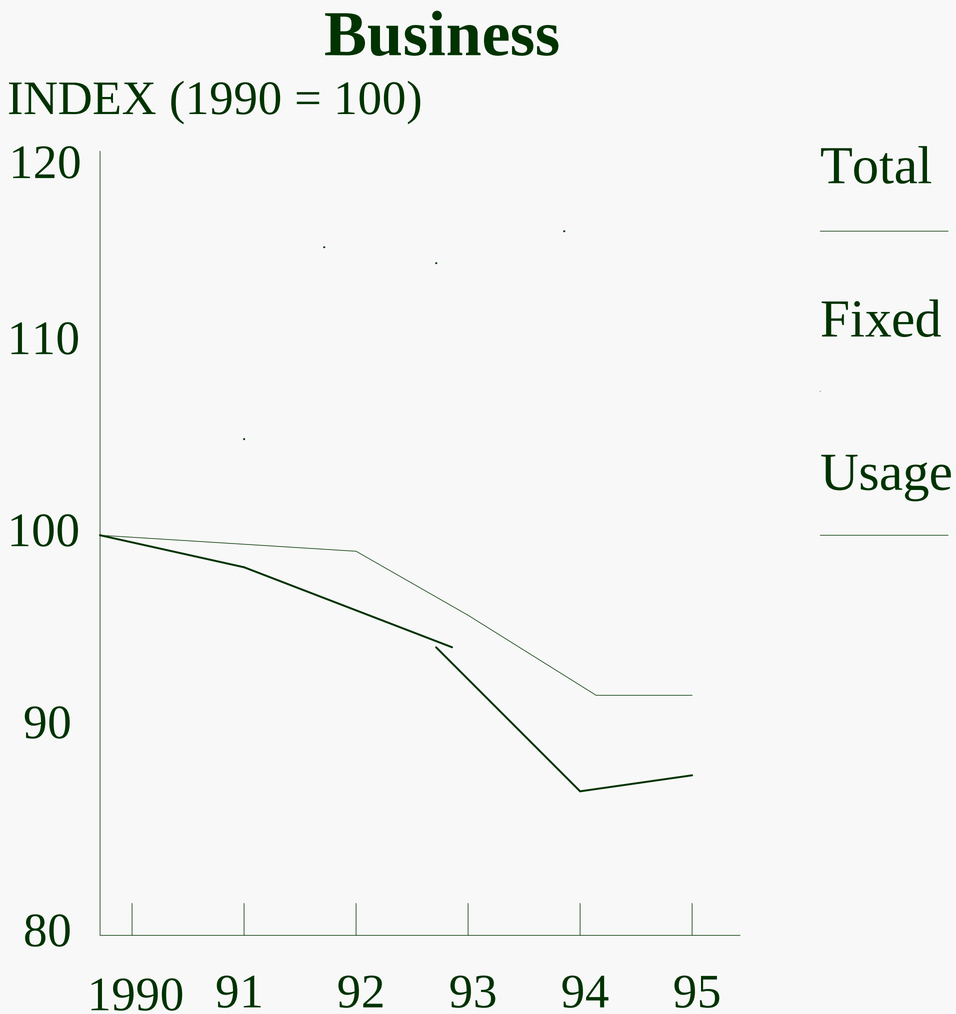
- Data (Tariff itself)
  - Getting complicated with the sophisticated tariff options, especially in competitive market
- Assumptions
  - How could they be changed while keeping the consistency for time series data?

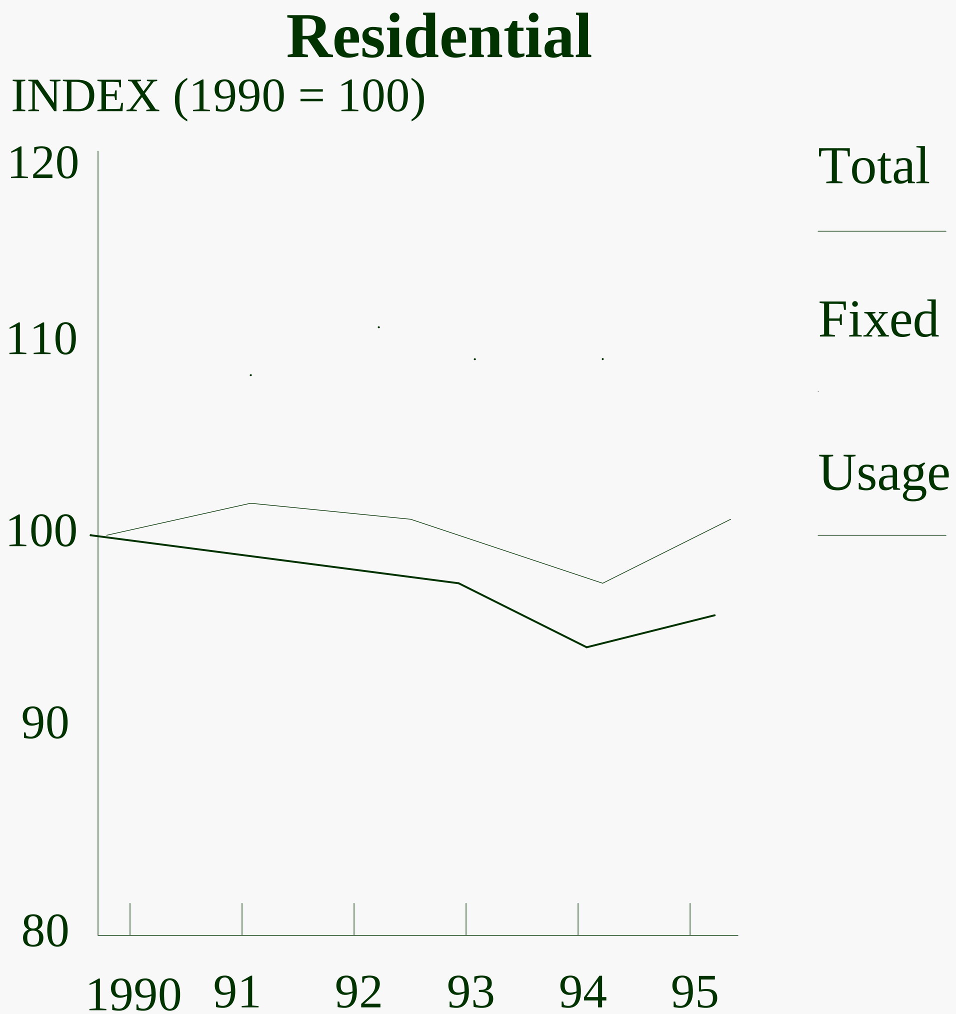
Tariff Time Series

Monitoring Tariff Trends in the OECD

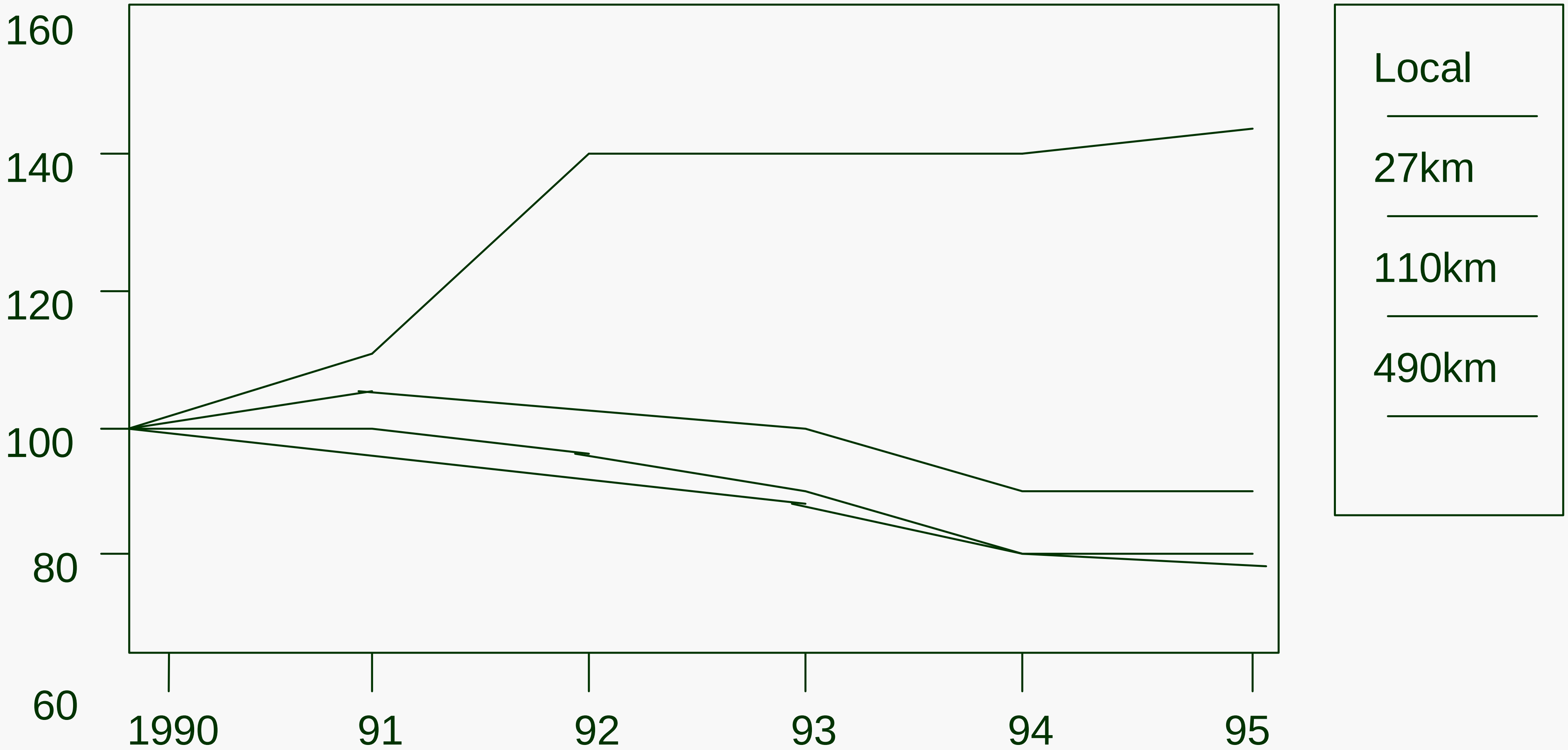
- Time series of **Fixed**, **Usage Charges** and **Total Charge**
- Time series of Calls over different Distances
  - » **Distance Rebalancing**
    - – 3 Km (Local); 27 km; 110 km; 490 km
- Index approach to give all countries the same weight
  - » Base Year: **1990 = 100**

Monitoring OECD Tariff Trends





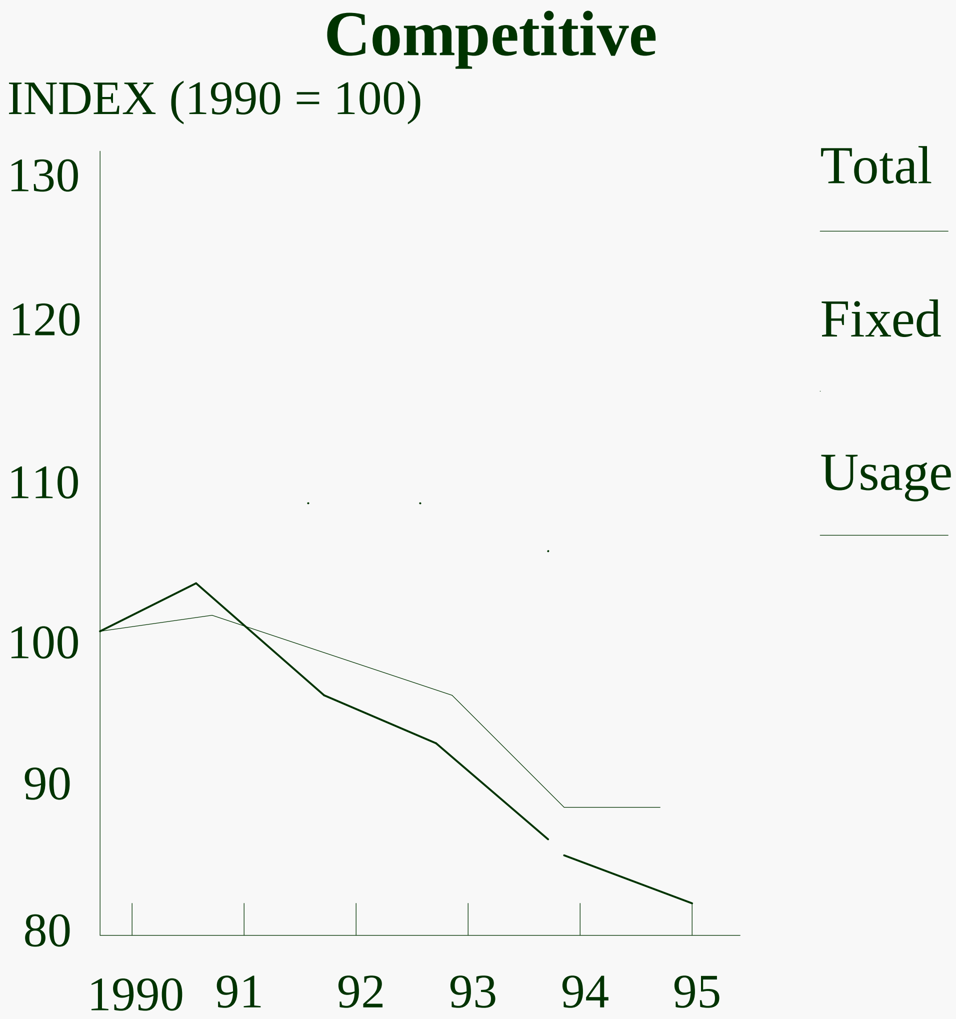
Monitoring Tariff Rebalancing by Distance

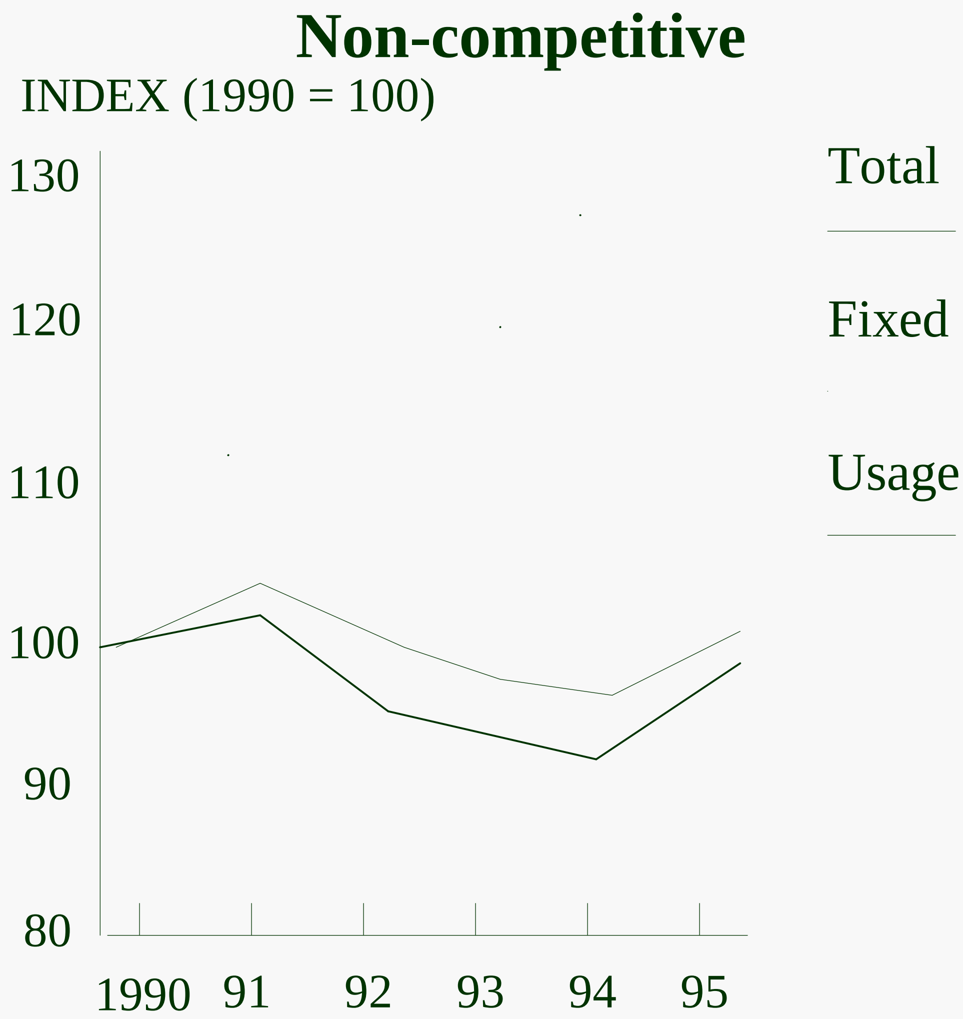


Comparative Policy Performance

- Tariff Trends in Markets with Infrastructure **Competition** and **PSTN Monopolies** in terms of the **Total Basket Cost**
- Comparative rebalancing between **Fixed** and **Usage Charges**
- Comparative rebalancing between Usage Charges **(Local -- Long Distance)**

Example: Business Basket Pricing Trends



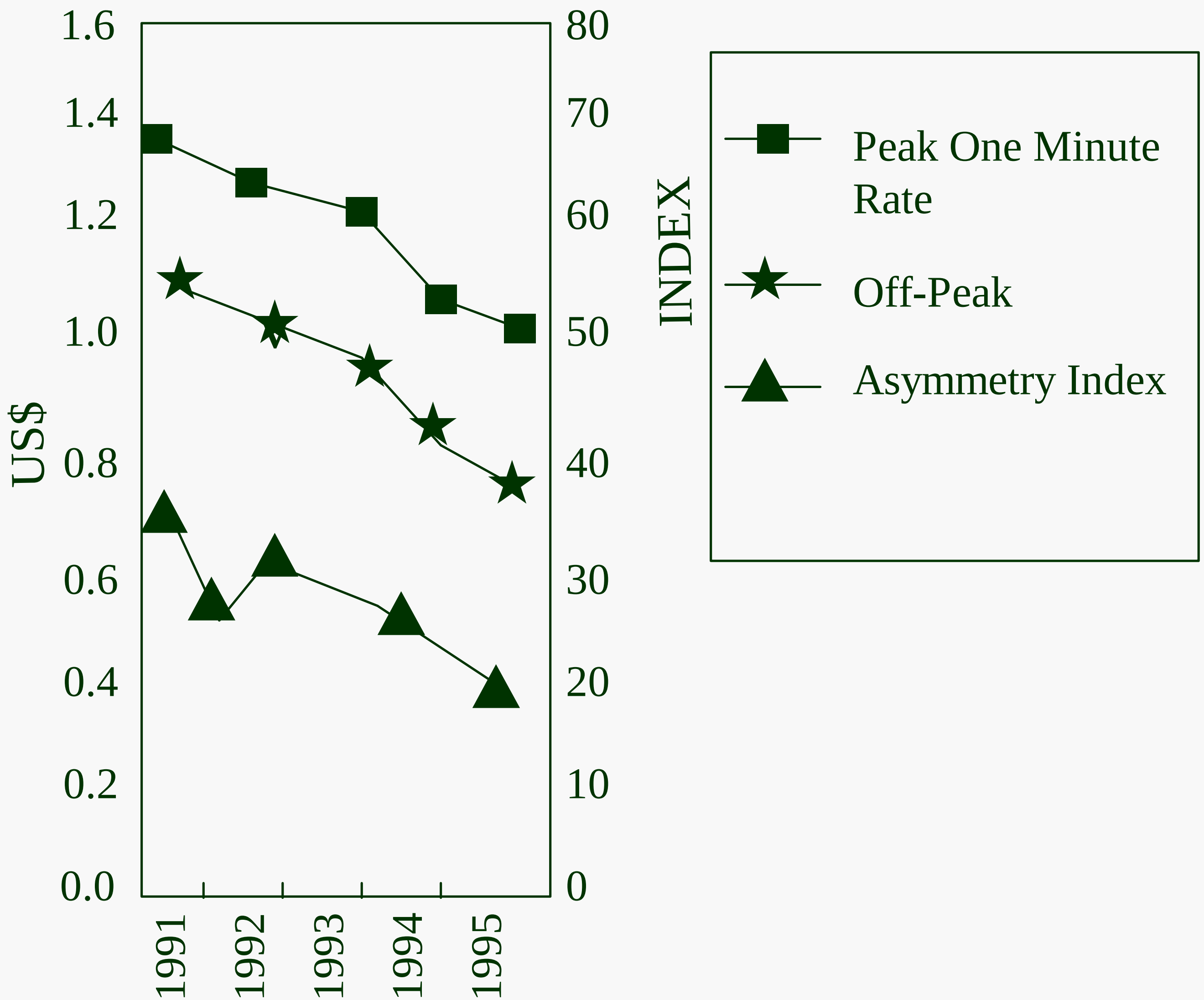


Comparative Distance Rebalancing

Other Tariff Trends Analysis

- International tariff trend
- Accounting rate trend
- Leased Line (56/64 Kbits/s & 1.5/2 Mbits/s)

Trend in International Tariff (1991 - 1995)



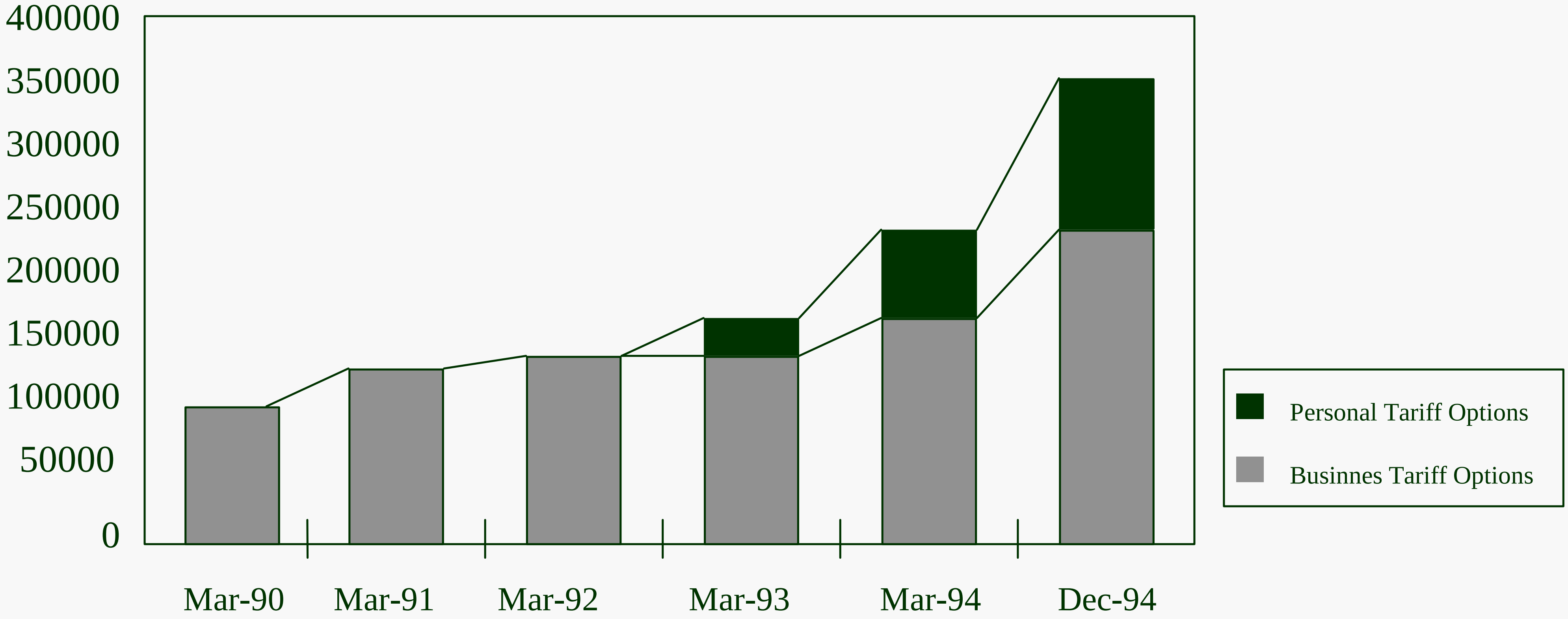
- Downward Trends in Collection Charge
- Decreasing Price Asymmetry
- Discount which is not shown in standard tariff

Questions

- Competitive markets
  - » Diversified tariff options
  - » How we can adjust the models?
- New Services
  - » Do we need new price indicators for information age?

Mobile Communication
Personal tariff option

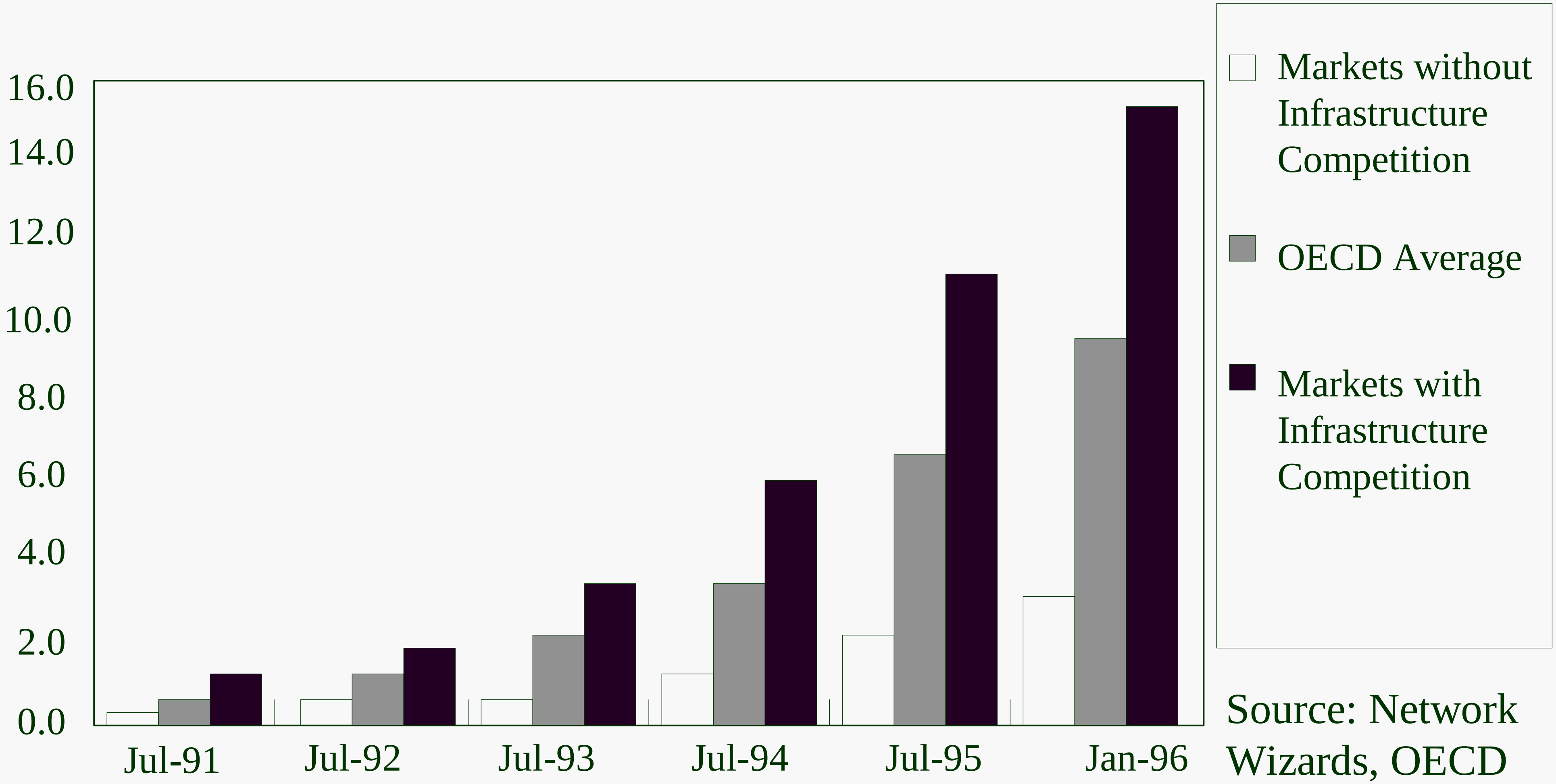
Tariff Diversification and Subscriber Growth in the UK



New Comparisons

- Access to the Internet
  - » Leased Line Access
  - » “Dial-up” Access
- ISDN Basket
- Cable - Television / Telephony

Internet Growth and Market Structure

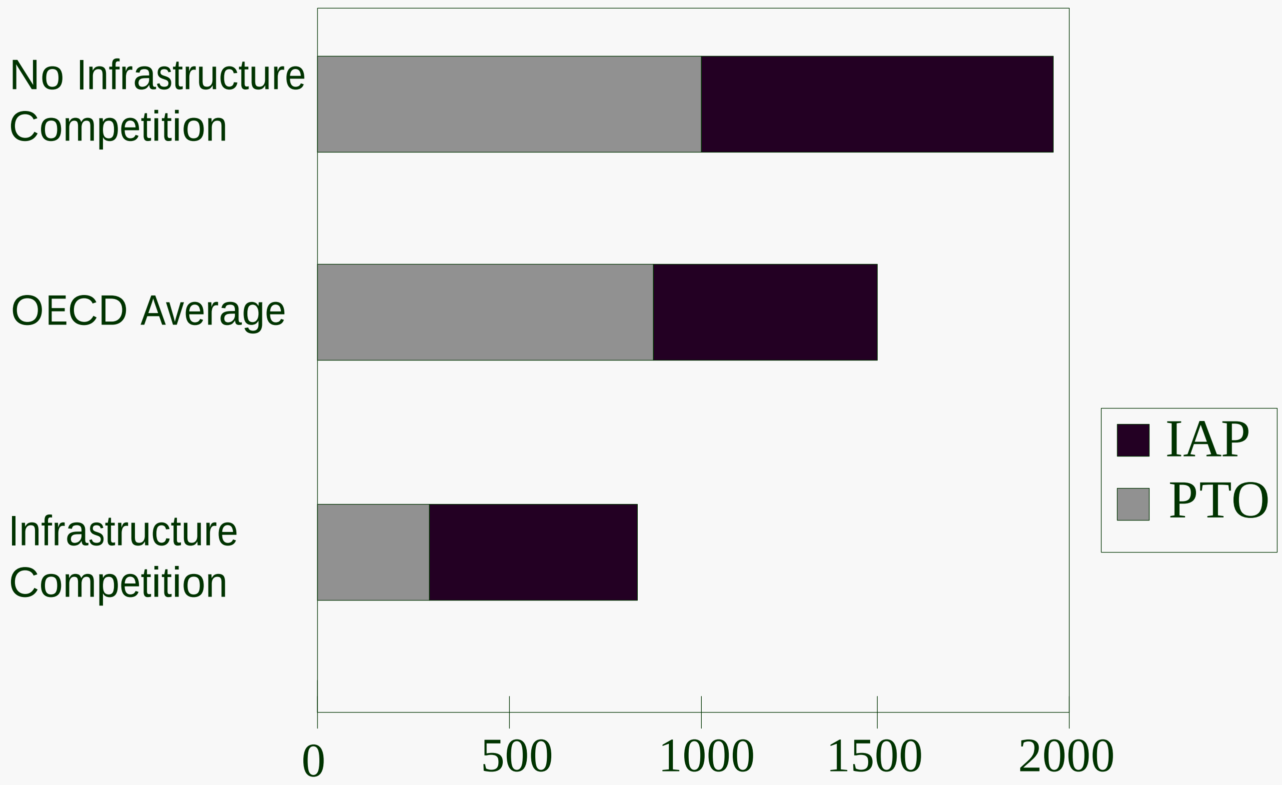


Source: Network Wizards, OECD

Internet Baskets (Dial-Up)

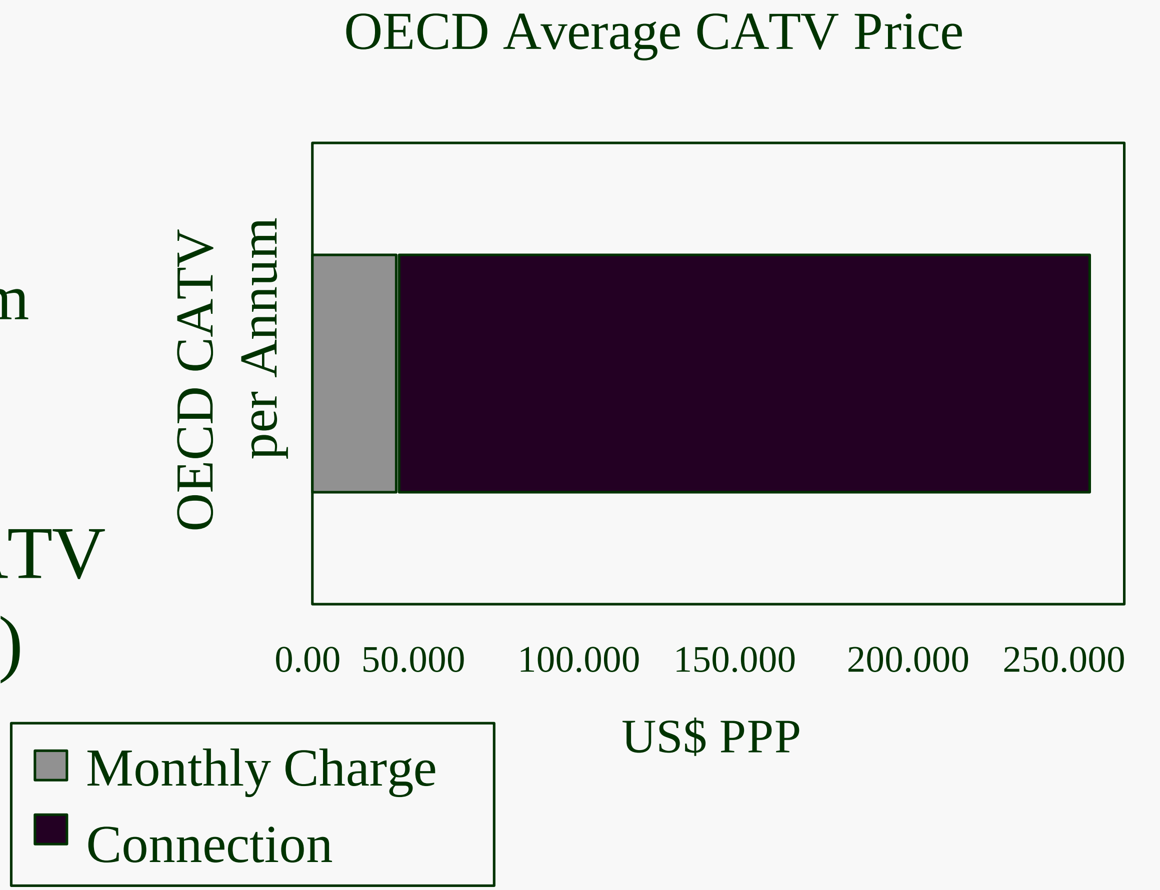
- Includes 20 & 30 Hours per Month
  - » PTO Local Call Rates
  - » Connection/Rental
  - » Peak/off-peak
  - » IAP Access Charges
- Output: Internet Basket 240 &360 hours

Internet Access via "Dial-up": 240 Hours of Local Call @ Peak rates per annum, August 1995



Measuring Cable Television Pricing

- CATV Basket
  - » Connection (Spread over 5 years)
  - » Monthly Charge (Basic or Minimum Service)
  - » Data Collected for Premium Service (e.g. Pay Movie Channel) but excluded
- Add New Service (e.g. CATV telephony, Internet Access)



Summary

- New demand
  - » New usage pattern - ex. Internet Access traffic
    - ⇨Continual effort by the Workshop
- Competition
  - » Complex discount Scheme $\longrightarrow$?
- New Services
  - » Internet Access Price
  - » ISDN
  - » Cable-TV/Telephony

Further Information and Update

- Please refer to OECD WWW home page; http://www.oecd.org/dsti/tisp.html
- Forthcoming;

  OECD Communications Outlook 1997

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TITLE: TARIFF COMPARISONS AND MONITORING

Tariff Comparisons and Monitoring

A presentation to 19-21 March 1996 ITU Meeting, Geneva

by
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Overview

• Uses of internation tariff comparisons
• Competition in the UK
• National Competitive Comparisons
• Problems posed by competitive comparisons
• Methods of competitive comparisons
• Price Perceptions

International tariff comparisons

- subset of wide range of comparisons
- aid to regulation
- source of pressure upon regulated companies
- performance indicators
- not for detailed national price monitoring

1984 Analysis

- Price Control of newly privatised BT, set by DTI and later taken over by Oftel
- analysis of international tariffs for calls and rental trends
- trend comparison with 19 countries 1967-82

1984 Analysis (cont)

- domestic rentals, UK 5 out of 9
- UK worst for local calls
- long distance calls, UK 4 out of 7
- UK, 1,5% below inflation, average 2.5%

Sequence of BT price caps

- RPI-3% 1984 - 88 covering 39% of revenue
- RPI-4.5%. 1989 - 90 covering 49%
- RPI-6.25, 1991 - 92 covering 57%
- RPI-7.5%, 1993 - 96 covering 59%

1996 Analysis

- Undertaken by ANALYSIS consultancy
- Using BT basket average BT residential customer fourth out seventeen
- Using BT basket average BT business cutomer second out seventeen
- Relative improvement in 1986 and 1989 position with a BT basket

Current UK competition

- Basic split between direct and indirect competition
- Direct competition providing lines and calls
- Indirect competition for national and international calls
- Mobile growth continues rapid growth

Current UK competition (cont)

- Main indirect supplier is Mercury - 10 years
- smaller national calls competitiors e.g. Energis, Scottish Telecom
- wide range of resellers both for national and international calls
- Mercury residential and business focused
- Other indirect competitors mainly business focused

Current UK competition (cont)

- Main direct suppliers are BT, cable companies, Mercury plus some operators in urban areas
- all direct suppliers except BT are geographically restricted either by franchise or rate of investment
- cable companies can bundle TV/entertainment with telephony and report rapid growth in take up of service

UK Competition Summary

- wide range of competitors both direct and indirect
- most cutomers have a choice of least one supplier
- customers beginning to place more value on qualiity of service, features and relationships
- industry widely regarded as most competitive in world

Competitive comparison issues in UK

- obligation to publish tariffs
- lack of tariff structure consistency
- less cooperation between partie
- dual-sourcing leading to sampling difficulties

Competitive comparison issues in UK (cont)

- operators geographically restricted
- calling plans aimed at special customer groups
- niche operators only providing some service
- cable companies bundling TV and telephony

Competitive comparison issues in UK (cont)

- use of advertising and sales materials to influence perception
- relation of perception to reality
- legal intervention and advertising control
- value of non-price features, e.g. call waiting
- mixtures of technology

Price perception

- recent NOP study for BT
- 600 company directors, senior managers and owners interviewed
- 90% claimed to be well informed about business costs and prices and 85% cited this as reason for business failure
- … but estimated national calls at twice cost
- … and USA calls at almost three times cost

Other price perception discoveries

- call costs were more baffling than other products’prices
- aware that call prices were coming down
- on a lighter not 90% knew price of beer but only 10% knew Ban of England base rate

Competitive comparison methods

- baskets (carrier based, national, local)
- own customer data
- individual customer data
- summarised customer data, segmented by spend or site size
- services, e.g. sample calls, access

Recent Published Studies

- Residential customers study in November 1994 quality assured by Coopers and Lybrand
- Business study in November 1995 by Touche Ross Tlhmatsu International
- resulting from the earlier discussion the studies covered Mercury where they offer a national published tariff

Competitive Studies

- summary resutls aimed at customers not experts
- “ Am I better off with BT or company X?”
- sufficient detail to support a technical case
- independent acceptance of assumptions
- work carried out independently

Competitive Studies (cont)

- influence price perception
- segmented analysis
- large calls samples summarised into segments

Residential Study

- Sample of 500,000 customers for period of 1 month
- various segments >£60/qtr calls
- apply best discounts where applicable
- sensitivities to etect any bias

Business study

- Review of 28000 customer sites and almost 20 million calls from 1 month
- again focus on BT call spend over £60/qtr
- apply discounts where possible and compare to all competitors avilable tariffs
- sensitivities to detedt bias

Residential Study Results

Typical Customer Spend on Calls per quater	£60-80	£80-100	£100-150	£150-300	£300+
% amount by which BT Cheaper	2.0%	2.6%	1.8%	1.3%	1.3%

Business Study Results

Typical Customer Spend on Calls per quater	£60-100	£250-500	£500-750	£1000-2500	£2500 5000
% amount by which BT Cheaper	5.1%	2.3%	2.0%	1.0%	0.7%

Conclusions

- International tariff benchmarking still important to BT
- Competitive comparison presents different problems; long way from resolution
- BT becoming more interested in competitive comparisons than international comparisons
- UK focus shifting from international benchmarking to competition and customer choice

Session 3: Traffic

Traffic statistics are an important indicator of telecommunication usage. They also provide insightful economic and social perspectives. How are alternative calling procedures and technological changes affecting traffic measurement? What is the best unit for measuring traffic (calls, pulses, minutes, megabytes, erlangs)? How can confidentiality concerns be balanced against the crucial importance of traffic statistics? Are current statistics sufficient or is greater diversification needed (e.g., usage by subscriber, usage by service). What happens when a growing amount of communications traffic is data and not voice?

"The New Demand for Telecoms Traffic Data: From MiTTs to Maps."
Greg Staple, Editor, TeleGeography

"International Traffic Modelling"
Philip Laidler, CSMG, UK

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SOURCE: TELEGEOGRAPHY (USA), Gregory Staple

TITLE: THE NEW DEMAND FOR TELECOMS TRAFFIC DATA: FROM MITTS TO MAPS

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Traffic Flows Are Shaping The Information Economy As Much As Policy

A. Introduction

B. Past Challenge

C. Current Issues

D. Future Agenda

Past Challenges

A. No data - telecoms is a "black hole" for traffic statistics

B. Definitions - the origin of MiTT: Minutes of Telecommunications Traffic

C. The birth of TeleGeography

Current Issues

A. What proportion of network traffic is still voice communications as compared to data, text and video?

B. What proportion of traffic is carried by the public wireline network as compared to other networks?

C. When will the Internet become a "public" telephone network?

D. How can traffic data and other telecoms indicators be more widely used?

Future Agenda

A. National Traffic Statistics

B. Survey Research

C. The Internet

D. Mapping MiTTs

The New Demand For Telecoms Traffic Data: From MiTTs to Maps

By Gregory C. Staple

The structure of the world information economy is being determined by traffic rather than policy ..."

Stewart Brand'

Ten years ago the American writer, Stewart Brand, expressed the unconventional view that traffic rather than policy would have the upper hand in defining the emerging information economy. Brand's insight was drawn from recent events in the financial markets. Since the 1'970s, national monetary authorities had fought a losing battle trying to peg currency values as larger and larger waves of money washed over the world's foreign exchange (FX) markets. By the mid-1 980s FX trading volumes worldwide often topped $200 billion daily -- more than the annual GDP of many countries.

At that time the telecommunications industry seemed to be sheltered from these powerful currents. Governments still owned most of the world's carriers and market entry by newcomers was strictly licensed. The Internet was largely a chat line for academics and IBM was king of the computer business.

What a difference a decade makes. Lest anyone doubt the power of traffic today, one need only lock to the Internet. While the world's carriers and governments debated how to bring multi-media to the market, the exponential growth of traffic on the Internet tipped the balance. Five years ago, the World Wide Web did not exist. Today Web traffic is the largest stream on the Internet and has swept aside the pet industrial policies of governments and corporations alike.

The power of the Internet to trump government policy is but one example of the rise of telegeography: satellites and telecom cables need no boundaries, but governments are defined by the boundaries they keep. This makes cross-border traffic flows much more than just another industry statistic. Traffic provides a seismograph of the pressures along a central fault line of our age. On one side is the indiscriminate geographic power of electronic communications networks and, on the other, the geographic particularity upon which all countries are founded.
Traffic statistics are also of vital importance to the telecommunications industry itself, of course. The greatest demand for traffic data in the next few years, however, is likely to be at the local rather than at the global level. Local competition is now squarely on the agenda in North America, Europe and Asia. For new market entrants -- whether wireline or wireless -interconnection charges are paramount.

Gregory C. Staple is the Editor of TeleGeography, the annual review of international telecommunications traffic and markets published by TeleGeography, Inc. He is also a partner in the Washington, D.C. communications law firm of Koteen & Naftalin, L.L.P.

How much should new carriers pay to terminate traffic on the incumbent's network? How much should incumbents pay for terminating traffic on the newcomers' networks? The answer to these questions, at least in the longer run, is likely to be traffic sensitive. Bill and keep or sender keep all (SKA) arrangements may be popular to "jump start" competitions But, if regulators truly want newcomers and incumbents to play on a level field, SKA arrangements must eventually yield to volume-based interconnect charges, at least in part. And that means traffic statistics.

Before looking more closely at this new demand for traffic data in the 1'990s, it may be helpful to see whence we have come.

A. Looking Back - Yesterday's

In 1987 when I first began to review the published data on telecommunication traffic, the industry was on the cusp of a new era. Since the 1 9th century, access to telecommunication services, and especially international services, had been limited by supply constraints. Progress was measured primarily by locking at statistics on facilities traffic (e.g., by data on telephone access lines, phones per capita, telephone cable miles. But by the mid-1'980s, very high capacity transmission facilities -- satellites and fiber optic cables -- and new digital switches had begun to shift the focus from supply to demand. Competition and market liberalization accelerated this shift, although the change was most marked for domestic long distance and international services. Thus, whereas the old environment favored the collection and dissemination of statistics on supply, the new age put a premium on information about demand and price -- on the volume and direction of telephone traffic, and on the composition of demand (e.g., the breakdown between long distance voice, fax and data traffic).

When one looked for national data about the volume of long distance traffic, however, or statistics on how much traffic was sent by one country to another, little information existed.3 In 1987 international telecom traffic was more or less a statistical "black hole." Although most carriers were enjoying a series of boom years, almost no coherent data escaped the industry's strong gravity fields. The problem was twofold: First, even where rudimentary statistics did exist, there was no common unit of account. Traffic was largely measured in calls, erlangs, billing units and pulses. This was not really surprising; most statistics were compiled for purposes of network planning (for engineers) or for internal accounting reasons (for tariffing). Traffic statistics were not intended for popular consumption, which points to the second problem.

Although telecommunication services already played a fundamental role in the economy, unlike other service industries, such as tourism, finance or transportation, only a handful of countries regularly published baseline statistics on the sector's principal output -- traffic. International reference sources, including the International Telecommunication Union (ITU) statistical yearbook, now defunct, mirrored these national deficits. Private publications, such as AT&T's The World's Telephones and the Siemens' International Fernsprechstatistik, were also inadequate. Data was often two years in arrears; there were serious omissions even for the richer countries; and there was no common unit of account.

Over the last decade, the collection and dissemination of statistics on long distance traffic has improved significantly, although much more needs to be done. A common unit of account, known as MiTT (Minutes of Telecommunication Traffic) is now used to compile most traffic statistics. This is particularly true for international traffic. The ITU, the Organization for Economic Cooperation and Development (OECD) and TeleGeography, Inc. (TGI), follow this convention in their industry yearbooks and related reports. This has greatly facilitated cross country comparison of traffic patterns over time. For example, route-by-route MiTT for over 60 countries are published in TGI's annual yearbook, TeleGeography.4 In addition, every two years, the ITU and TGI jointly publish an expanded compilation of route-by-route statistics.5 The next edition will be available in June 1996.

Second, the growing economic and social importance of telecommunications has lead more countries to publish rudimentary national traffic data. Typically the data includes the number of minutes or calls handled by a given carrier annually. Sometimes there is also a breakdown between "local exchange" and "long distance" traffic. Even such basic data, however, still is only available for carriers in approximately 30 to 40 countries. Consequently, today we know much more about the pattern of telecommunication flows between one country and another than we do about the direction and composition of most countries' domestic traffic. This statistical shortfall is likely to be less and less acceptable as we enter the age of local competition, and I shall return to this issue again later on.

B. Current Traffic Issues

The rudimentary statistical questions which we sought to answer only five years ago are rapidly being eclipsed by a number of more complex issues. Yesterday's traffic questions began with "How much?" and Where?" And while these questions are but partially answered, other questions now seem more urgent. They include the following:

1. *What proportion of network traffic is still voice communications as compared to data, text and video?*

Adopting a common unit of account for measuring traffic, such as MiTT, has always involved a risk. MiTTs are useful precisely because they are inclusive -- they are not service specific. A minute of fax traffic is treated just the same as a minute of conversation. So long as traffic on public telephone networks was reasonably homogeneous (i.e., voice calls) and other networks were primarily used for data traffic, such a broad definition made sense.

Today, however, one of the most pressing issues facing public telecommunication operators is the extent to which their networks are becoming heterogenous conduits. A key question now for carriers (and regulators) is often "what kind of traffic" not "how much traffic" traverses a particular network. The fact that voice, text and video traffic may use a common digital metric has, paradoxically, made the question more, not less important. This is because data traffic -- once the only kind digitized -- is now deregulated almost everywhere; market entry is unlimited and pricing is left to the market. Thus, as digital encoding and transmission technologies shift more traffic from the "basic" (regulated) to the "enhanced" (deregulated) category, the economics of telecommunication networks may be radically changed.

2. What proportion of traffic is carried by the public wireline network as compared to others?

The challenge of sorting out the composition of telecoms traffic in a digital world has been compounded by the rise of competing network infrastructures. Almost twenty countries permit competition among facilities-based telephone carriers and many more allow competition between wireline and wireless service providers. Private or leased line networks may also carry very large volumes of traffic in many countries. As a result, a public network which was once reasonably centralized and under common ownership has given way to an increasingly plural network infrastructure which has a multiplicity of owners. Some portions are vertically integrated -- others not; some carriers prefer to bundle local and long distance service or wireline and wireless service -- others do not or may not.

These developments have made the task of gathering uniform traffic statistics, by whatever metric, much more complex. Which carriers must file reports with the national regulators? How do you avoid double counting when a large proportion of each carrier's revenue (and traffic) consists of transfer payments to another carrier? How should traffic on leased lines be measured?

Some of these questions may be particularly difficult to answer in the international arena. Internationa simple resale (ISR) is a case in point. ISR involves the resale of international private line circuits fo switched traffic and has been favored by some countries in order to foster more cost-based internationa service. ISR traffic bypasses the existing accounting rate regime and is not subject to settlements o proportional return arrangements. There is anecdotal evidence that ISR has led to a significant decline ir both wholesale (settlement) and retail rates. But how much traffic is necessary to tip the balance? We may never know. To date, only the U.S. has required ISR carriers to file rudimentary traffic reports and as yet, few carriers have done so.

Industry and government have a similar interest in determining the extent to which cellular telephone and other wireless services, such as the new personal communication service (PCS), provides a substitute rather than a stimulus for wireline service. Yet, to my knowledge, no country, including the U.S., publishes even rudimentary comparative statistics on wireline and wireless traffic by local service area or subscriber class (residential/business). Thus, we also know very little about the extent to which year-on-year growth in network traffic is the cause or the consequence of the introduction of mobile services.

Nor do we really know how network switching patterns may change as the network becomes increasingly unwired. These issues are far from academic as Israel found out last Autumn when the unexpectedly large growth of mobile traffic, partly stimulated by the entry of a new cellular operator, overloaded the country's switching capacity. In Tel Aviv, many Israelis found themselves without a dial tone -- wireless or wired -- for the better part of a day.

3. When will the Internet become a "publics telephone network?

Gauging the future of the Internet combines the most difficult bits of the last two questions: How do you determine the volume and composition of Hoff-net" digital traffic? Until April

1995, it was possible to provide order of magnitude answers regarding Internet traffic by locking at the bitstreams transiting the main Internet backbone facilities in the United States which were government owned.6 Since then, however, the Internet's backbone networks have been privatized and a growing number of competing facilities have come on line so that there is no simple way to measure either the volume or the mix of Internet traffic.

Again, for telephone carriers and regulators this is much more than an academic issue: The rapid introduction of new software may make yesterday's e-mail medium tomorrow's conduit of choice for voice telephony. If that happens, a large portion of the circuit switched network may become "stranded investment", as economists say, Netscape Communications, which produces the leading internet browsing software, has announced that it will make audio conferencing capabilities a standard version of later releases. IBM has also announced that by the end of 1996, the companies personal computers will be pro-loaded with Internet voice conferencing software.

Baseline measurements of the voice traffic carried by the Internet and other packet switched data networks is also important for public policy. For example, in many countries the cost of providing telephone services to rural and low income users is underwritten by the local access or contribution charges paid by interexchange telephone carriers. These charges are frequently based upon the minutes of basic traffic which the interexchange carrier delivers to the local network. However, these per minute charges typically do not apply to access lines which are used for "enhanced" (e.g., Internet) services. In these circumstances, if the Internet begins to carry a significant volume of voice traffic, the existing charging mechanisms for recouping the fixed costs of the local exchange network and for universal service may become less and less tenable. Rudimentary Internet traffic statistics could provide an early warning system.

4. How can traffic data and other telecoms indicators be main-streamed?

In a world awash with talk about information superhighways and digital media, it is ironic that MiTT -- like many other telecom indicators -- is still part of a statistical back-water. Apart from a few industry consultants, business journalists and sector regulators, few people outside of the telecoms business are aware of the available data on telecoms traffic or of its potential applications.

The absence of traffic data in general interest publications can be explained, in part, by the way in which national statistics are compiled and disseminated. **Traffic data** is usually gathered (if at all) by regulators rather than by national economic or statistical agencies. Further, despite considerable efforts by some multinational groups (notably the OECD and APEC)7 country-by-country data on domestic traffic is hard to compare (local vs. toll calling areas may not be well defined) and rarely aggregated.

Likewise, publications on domestic traffic patterns are not easily obtained. The relevant regulatory documents have a limited national distribution and foreign circulation is de minimus. One obvious remedy is to distribute the core data in electronic fashion over the Internet and some regulators, such as the FCC and Oftel, have made significant strides in this direction.8 (So too has the IITU, which now publishes almost all of its indicator products on the Internet.)9 Let us hope that other countries follow suit.

Telecom traffic and other indicators also are more likely to reach potential users if they are published in an electronic format which is compatible with popular software in other business and scientific fields. For example, the ITU's indicator products (including the biennial report on international traffic data published with TGI) are now available on computer diskettes based on the World Bank's STARS program. STARS is compatible with the Lotus 1-2-3 spreadsheet program. Again, it would be helpful if national statistical agencies took similar steps.

Finally, the growing popularity of Geographical Information Systems (GIS) -- that is, computer based mapping programs -- offer an important new vehicle for bringing traffic and other telecoms data to a wider audience. The application of GIS to the telecoms industry is discussed further below.

C. Looking Forward: Where Do We Go From Here?

Meeting the statistical challenges outlined above will require a concerted effort by many different organizations -- public and private. Where should our priorities lie? I have four main suggestions:

1. National Traffic Statistics. It is time we shifted our statistical focus from the global to the local level. We know much more today about cross-border traffic flows than we do about the volume and mix of traffic within those borders. Yet the need for national traffic statistics arguably has never been greater. There is now a rough consensus that telephone and other communication services should be provided by competing operators and that both the long distance and local markets should be opened to competition. But there is also a rough consensus that the transition from a monopoly to a competitive market should not occur at the expense of the isolated, the poor or the handicapped in our populations. Indeed, many people see the transition to a competitive market as the best way to provide universal service and to expand consumer access to advanced services (e.g., by providing a data or video dialtone).

Neither competition nor universal service, however defined, will be possible without a complex new set of arrangements for interconnection and division of revenues. In some ways, countryby-country, we must invent the type of settlement arrangements which have long existed at the international level where, until very recently, foreign calls always involved at least two national operators. I do not mean to suggest, however, that the international accounting rate regime provides a model for local interconnection. On the contrary, a 50/50 split of wholesale rates and proportional return is neither desirable nor workable at the local level.

Nevertheless, just as the existing accounting rate regime could not function without detailed statistics on the net traffic balances between carriers, the administration and oversight of domestic interconnection arrangements are also likely to require baseline traffic statistics. Until circuit capacity and bandwidth become virtually free, the terms on which one local carrier (wireline or wireless) will pick up and deliver traffic sent to it by another carrier are likely to be traffic sensitive.

As mentioned earlier, to "jump start" competition regulators in the U.S. and elsewhere have proposed that new mobile operators interconnect with the fixed network on a bill and keep or sender keep all (SKA) basis.'° Similar terms are also being considered for competing local wireline carriers. In the international telecom industry, we have learned that SKA arrangements are economically attractive primarily where the traffic volumes are reasonably balanced in both directions. That is manifestly not the case when it comes to local exchange markets.

For example, even after five years of rapid growth by the cellular telephone industry, one of the major U.S. wireline carriers still terminates 94% of the overall traffic stream in its local service area." In these circumstances, incumbent carriers are likely to have a keen interest in developing traffic benchmarks to test the economics of any SKA regime and to devise more equitable long term arrangements for reciprocal (i.e., traffic sensitive) compensation.

Similarly, so long as regulators view long distance users as the primary source for subsidizing local exchange service in remote or high cost areas, the size of the subsidy and the basis for its collection are likely to be tied to traffic. But how much traffic will be required to provide a given subsidy? Should lines devoted to data traffic (Internet access) also be included? How will traffic be allocated to carriers serving rural or poor users when their is more than one carrier of last resort? How will these arrangements be monitored? Again, without an adequate set of traffic statistics, public policy on these and related universal service issues will almost certainly be compromised.

2. Survey Research. Many of the gaps in our current statistical knowledge are unlikely to be filled without extensive survey research. This is especially so for "off-net" traffic, such as the flows on international private lines and data networks. (More on that below.) Simply put, we cannot and should not reply exclusively on regulators and carriers to provide us with the traffic data we seek. We must get users and particularly groups of business users involved as well.

One might start with international private lines. They have proliferated since the late 1'980s. But except for some order of magnitude estimates about the number of circuits currently in use on major routes, I am unaware of any global data on the volume of MiTTs now carried by IPLs.

Survey research is also needed at the national level. Again, priority should be given to gathering longitudinal data on the changing mix of traffic originated on the public switched network. To do so, the telecoms industry might well borrow from their cousins in the television field by sponsoring telephone or modem diaries. Ideally, one would want to have diaries for every electronic terminal attached to a telephone or cable TV line at a given household or business. The data from a few thousand such diaries in a dozen or more countries would go a very long way toward answering some of the most important consumer and regulatory issues of the day.

3. The Internet. While Internet telephony is still in its infancy, within five years the Net may offer millions of people a practical alternative for low cost voice communications. At the same time, traffic on the public switched telephone network is likely to become more and more heterogeneous. The co-evolution of the Internet and the Public Switched Network (PSN) is now inevitable. In the circumstances, the need for baseline traffic statistics on Internet telephony and other services which compete directly with the PSN is obvious.

Compiling the necessary statistics, howeer, will not be easy. Because the Internet is based upon a packet-switched rather than a circuit-switched architecture, there is no one carrier and no single circuit used for an end-to-end transmission. The common unit of account is a packet of bits sent from one server to another not a minute of connect time. And, as mentioned earlier, while there was once a relatively finite number of backbone networks transiting almost all the bits sent from one continent to another, there are now numerous facilities.

Most of the large Internet providers currently accept bits from sister networks on a "peering" basis; no money **changes hands** and each Internet access provider is compensated by the monthly charges which it receives from its local subscribers. This system has worked rather well to date. But if the Internet is used for more and more real time voice traffic, the network probably will need to be partitioned on a de facto basis to accommodate it and today's peering arrangements are likely to evolve to a more market oriented set of relationships.

In managing the transition, rudimentary traffic statistics are likely to be essential for Internet and PSN operators alike. Few Internet networks will wish to carry all of their peers' voice traffic for free or to deliver very high volumes of bits to subscribers which pay only a small monthly fee. Similarly, as Internet telephony grows, PSN operators will need to adopt their wholesale (leased line) and retail offerings accordingly -- to decide where they wish to bid for Internet traffic themselves and where they merely wish to supply the underlying facilities. These circumstances provide an excellent opportunity for joint statistical venture.
4. Mapping MiTTs. The revolution in geographical information systems (GIS) for business probably offers the best chance yet to put telecom indicators on tomorrow's economic maps. The visual display of quantitative information -- to lift a phrase from Edward Tufted -- is almost essential for reaching a larger audience. And GIS is rapidly becoming the leading medium.

Maps are not necessarily preferable to graphs or charts in presenting locational information.'4 Rather it is the methodology behind GIS products that is becoming irresistible: GIS offers a common computer-based platform for integrating and displaying locationally specific data from diverse sources. In addition, unlike many other charting techniques, GIS software typically enables users to make sophisticated "what if" queries regarding the data set; to account for missing pieces; to test gee-demographic relationships; and to model scenarios.

The traffic data discussed here, like many of the other telecoms indicators addressed at this conference, have a very strong geographical connection. Most of the indicators the ITU and TGI publish are about nations or networks. These statistics do not exist in a vacuum. They reflect the demographic, economic and political realities of particular locales. Thus, the statistical appendix at the end of the ITU's annual development report begins not with telephone lines but with population and **GNP per** capita. GIS offers the ability to integrate this economic and demographic data with telecommunications.

Let me close by providing an example of how the U.S. telecom industry is already beginning to use GIS products to bring these kinds of data sets together. With the introduction of the new Personal Communications Service (PCS) in the U.S., many local wireless markets will have at least six or seven mobile service competitors -- two cellular telephone providers, three or four PCS licensees and two or more trunked mobile service operators. Competition will be fierce and marketing skills will be in demand as never before.

To help its members navigate this new terrain, the U.S. Cellular Telecommunications Industry Association (CTIA) has turned to GIS. Using a standard GIS software package (the ArcView platform) the CTIA has created a set of "Wireless SourceDisks" which permit users to analyze the demographic and economic characteristics of their current and potential markets service area by service area.'5 This wireless data base can be combined with other telecom data sets (e.g., on wireline networks) to create a fairly comprehensive view of the overall telecoms marketplace.

As yet, traffic data is markedly absent from the CTIA's Wireless SourceDisks and from the wireline data sets distributed by other vendors. But, as the competition for local exchange service brings more and more traffic data into the public domain, this shortfall is likely to be cured.

* * *

In sum, whether it be local competition or ISR, the rise of the Internet, or mobile services, the demands for traffic data in the 1'990s will plainly outstrip the demands of the 1'980s. The real question is no longer whether MiTT matter but whether the supply of MiTT products will be adequate -- service-by-service and country-by-country -- to meet the demand.

-- END --

Endnotes

1. Stuart Brand, The Media Lab, (Viking Peguin, London 1988), page 249.

2. The FCC has tentatively concluded that, at least for an interim period, interconnection rates paid by competing wireless telephone companies for local wireline switching facilities and connections to end users should be priced on a bill and keep and basis (i.e., bath the local wireline carrier and wireless provider should be charged nothing for terminating traffic). See Notice of Proposed Rulemakina, FCC 95-505, Common Carrier Docket No. 95-185, released January 11, 1996

3. See Gregory C. Staple and Mark Mullins, "Telecom Traffic Statistics -- MiTT Matter Improving Economic Forecasting and Regulatory Policy," Telecommunications Policv, June 1989, pp.105 128.

4. See, e.g., TeleGeocraDhv 1995 (TeleGeography, Inc., Washington, D.C. 1995).

5. See Direction of Traffic International Telecommunication Traffic Statistics (1983-1992) (International Telecommunication Unlon\TeleGeography, Inc., Geneva 1994).

6. See e.g., "NSF Traffic Growth, 1991-95" in TeleGeouraohv 1995, supra, page 64. Internet backbone data is also available at FTP: //nic.merit.edu/nsfnet/statistics/history.reports.

7. See e.g., Communications Outlook 1995, OECD, Paris 1995.

8. See the FCC's Web Site at http://www.fcc.gov/ for Oftel see http://www.open.gov.ukk/oftel/oftelwww/oftelhm.htm.

9. See also http://www.itu.ch/ for ITU's Web Site.

1O. See Notice of Proposed Rulemaking, supra note 2.

11. According to Pacific Telesis, 94% of wireline-cellular telephone exchange traffic terminates on its wireline network in California and 6% terminates on cellular telephone networks even though cellular traffic has grown at 20% annually in the 1'990s. Notice of Proposed Rulemaking, supra 40, note 60.

12. See e.g., Nathan Muller, "Dial 1-800-lnternet" Byte Magazine, February 1996, pp. 83-88; Jerry Michalski, "The Economics of Connectivity», Release 1.0, 31 December 1995. See also Jeff Mackie-Mason's Web site at the University of Michigan (http://gopher.econ.lsa.umich.edu/Econinternet/AIISubjects.html.)

13. See Edward R. Tufte The Visual Display of Quantitative Information (Graphics Press, Chesire, CT, 1984) and Envisioning Information (Graphics Press, Chesire, CT 1990). These two books are already classics in the field.

14. For an ingenious presentation of local calling data in a non-geographic format, see Steven G. Eick and Daniel E. Fyock, "Visualizing Corporate Data", AT&T Technical Journal, January February 1996, Vol. 75, No. 1., pp. 74-85.

15. For further information on the CTIA's "Wireless SourceDisks," contact catalog@ctia.org.

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

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(Geneva, 19 - 21 March 1996)

SOURCE: CSMG (UK), Philip Laidler

TITLE: INTERNATIONAL TRAFFIC MODELLING

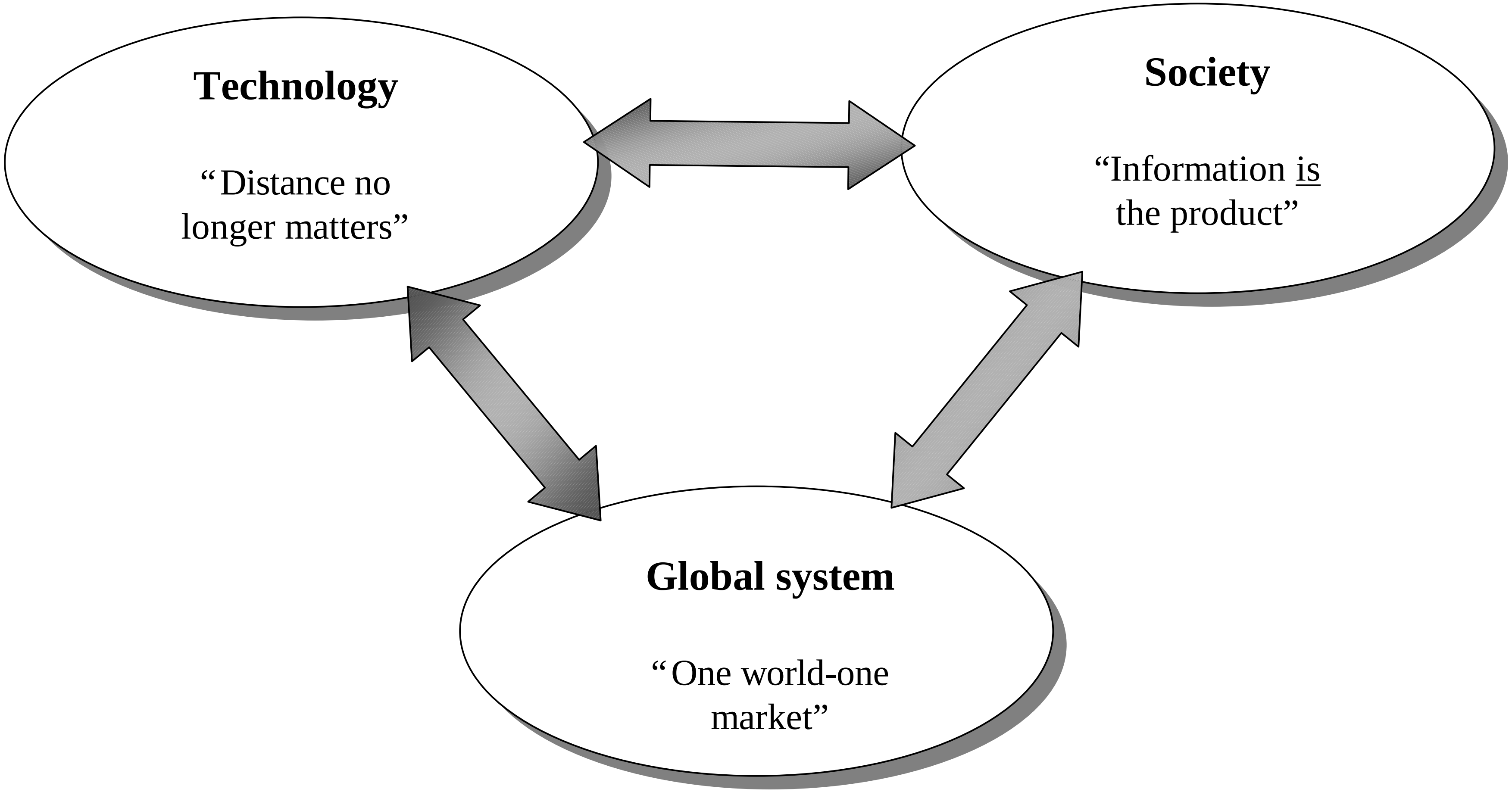
INTERNATIONAL TRAFFIC MODELLING

ITU WORLD TELECOMMUNICATION INDICATORS MEETING

Presented by Philip Laidler, Cambridge Strategic Management Group
Geneva 19 March 1996

CHANGES IN INTERNATIONAL TELECOMS

A number of forces are radically reshaping international telecoms



CHANGES IN INTERNATIONAL TELECOMS

These forces are re-writing the rules under which telecoms has operated for decades

Characteristic	Old System	Emerging Situation
Franchise	Monopoly	Competition
Key cost driver	Distance	Access
Pricing	Social/Political	Cost-based
Intercarrier relations	Contractual Accounting rate agreements	Stategic Market-based/refile and hubbing
Product	Switched voice transport	Multimedia Transport + Service
Industry consolidation	Vertical	Horizontal
Perceived role	Expensive luxury used sparingly and mainly by big business	The "glue" of the global village

REWRITING THE RULES

Operators, regulators, equipment suppliers are grappling with questions about their role in the emerging global communications fabric

- What services?
- Where to?
- To whom?
- How?
- With whom?

Increasing pressure to look beyond traditional services to and from traditional territories. <u>All players</u> need to look at <u>all services, globally</u>

FORECASTING TRAFFIC

Once a solid base of current international traffic patterns have been established, we can begin to forecast future flows

Today's Presentation

- Current international traffic
- Forecasting traffic
- Using the results of modelling international traffic

TODAY'S PRESENTATION

Today's presentation will seek to raise issues concerning the nature and volumes of traffic throughout the world. The presentation is divided into three sections

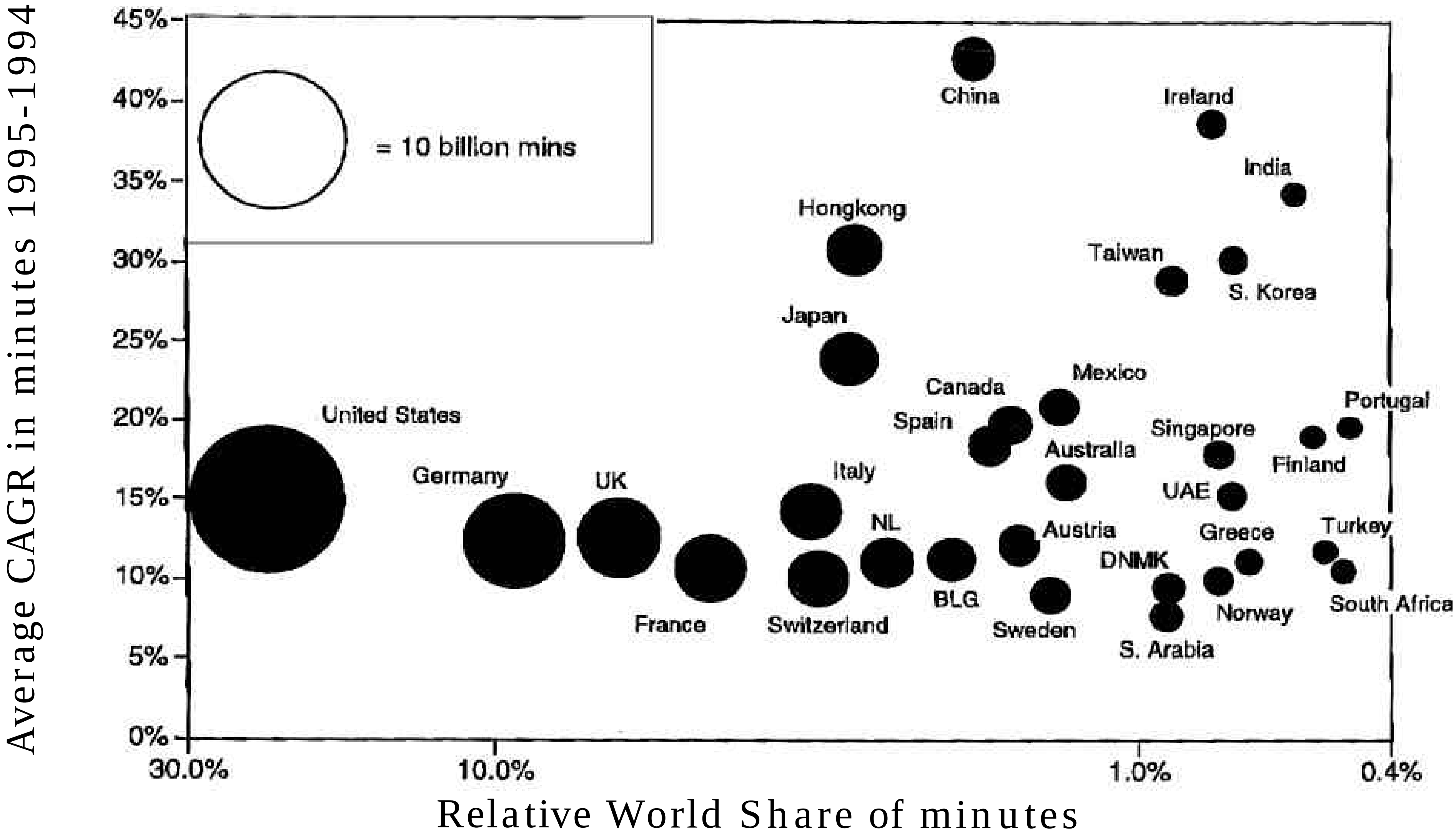
Today's Presentation

- Current international traffic
- Forecasting traffic
- Using the results of modelling international traffic

The presentation draws on CSMG's experience in conducting analysis and building forecasts of international traffic over the last eight years

CURRENT INTERNATIONAL TRAFFIC

GLOBAL OUTGOING SWITCHED TRAFFIC 1985 - 1993

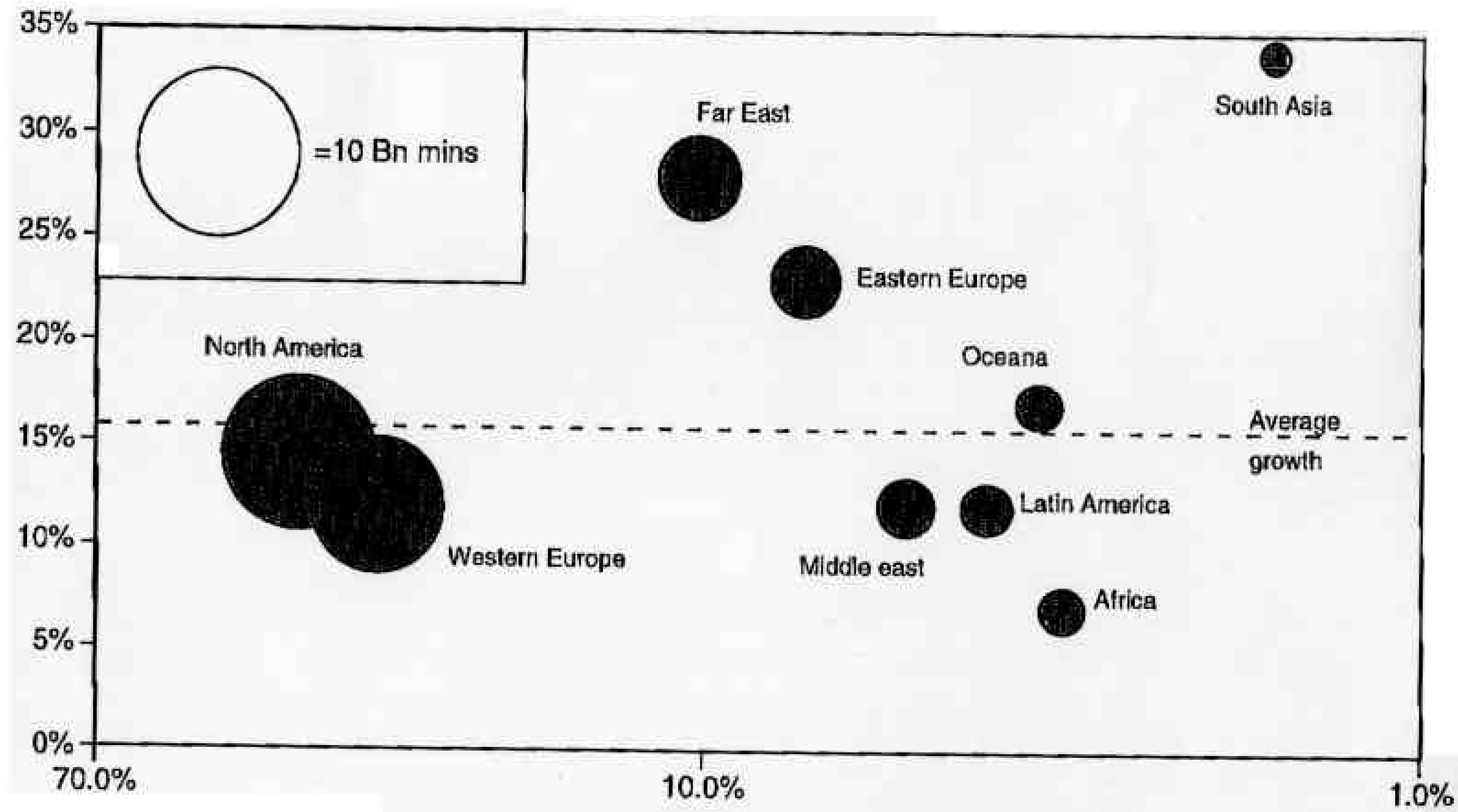


Source= ITU, CSMG analysis

CURRENT INTERNATIONAL TRAFFIC

TOTAL OUT-OF-REGION SWITCHED TRAFFIC 1985-1994

Average CAGR in minutes* 1985-1993



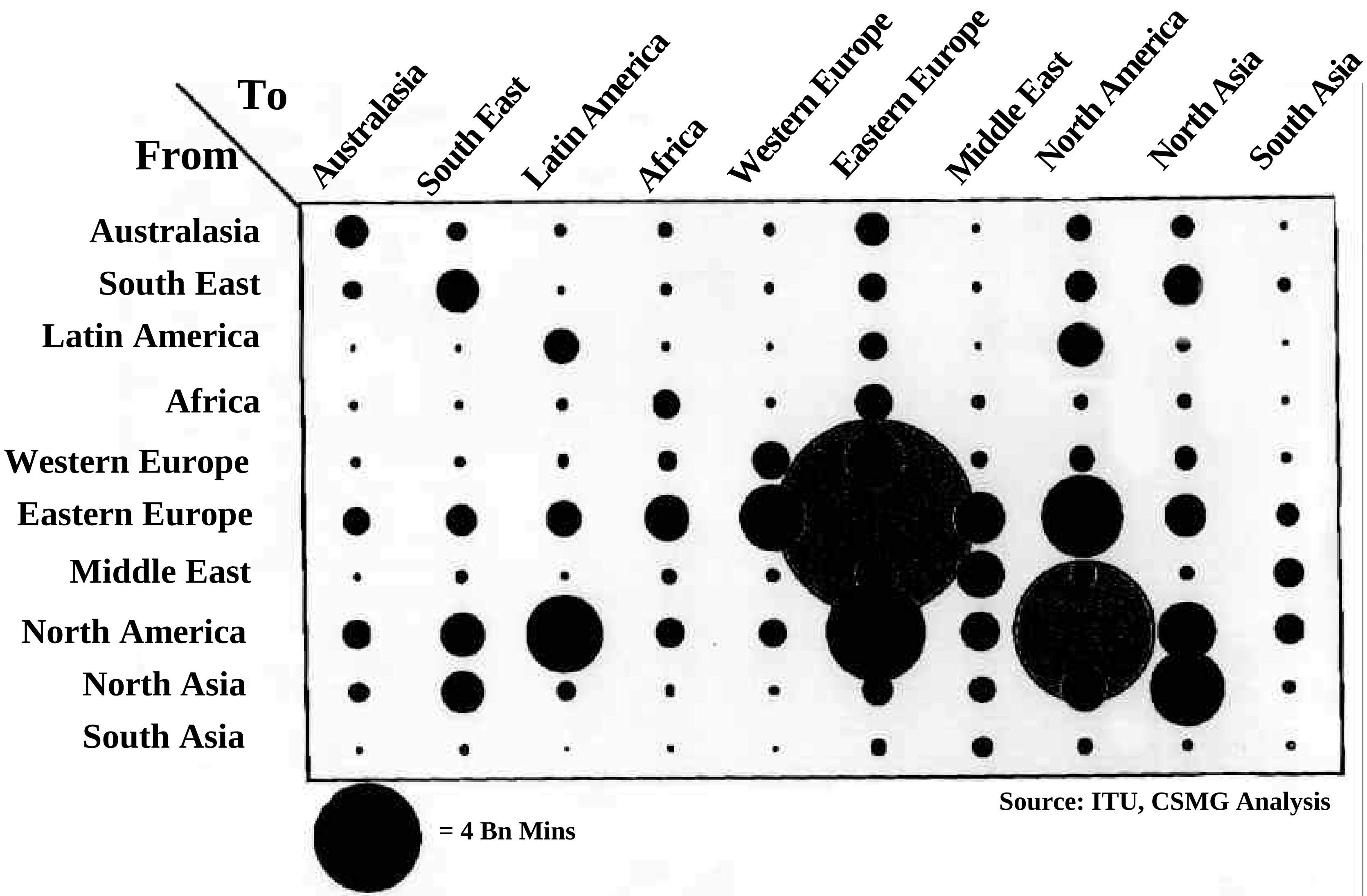
Relative World Share of minutes

Source: ITU

*Includes in -region traffic growth

CURRENT INTERNATIONAL TRAFFIC

GLOBAL OUTGOING SWITCHED TRAFFIC 1994

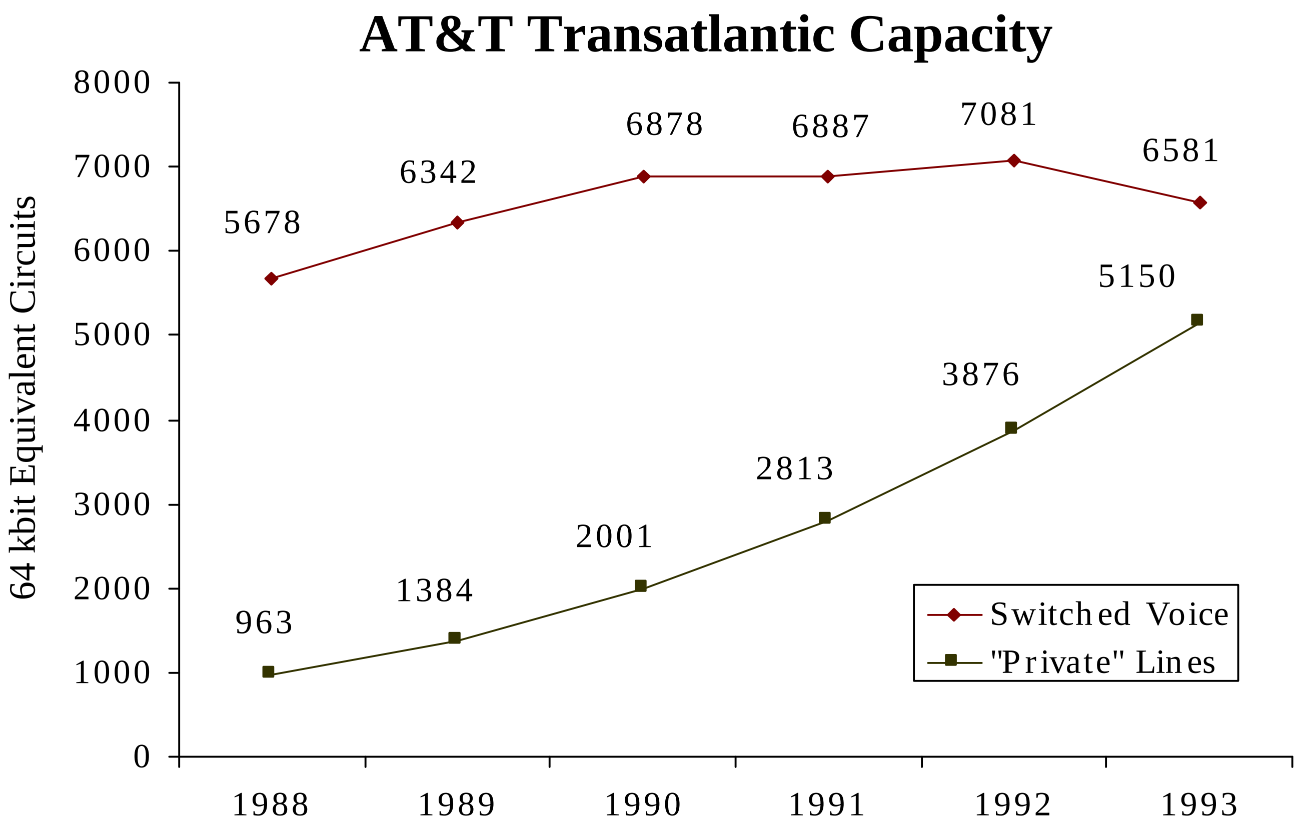


Source: ITU, CSMG Analysis

CURRENT INTERNATIONAL TRAFFIC

WHAT IS MISSING?

Given AT&T's relative market shares in private line (30%) and switched voice (70%), CSMG estimate that private circuits accounted for 65% of transatlantic capacity by 1993

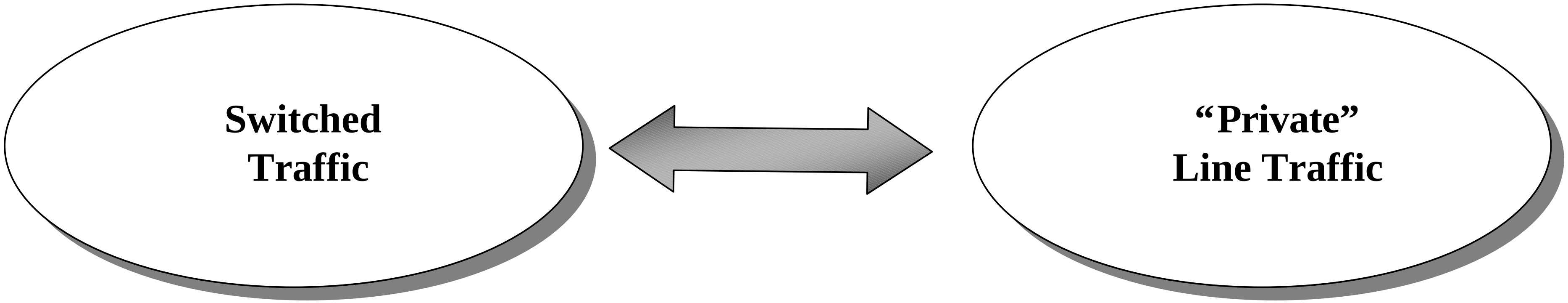


Source: FCC, Brattle Group

CURRENT INTERNATIONAL TRAFFIC

PUBLIC OR PRIVATE?

Much of the "private" line traffic is not private at all but addresses demand that is met also met by public switched services



The two groups are often close substitutes and they share similar fundamental drivers. It is therefore not possible to ignore one when considering the other

CURRENT INTERNATIONAL TRAFFIC
THE PROBLEM OF PRIVATE LINE TRAFFIC

In terms of modelling, the increasing importance of private line traffic presents us with a dilemma

- Statistical data on switched traffic is both readily available and reasonably consistent
  - Where data is missing, good estimates can be made

HOWEVER

- There is very little information on the amount of traffic being carried over private lines

The most interesting and fastest-growing segment of international telecomms is the one we know least about

CURRENT INTERNATIONAL TRAFFIC
DATA COLLECTION AND ESTIMATION FOR SWITCHED TRAFFIC

CSMG has found publicly available data on switched traffic is plentiful and once anomalies are corrected, it is fairly accurate

Albania Algeria Angola → Zimbabwe

Albania
Algeria
Angola
↓
Zimbabwe

- **A total of over 8117 country pairs filled**
- **92% of world's switched traffic allocated**

In order to allocate the remaining 8% of traffic, a set of estimates can be generated using trade, airline traffic, and GDP data

CURRENT INTERNATIONAL TRAFFIC
PRIVATE LINE TRAFFIC

With Telex and telegraphy now obsolete and only a small amount of packet switched data or video traffic, private circuits carry the bulk of traffic that is not carried over the public switched network

What is private line traffic

- Corporate networks
  - Voice/video
  - Data
- Global network services
  - Value added networks
  - Virtual private networks
  - Public on-line services
- Resale servcies
  - International simple resale
  - Single-ended resale
- Internet

CURRENT INTERNATIONAL TRAFFIC
PRIVATE LINE TRAFFIC

The best indication of traffic levels comes from international capacity dedicated to private lines

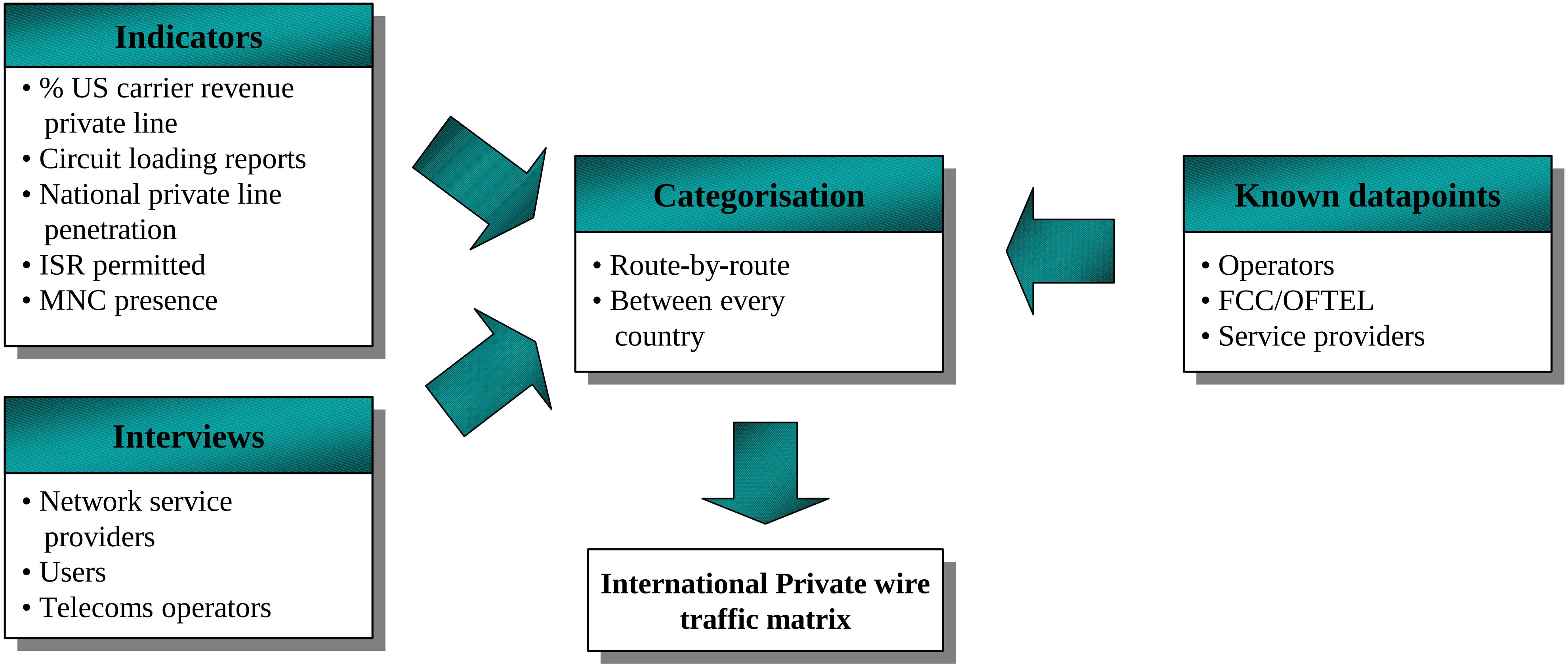
- With some notable exceptions (USA), good information on private line capacity is not readily available
  - Most operators will not tell, many do not know

FURTHERMORE

- Since many private networks (corporate networks, VANs, ISRs, IVPNs etc…) hub traffic, the number of circuits between two points is not indicative of the underlying demand for capacity between those two countries
  - Much of the traffic may originate or terminate in a third country

CURRENT INTERNATIONAL TRAFFIC
DETERMINING PRIVATE LINE TRAFFIC

CSMG's approach to estimating private line traffic focuses on leveraging as much as possible on known data points. Qualitative information and indicators are then used to complete the picture



FORECASTING TRAFFIC

Traditionally, carriers have been relatively unsophisticated in forecasting. Forecasting has mainly been for network planning and not business strategy

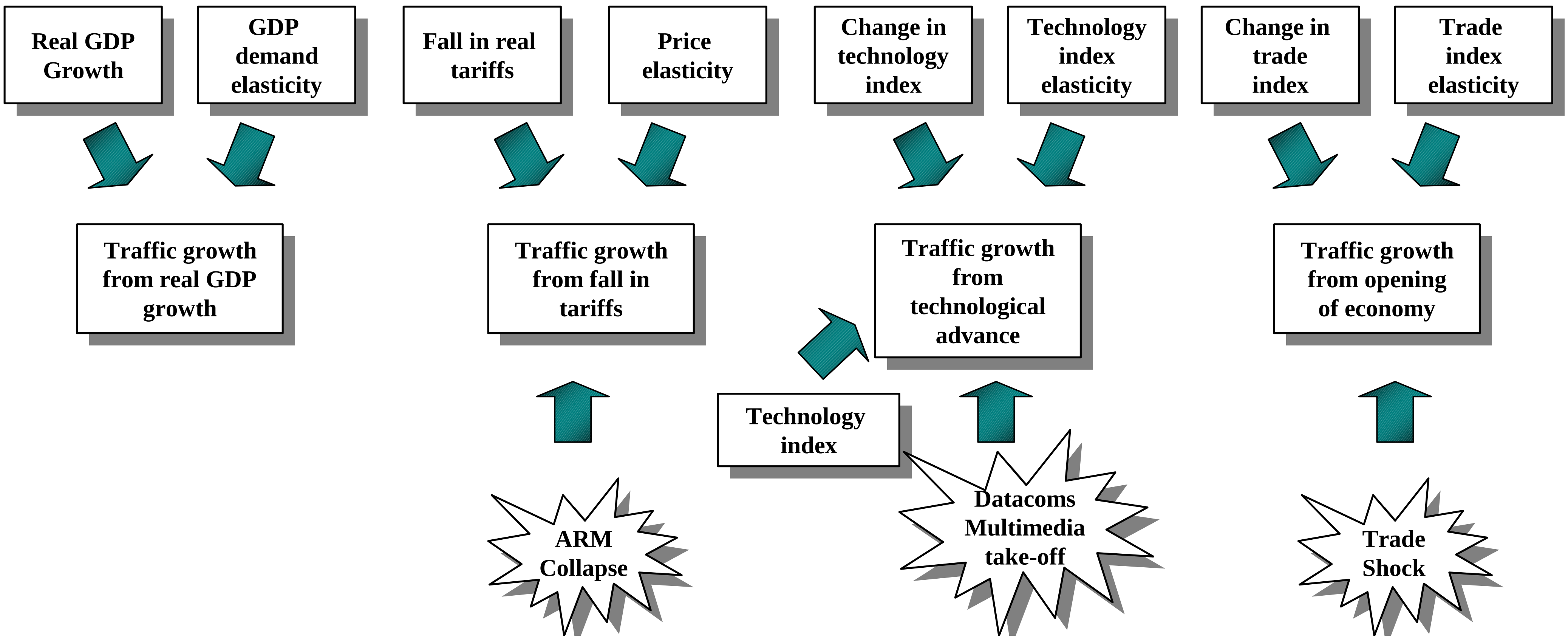
- Most common approach is to extend historic trends forwards
  - Usually set annual traffic increments to historic trends forwards
  - Implies that growth falls over time
- More developed approaches provide greater insight
  - Exponential smoothing puts greater emphasis on recent years
  - Linear regressions on Long of traffic provide constant growth forecasts

As a rule, forecasts tend to be backwards looking rather than forwards looking

- Generate ‘pessimistic’ scenarios
- Repeatedly fall short of “actuals”

FORECASTING TRAFFIC

Many forecasts do not attempt to link demand with any fundamental driver. CSMG’s approach uses four main drivers that encompass a range of smaller variables



FORECASTING TRAFFIC

DEVELOPING SCENARIOS

The approach described allows users to separate-out the effects of different sets of assumptions and more effectively 'explain' forecasts

Scenarios must be:

- Internally consistent
- Supported by external events
- Acceptable to those concerned
- Easily understood
- Easily modified by returning to original assumptions

Building scenarios requires accumulating a vast database of country specific information on expected future trends in GDP, Trade, Technology and Telecoms Regulation

USING THE RESULTS OF MODELLING INTERNATIONAL TRAFFIC

If modelling is to be anything more than an academic exercise, it must provide a valuable contribution to addressing problems

Today's Presentation

- Current international traffic
- Forecasting traffic
- Using the results of modelling international traffic

Extracting insight from modelling is often as complex as the modelling itself

USING THE RESULTS OF MODELLING INTERNATIONAL TRAFFIC

Using the methodology outlined today, CSMG has developed a model called SMITH (Simulation Model of International Telecoms Horizons). It has helped tackle a range of issues for players with a range of objectives:

- Manufacturers
- Operators
- Regulators

The following are some concrete examples on how some of our clients have used traffic modelling

USING THE RESULTS OF MODELLING INTERNATIONAL TRAFFIC

Alliance/partner strategy

- What synergies exists in terms of hubbing and co-ordinating traffic planning
- How much traffic could a new operator potentially send to me?

Cable system evaluation

- Where are the best opportunities for building new systems?
- What do we need to ensure to achieve viability?
- Landing site selection
- Pricing issues

Competitor analysis

- What would specific competitor actions mean for us?
  - Alliances
  - New systems
- How could we reduce potential threats to entering our market?

Network Planning

- Where should we build a hub?
  - Accounting rages
- What sort of capacity should we plan for?

Tactical responses

- What would a breakdown in the mechanism mean for us?
- What does a single European Market in 1998 mean for us?

Negotiations

- With potential partners
- With potential hub customers/providers
- Accounting rates
- With financial backers

COMMUNICATING FINDINGS

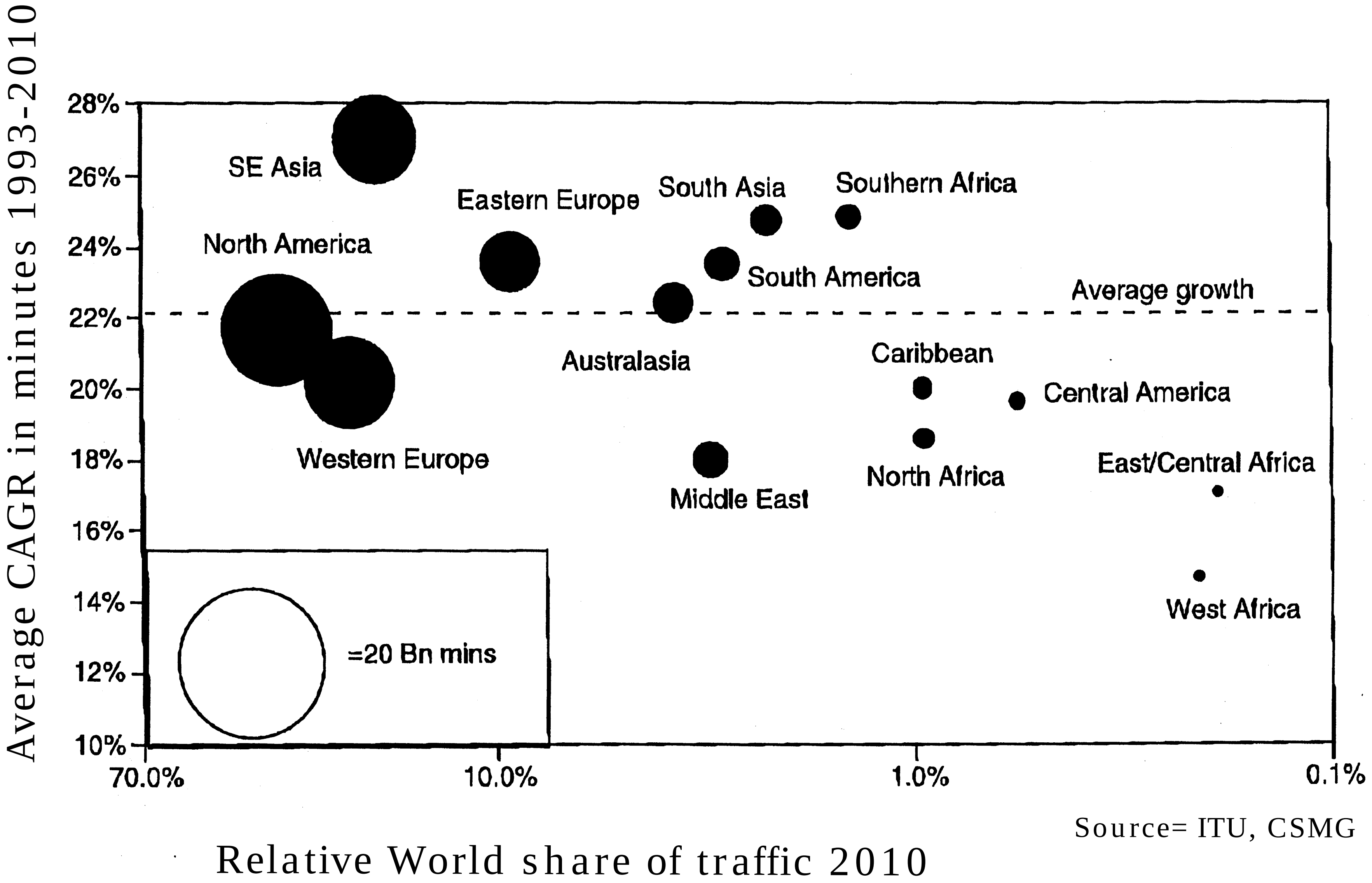
GSMG has also developed a range of powerful reporting tools that can communicate findings efficiently the

- These tools should be customised to support specific analysis and emphasise key points

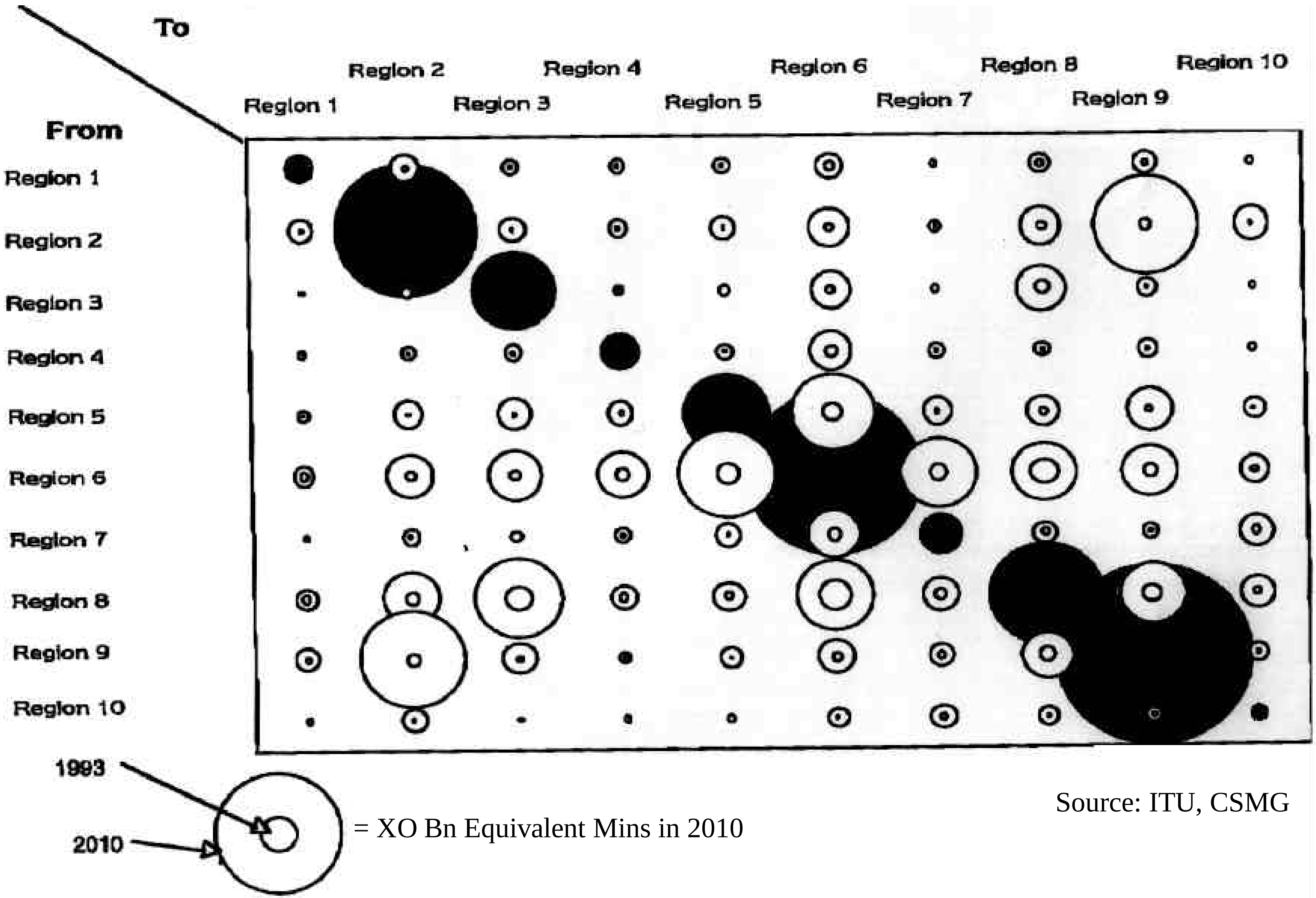
- When using traffic forecasts for strategic planning, output should prompt questions and provide insight. Lists of numbers are good for network planning but inappropriate for exploring other business issues

In our experience, traffic information is often very rich and detailled. Good graphical representations allow key findings to be communicated clearly to senior management without losing the full granularity of data

GLOBAL TRAFFIC 1993-2010



GLOBAL TRAFFIC 1993-2010



Source: ITU, CSMG

CONCLUSION

Those planning to join in the global telecoms revolution should guard against complacency or else they risk being left in the slow lane of the information superhighway

Key lessons

- **Do it all**
  - **Be <u>complete</u>**
  - **Be <u>detailled</u>**
- **Keep it simple**
- **Above all… establish your objective. Build a model that delivers answ answer analysis**

Having a good map in the jungle of global communications does not guarantee you can find your way through. But, falling to even choose a direction will get you nowhere.

S.4: Quality of Service

Tuesday
19 March

Session 4: Quality of Service

There is near unanimous agreement that quality of service indicators are important but there are methodological problems in their use for meaningful comparisons. What quality of service statistics are in use, what are their limitations and can a core set of indicators be agreed on? What about customer satisfaction indexes—do they mean anything to anyone but an operator?

"Quality of service indicators"
S. Paltridge, OECD

"Customer Satisfaction Index"
C. Almeida, TeleBras, Brazil

Workshop 1: Costructing Tariff Models

A hands-on approach covering the ingredients for making tariff comparisons.

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

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World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: OECD, Sam Paltridge

TITLE: TELECOMMUNICATION QUALITY OF SERVICE STATISTICS

Telecommunication Quality of Service Statistics

ITU World Telecommunication Indicators Meeting

Sam Paltridge

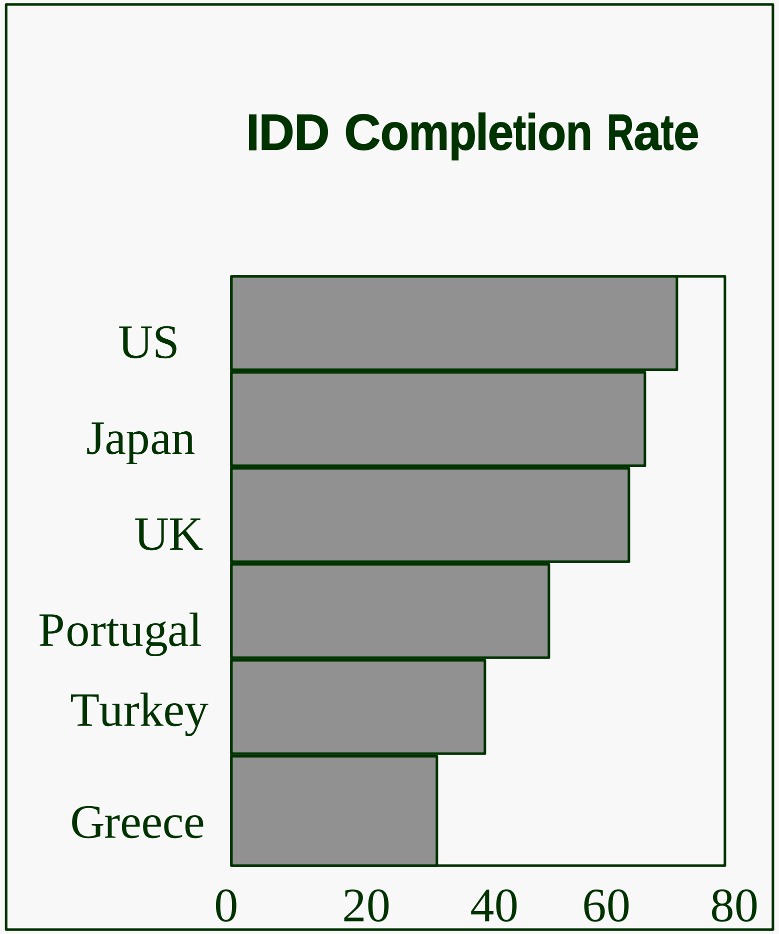
OECD

Telecom Information
http://www.oecd.org/dsi/sti_ict.html

- **Communications Outlook**
  - Regulation
  - Services market
  - Network dimensions & development
  - Telecommunication tariffs
  - Employment and productivitz
  - Trade in telecommunication equipment
  - Patents/Telecommunication Aid
  - **Quality of service (Chapter 6)**

Why Measure Quality of Service?

- Monitor and Improve Customer Service
- PTO Service Guarantees
- PTO International Benchmarking
- Inform regulatory process
  - Price Controls
  - Cosumer Complaints
- Comparative Policy Analysis



Who Measures Quality of Service?

- PTOs
  - » Routine Network and Business Reporting
  - » Customer satisfaction/retention surveys
- Independent surveys
  - » Regulators
  - » Customers (e.g. INTUG)
  - » Other PTOs
  - » Network surveys (e.g. Internet)

Examples of What PTOs Collect (BT)

- Overall Customer Satisfaction
- Network Performance
  - » first time call connection
  - » call failure rate
  - » customer reported faults
- Requests for Service Assumptions
  - » completion by agreed date (bus. & res.)
- Repair of Service
  - » fault clearance

Examples of PTO Indicators (BT)

- Operator Services
  - » Operator response time
- Public Payphones
  - » Number of Payphones
  - » Average number in working order
- Private Leased Circuits
  - » Installations by contracted date
  - » Faults per circuit
  - » Fault per clearance

Other Indicators PTOs Publish/Detail

- Service Provision
  - » Network coverage
  - » New/In place connections
- Call Completion by Type and Time of Day
  - » Local, Long Distance, International, Mobile.
  - » By area (e.g. Urban/Rural or CBD)
  - » Busy Hours, Day/Night.

Indicators PTOs Publish/Detail

- Fault Clearance and Location
  - » By number of days, working days, hours
  - » Missed days beyond appointment.
  - » Trouble reports
    - – actual faults found.
    - – Trouble reports found OK (e.g. CPE problem)
    - – repeat trouble reports
  - » Switches with downtime/Trunk Blocking
    - – number of switches with downtime & average downtime
    - – percentage of trunk groups exceeding objective for blocking

Indicators PTOs Publish/Detail

- Customer Access
  - » Directory Assistance Calls entering the network and being answered within 10 seconds
  - » Calls entering Directory Assistance queue and not being answered
  - » Calls entering service difficulties queue and being answered within 15 seconds.
  - » Calls entering service difficulties queue and leaving without being answered

Indicators PTOs Publish/Detail

- Complaints or Inquiries?
  - » Total Complaints
  - » Satisfaction with Complaint Handling
  - » Service/Activity Specific Complaints
    - – Billing
    - – Service Restoration
    - – Other (e.g. Staff, Advertising)
  - » Reporting Measures
    - – Per Customer Bill (e.g. 1000)
    - – % of Total
    - – Written

Quality of Service Indicators Collected by OECD

- Waiting time
- Outstanding Connections
- Network Coverage
- Call Completion
- Faults/Repair time
- Payphones
- Customers with Itemised bills
- Availability of New Services and Price

Concluding Points

- Quality of Service indicators are vital irrespective of market structure
- Hamonise key Indicators in accord with ITU handbook definitions
- Importance of time series
- Appropriate regulatory powers to request information (needs will change over time)
- Regulatory publish key indicators

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

Document WTIM96/27-E
19 March, 1996
Original: English

World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: TELEBRAS, Cleverson Pereira de Almeida

TITLE: CUSTOMER SATISFACTION MEASUREMENT

WORLD TELECOMMUNICATION INDICATORS MEETING

GENEVA, 19 - 21 MARCH 1996

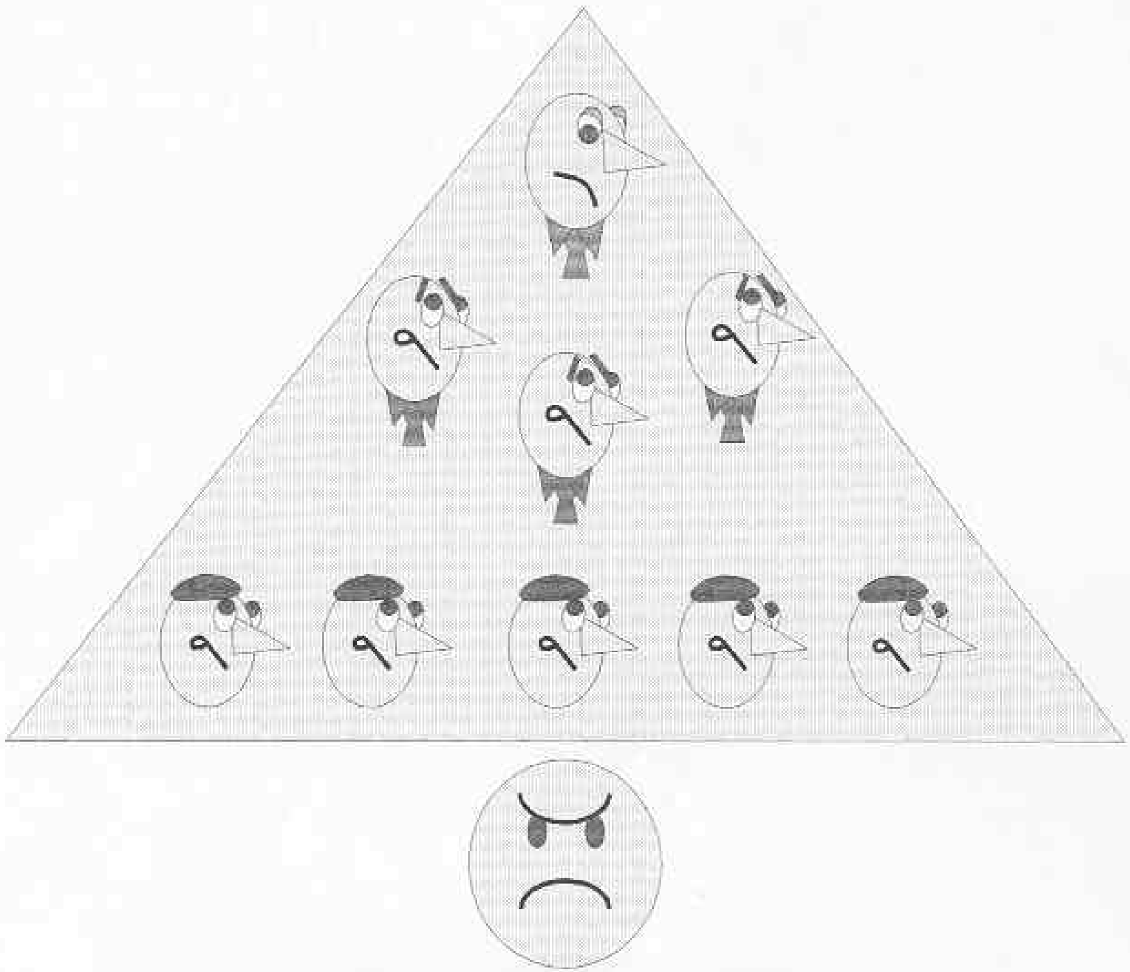
CUSTOMER SATISFACTION MEASUREMENT

CLEVERSON PEREIRA DE ALMEIDA

Statistician

Marketing Management Department

TELEBRÁS



CUSTOMER

ISO 9004, item 0.1

In order to be successful, and organization should offer products that:

a) meet a well-defined need, use or purpose
b) satisfy customer’s expectations
c) comply with applicable stands and specifications
d) comply with requirements of society
e) reflect environmental need
f) are made available at competitive prices
g) are provided economically.

ISO 9004, part 2, 6:3:3

Service organizations should institute an ongoing assessment and measurement of customer satisfaction. These assessment should seek positive as well as negative reactions and their likely effect on future business.

SATISFACTION

The psychological concept which expresses better than any other the adjustment of our actions to the expectations of the client is the one called satisfaction. We say that there is satisfaction when a working action or the functioning of a service is at the level of the desires of the client, of what he was waiting for, obtaining as effect a gratifying sensation or at least the lack of tension.

(José Rial Avendaño, Enrique Carreras and Marina de Jaén Sanchez, in "The Measurement of Quality of the Telephone Services in Spain: Customer Satisfaction")

HISTORICAL BACKGROUND (1)

1983 - First Studies
(GTE experience: TELECEL - Customer Expectation Level)

1984 - First Survey: Telephone Use and Service
- 10 major state capitals
- only residential survey
- telephone interviews

1985 and 1986 -
- all state capitals (26 cities) and two restricted interior areas
- annual surveys

from 1987 to 1990
- capitals and interior (200 customers interviewed in each operation subsidiary area)

1988 - subsidiary companies begin to process their own surveys using SELAP software.

HISTORICAL BACKGROUND (2)

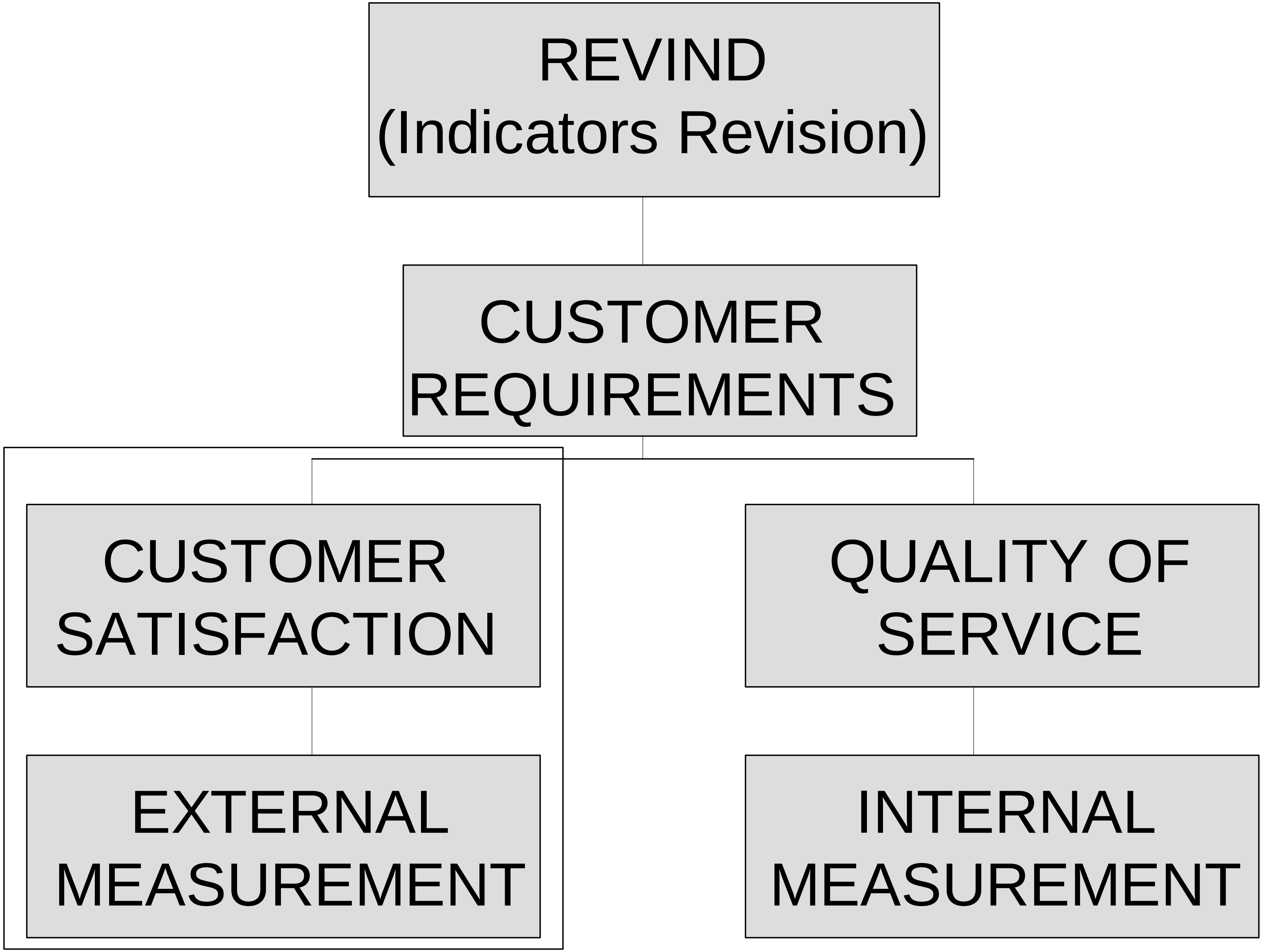
1991 - REVISION

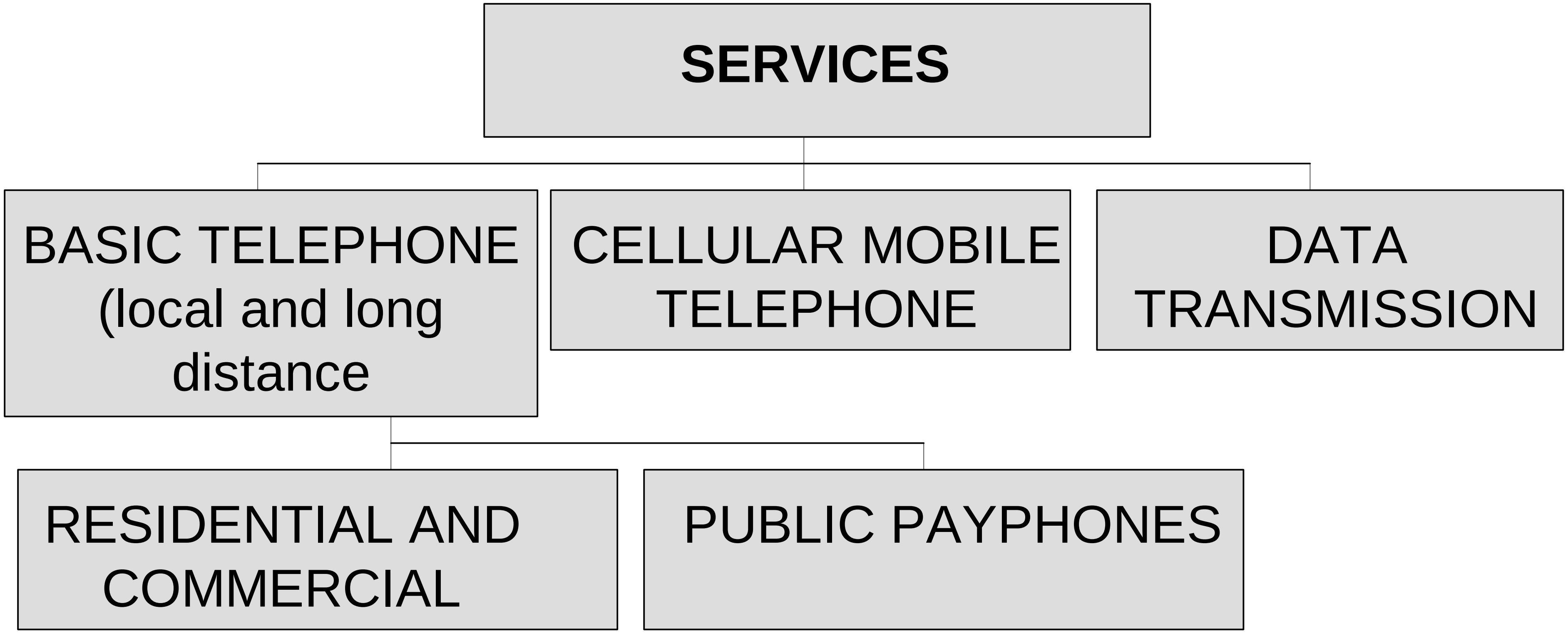
- residential and commercial segments
- daily use, technical assistance and attendance surveys
- inclusion of public payphones
- semestral surveys
- 89 operating areas
- more than 50.000 customers interviewed each semester (by phone)
- weighted survey (personal interviews)

1995 - REVIND

- previous qualitative research (customer requirements)
- inclusion of two specific surveys: data transmission and public payphones
- quarterly surveys
- only proportions as satisfaction indicators

1996 - New surveys and set of satisfaction indicators


REVIND
(Indicators Revision)
CUSTOMER REQUIREMENTS
CUSTOMER SATISFACTION
QUALITY OF SERVICE
EXTERNAL MEASUREMENT
INTERNAL MEASUREMENT


SERVICES
BASIC TELEPHONE (local and long distance
CELLULAR MOBILE TELEPHONE
DATA TRANSMISSION
RESIDENTIAL AND COMMERCIAL
PUBLIC PAYPHONES

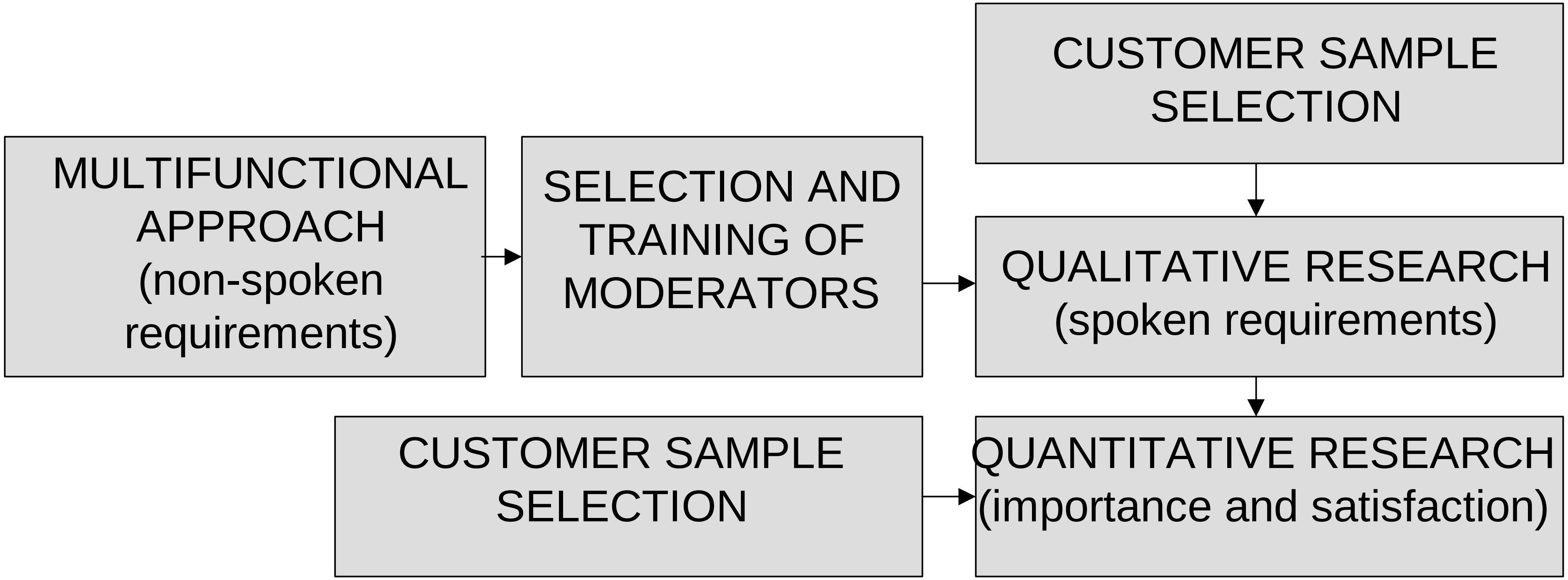
QUALITY DIMENSION

The purpose of determining customer requirements is to establish a comprehensive list of al! the important quality dimensions that describe the service or product. It is important to understand the quality dimensions so that you will know how customers define quality of your service or product. Only by understanding the quality dimensions will you be able to develop measures to assess these quality dimensions.

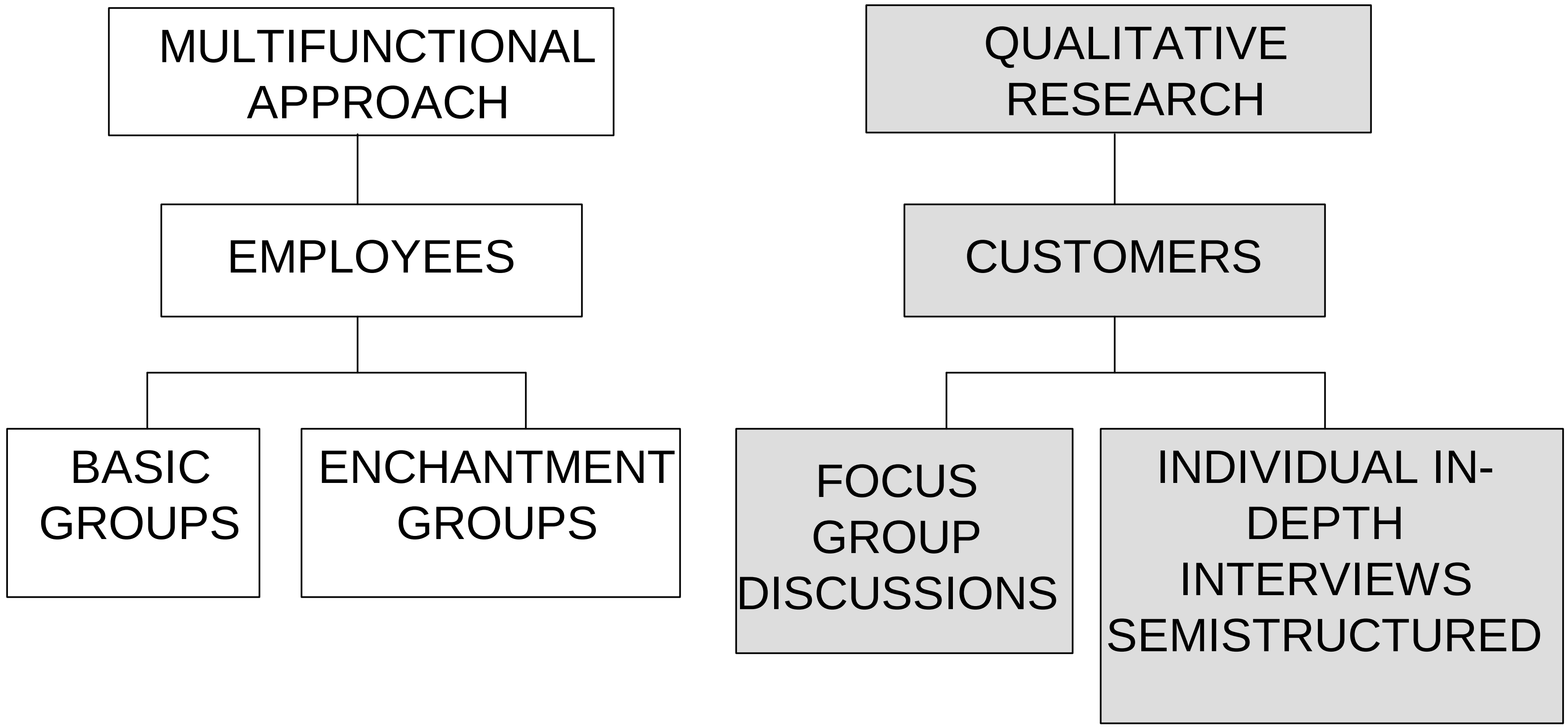
(Bob E. Hayes, in "Measuring Customer Satisfaction

- Development and Use of Questionnaires")

OBTAINING CUSTOMER REQUIREMENTS



GENERATING CRITICAL INCIDENTS



CRITICAL INCIDENT

A critical incident is a specific example of the service or product that describes either positive or negative performance. A good critical incident for defining customer requirements has two characteristics:

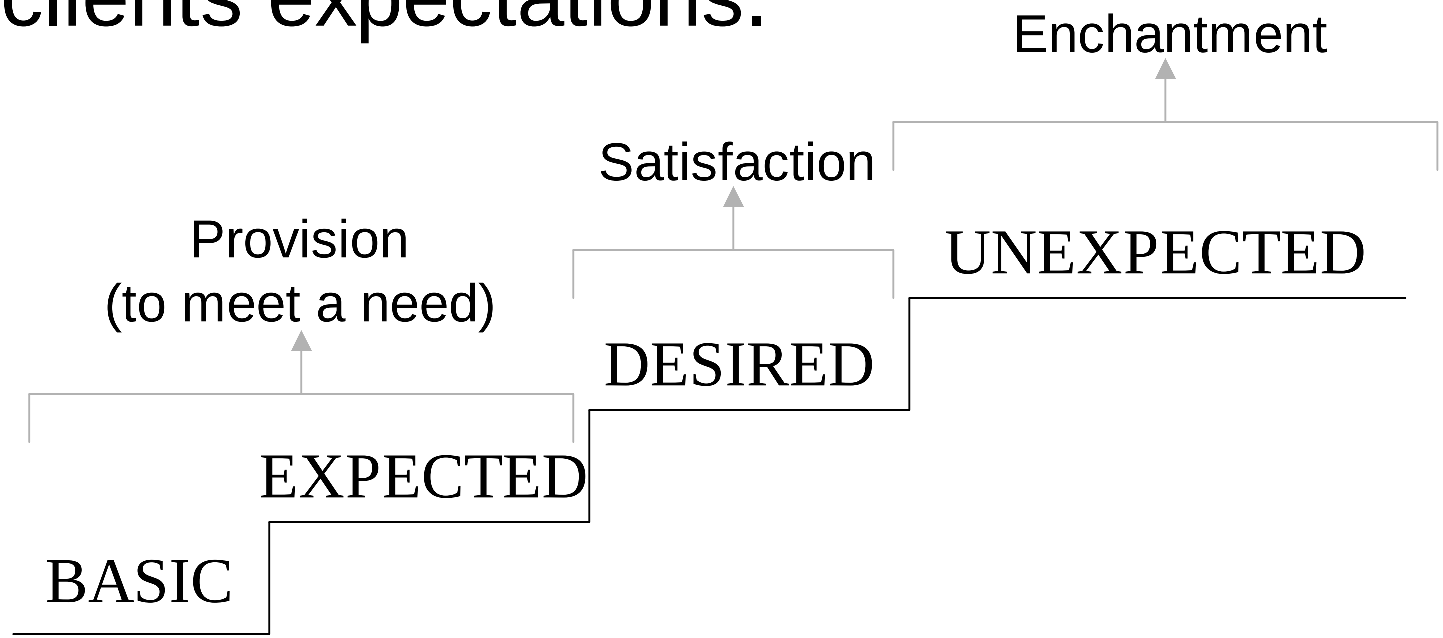
1) it is specific,

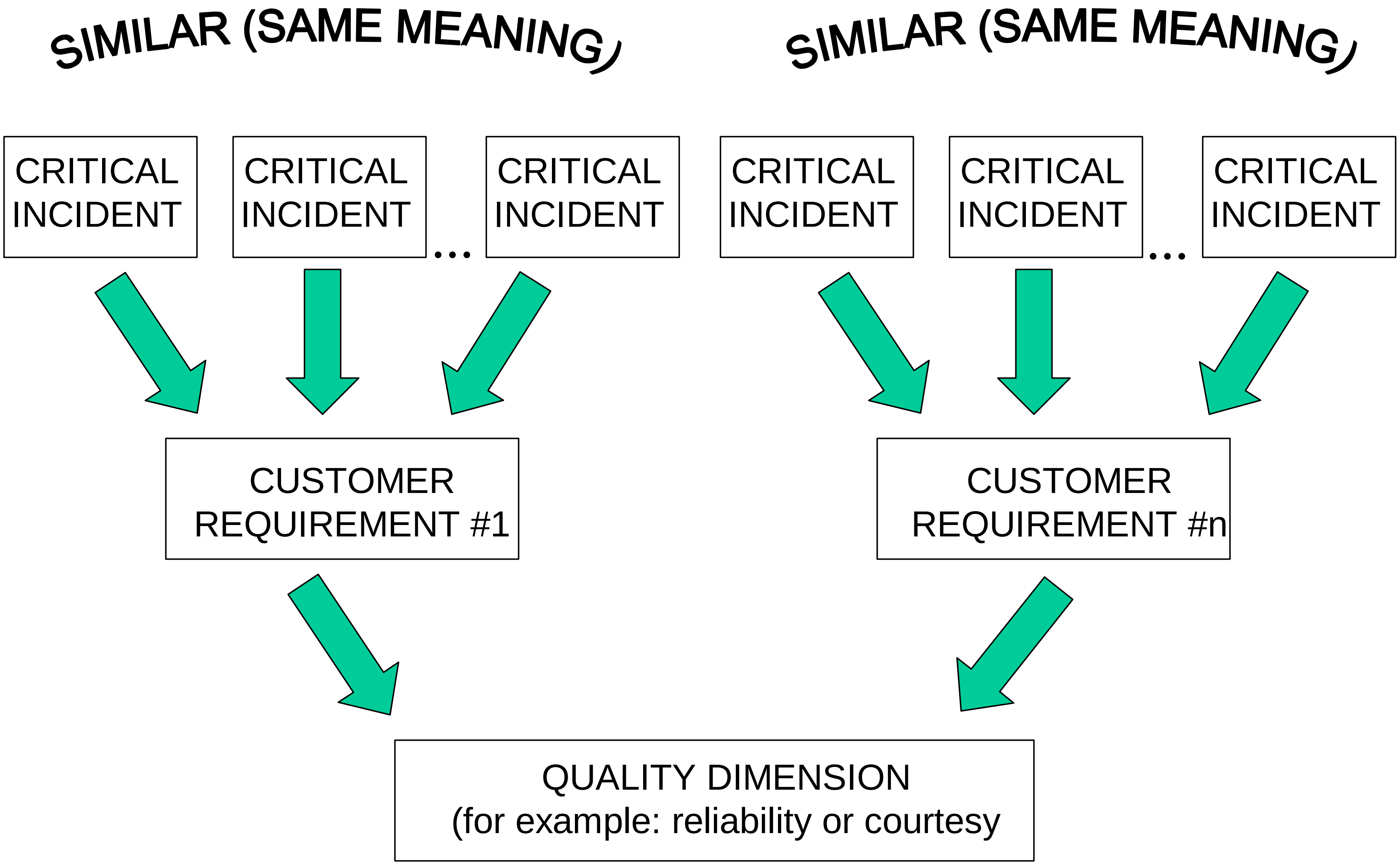
2) it describes the service provider in behavioral terms or describers the service or product with specific adjectives

(Bob E. Hayes)

ENCHANTMENT GROUPS

These groups of employees seek something different, special, creative that can improve our services and surpass our clients expectations.





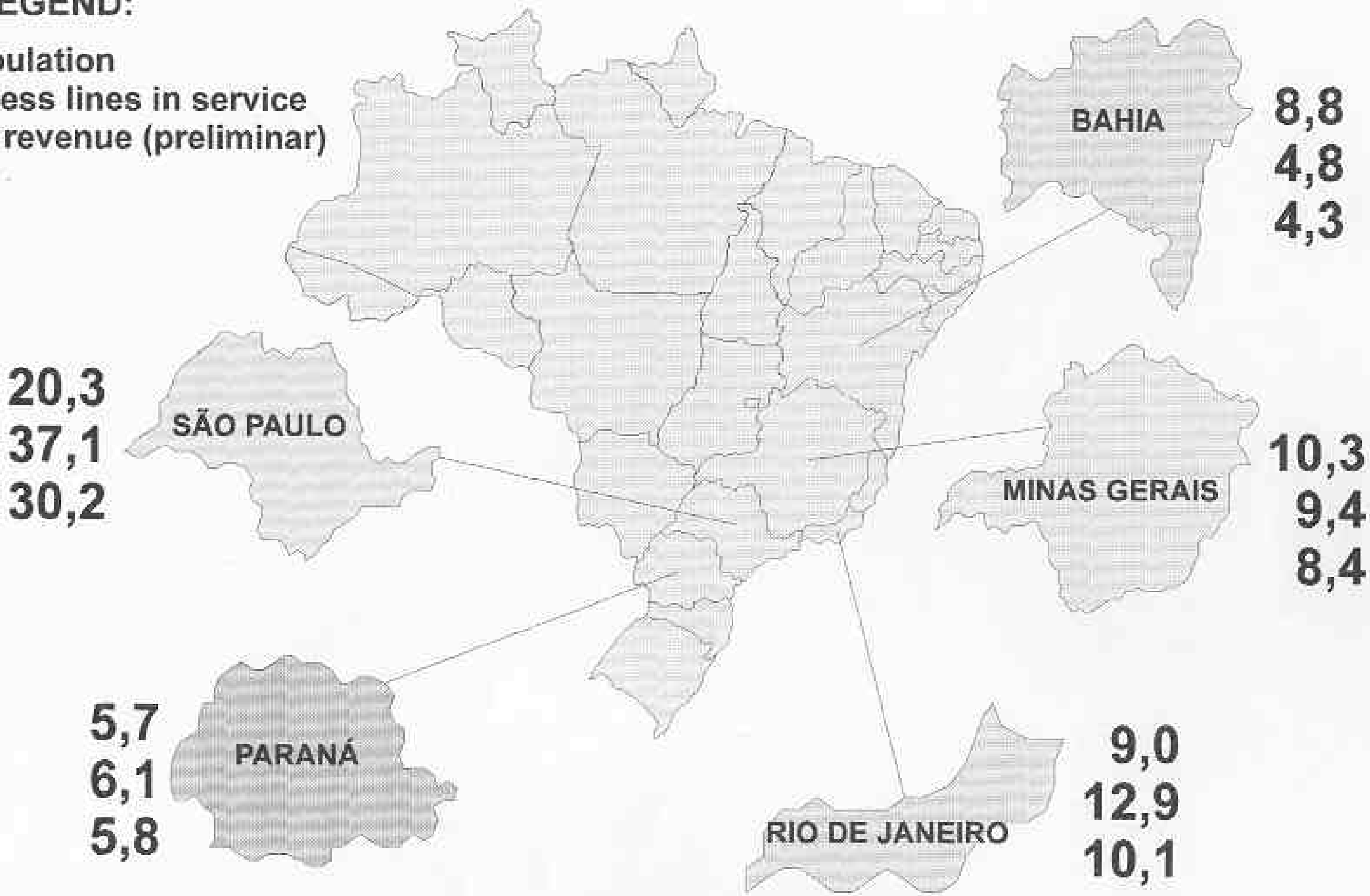
SIMILAR (SAME MEANING)
SIMILAR (SAME MEANING)
CRITICAL INCIDENT
CRITICAL INCIDENT
...
CRITICAL INCIDENT
CRITICAL INCIDENT
CRITICAL INCIDENT
...
CRITICAL INCIDENT
CUSTOMER REQUIREMENT #1
CUSTOMER REQUIREMENT #n
QUALITY DIMENSION
(for example: reliability or courtesy

TELEBRÁS

BRAZIL

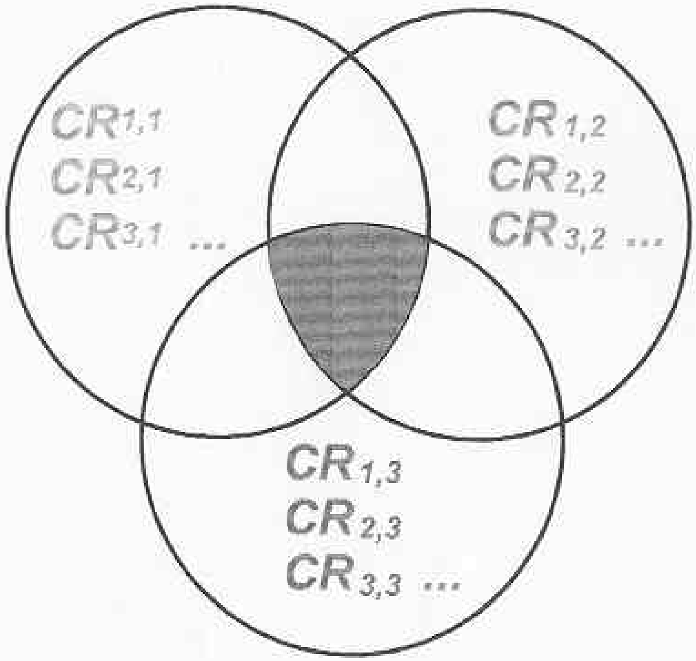
LEGEND:

% population
% access lines in service
% net revenue (preliminar)



TELEBRÁS

INDICATORS FOR TELEBRÁS (HOLDING) MANAGEMENT, SERVICE "S"



$CR_{i,j}$: customer requirement i
obtained by operating subsidiary j

SCALE (for satisfaction questions)

5 - Very satisfied

4 - (Satisfied)

3 - (Neither satisfied nor dissatisfied)

2 - (Dissatisfied)

1 - Very dissatisfied

When we ask these questions, we ask a score from 1 to 5 explaining the meaning of these two limit scores.

SOFTWARE:

SELAP

Opinion Surveys Monitoring System

Supervisor: José Ronaldo Avelar

E-mail: ronaldo@sede.telebras.gov.br

GLOBAL INDICATOR

STC01: Proportion of customers satisfied with Telecom services.

Notes:

(a) for this indicator the same question is used for all different surveys;

(b) this proportion includes only scores 5 and 4 of the scale

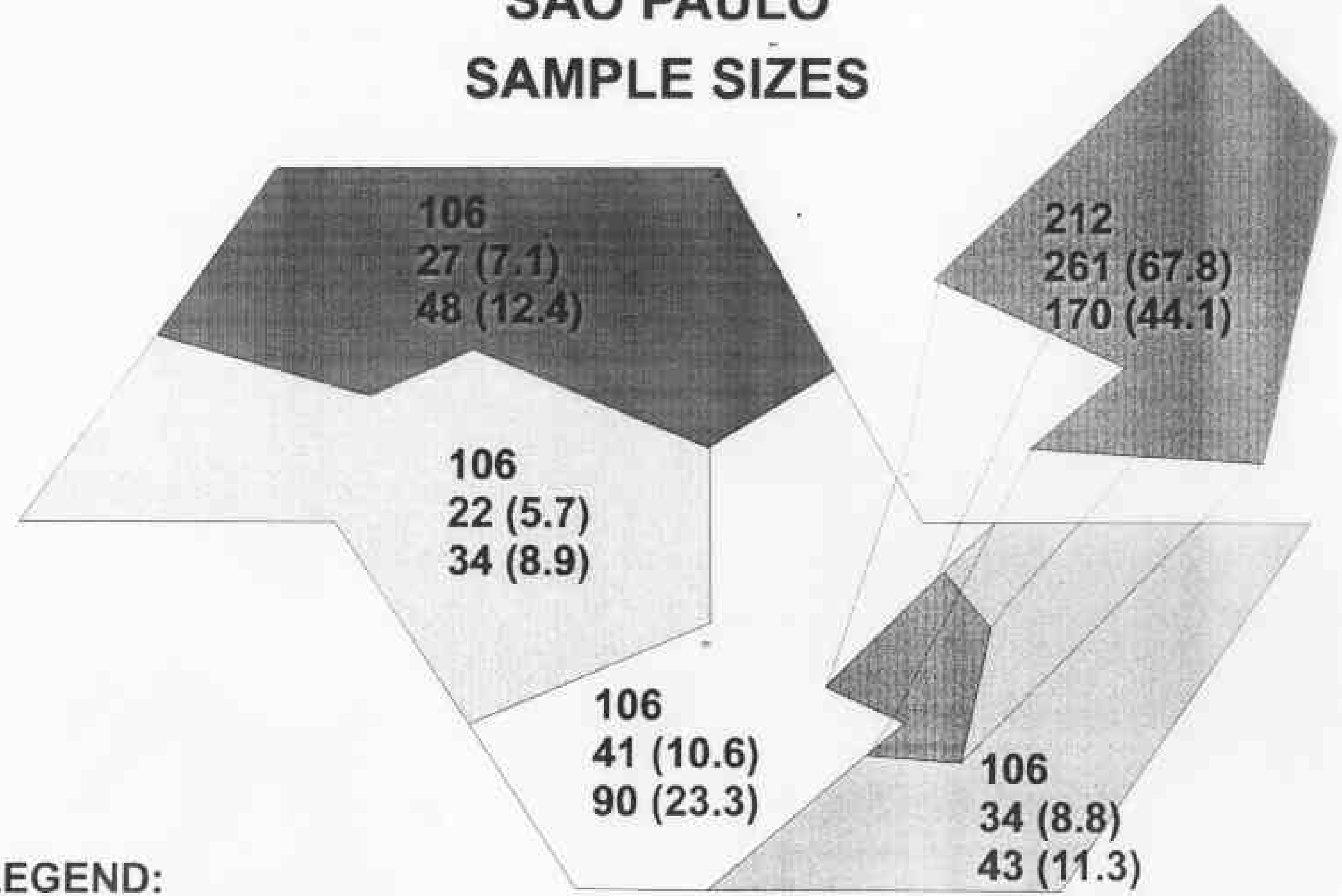
SYNTHESIS

SAMPLING PROCEDURE: STRATIFIED SAMPLING

SURVEY	METHODS OF DATA COLLECTION	RELIABILITY AND SAMPLING ERROR (PRECISION)	SAMPLE SIZE	SATISFACTION INDICATORS	PERIODS
PHONE ATTENDANCE PERSONAL ATTENDANCE TECHNICAL ASSISTANCE DAILY USE + PHONE ATTENDANCE	**TELEPHONE (or personal, for personal attendance)**	**85% 7%**	**106 (OPERATING AREA)**	**2 2 3 8**	**FEB, MAY AUG, NOV MAY, NOV**
CELLULAR MOBILE	TELEPHONE	95% 5%	385 (SUBSIDIARY)	11	APR, OCT
DATA TRANSMISSION	PERSONAL	?	?	?	APR. OCT

TELEBRÁS

SÃO PAULO
SAMPLE SIZES



LEGEND:
- BASIC TELEPHONE
- CELLULAR MOBILE (% CELLULAR LINES)
- PUBLIC PAYPHONES (% POPULATION)

INDICATORS FOR RESIDENTIAL AND COMMERCIAL TELEPHONE SERVICES (1)

(A) Proportion of customers satisfied with…

1) the time between the request for service and the service;

2) the waiting time to be attended;

3) the quality of services provided on the field;

4) personal attention given by technician;

5) personal attention during phone attendance;

6) personal attention during personal attendance (in company offices);

7) different facilities/options offered to pay the bill;

8) the level/degree of information about services offered by the company;

INDICATORS FOR RESIDENTIAL AND COMMERCIAL TELEPHONE SERVICES (1)

(B) Proportion of customers dissatisfied with…

9) non-completion of calls;

10) the number of calls cut-off;

(C) Proportion of customers who allege…

11) billing errors;

12) that the bill arrived late;

13) difficulties in understanding the bill;

(D) Proportion of...

14) demand satisfaction

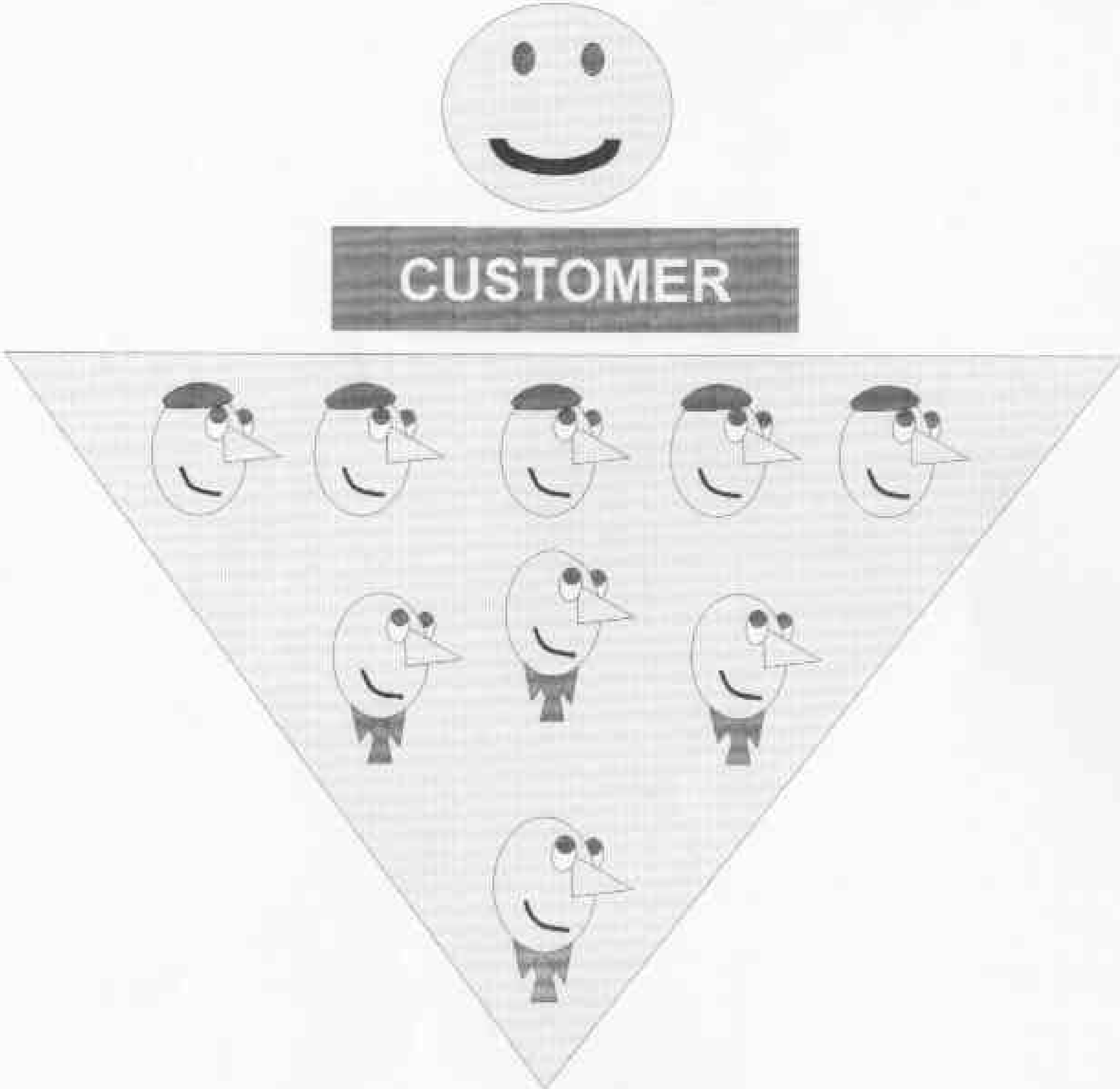
AUDITING

Objective: Certification of Indicators Reliability

Main steps:

- Checking of obtaining processes
- Checking of measurement systems
- Corrective actions

TELEBRÁS



Session 5: Collecting Statistics

Tips and experiences in defining and collecting telecommunication statistics. The problems of arriving at harmonised definitions and aggregating data. Addressing confidentiality concerns.

“Telecommunication Market Report”
M. Duckworth, OFTEL (UK)

“Quaterly Market Report”
R. Martinez, SCT, Mexico

“Regional statistics”
V. Sivoraksha, Regional Commonwealth for Communications, Russia

“African telecommunication observatory”
G. Zongo, ATO, Senegal

S.5: Collecting Statistics

Wednesday
20 March

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

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Document WTIM96/10-E
18 March, 1996
Original: English

World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: OFTEL (UK), Martin Duckworth

TITLE: TELECOMMUNICATION MARKET REPORT

UK TELECOMS LIBERALIZATION - KEY DATES

1981 British Telecom (BT) created

1984 BT privatized. OFTEL set up.

1985 Two cellular operators started.

1986 Mercury (MCL) begins competing with BT.

1991 Duopoly review proposes increased competition.

1992 Cable TV operators offer telephony.

1993 Third cellular operator

1994 Number of fixed link operators start up

Fourth cellular operator

USES OF THE MARKET DATA - OFTEL AND OUTSIDE

Monitoring network competition

Monitoring service competition

Assessing whether operators are dominant for anti competition investigations

Implementing parts of licences which require market share information

Improving the efficiency of the market through more accurate information

DATA COLLECTED - FIXED OPERATORS

Retail Call Revenues
Retail call volumes (minutes)
Interconnect revenues
Interconnect volumes
Enhanced PSTN services (centrex/VPN, Freephone etc., Charge cards)
Exchange line numbers
Exchange Line revenues
Payphones
Leased Lines
Telex

DATA COLLECTED - CELLULAR NETWORK OPERATORS

Number of subscribers
Rental revenues
Connections & disconnections
Connection revenue
Call revenues
Call Volumes
Interconnect revenues
Interconnect volumes

DATA COLLECTION METHODS

Paper forms used for collection

Input onto FoxPro database within OFTEL

Rely heavily on operators co-operation

Operators can be ordered to supply information

Quarterly (every 3 months) cycle:

2 months after end of period	Forms sent to operators
4 months after end of period	Completed forms returned
6 months after end of period	publication released

PUBLICATION - CONFIDENTIALITY ISSUES

Director General has wide powers to publish data

Operators do not want data published

Operator level data only published on larger/established operators

Only a subset of data is published for any operator

Unpublished data not released outside OFTEL.

PUBLICATIONS - ANNUAL VS QUARTERLY

Annual Publication

Aimed at broad range of users
Covers the total market
"Glossy" publication
Comprehensive notes

Quarterly publication

Aimed at telecoms analysts
Coverage limited to the areas of the market of most interest
Produced quickly and cheaply
Concentrates growth in competition and growth in total market

REVIEW OF DATA COLLECTION

Need to balance needs of users with resources within OFTEL and the operators

Three inputs to decisions

Consultation with operators
Consultation with users within OFTEL
Own experience of collecting data

Results

In less important areas could reduce the frequency from quarterly to annual
Notes and definitions need improving
In some areas may need more detail
Problems with leased lines & interconnect data

DATA FOR GEOGRAPHIC AREAS

"UK market" increasingly becoming a number of geographic markets

OFTEL has a duty to ensure the benefits of competitions are spread fairly

Proposing to collect information on access market (exchange lines)

Divide the country using postcodes
Collect the number of exchange lines each area

COLLECTION OF DATA ON ENHANCED SERVICES

Any service other than basic transmission (data or voice)

- VPN/Centrex
- Content provision - on-line databases, information lines
- enhanced PSTN services
- etc.

Attempted data collection building on existing methods with mixed results

Increasing interest from regulatory perspective

Starting a second round of data collection

PROBLEMS COLLECTING DATA ON ENHANCED SERVICES

Large range of services offered

New services emerging

Blurring of boundaries between IT and telecoms (convergence)

Large number of service providers

No register of service providers

SETTING UP DATA COLLECTION - LESSONS

Get clear user requirements

Understand the market and the operators

Consult with operators at an early stage

Find out what data the operators have

Make sure the requirements are clear and unambiguous

Be prepared to be flexible with newer operators

Co-operate where possible/ use legal powers when necessary

INTERNATIONAL TELECOMMUNICATION UNION

**TELECOMMUNICATION
DEVELOPMENT BUREAU**

INFORMATION SYSTEMS UNIT

**Document WTIM96/17-E
18 March, 1996
Original: English**

**World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)**

SOURCE: SCT (Mex), Roberto Martínez Illescas

TITLE: QUARTERLY TELECOMMUNICATION REPORT: A STRATEGIC APPROACH TO FOSTER COMPETITION THROUGH TRANSPARENCY

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Secretaría de Comunicaciones y Transportes

QUARTERLY TELECOMMUNICATIONS REPORT:

A Strategic Approach to Foster Competition Through Transparency

Mach 1995.

Subsecretaría de Comunicaciones y Desarrollo Tecnológico

- **MEXICO HAS THE 17th LARGEST TELEPHONE NETWORK (IN TERMS OF SUBSCRIBERS) AND IS TENTH IN TERMS OF TURNOVER**

- **TELECOMMUNICATIONS IN MEXICO HAS BEEN GROWING MUCH FASTER THAN THE ECONOMY AS A WHOLE.**

- **IN 1994 TELECOMMUNICATIONS REACHED 2.5% OF MEXICAN GNP.**

TELMEX HAS BEEN THE MAIN ECONOMIC AGENT IN THE INDUSTRY AND HAS BEEN RESPONSIBLE FOR AN EXTENSIVE PROGRAMME OF GROWTH AND TECHNOLOGICAL MODERNIZATION OF THE PUBLIC TELECOMMUNICATIONS NETWORK.

- SINCE 1990, THE NUMBER OF LINES IN SERVICE HAS GROWN MORE THAN 12% ANNUALLY.
- SINCE PRIVATIZATION TELMEX HAS INVESTED AROUND 10 BILLION DOLLARS.
- IN THE LAST FIVE YEARS TELMEX HAS INSTALLED NEARLY HALF OF THE EXISTING TELEPHONE LINES.
- THE DIGITALIZATION HAS REACHED 83% OF THE NETWORK
- THE LONG DISTANCE NETWORK HAS OVER 30,000 KILOMETERS OF FIBER OPTICS CABLE.

- CELLULAR TELEPHONY IS AVAILABLE IN 160 CITIES IN THE COUNTRY.
- THERE ARE MORE THAN 660,000 SUBSCRIBERS.
- SINCE 1990, TERMINAL EQUIPMENT AND VALUE ADDED SERVICES MARKETS HAVE BEEN DEREGULATED.

HOWEVER, AS NEW OPERATORS AND SERVICES ARE ABOUT TO ENTER THE MEXICAN TELECOM SECTOR, EFFECTIVE COMPETITION WILL BECOME INCREASINGLY DEPENDENT UPON TRASNPARENCY IN THE FLOW OF BOTH REGULATORY AND STRATEGIC MARKET INFORMATION .

NEW COMPETITION AND TECHNOLOGICAL CHANGE ARE TO MODIFY DRAMATICALLY THE ORIENTATION, CONTENT AND FORMAT OF KEY STATISTICAL, REGULATORY AND ECONOMIC INFORMATION ON THE PERFORMANCE OF EVER MORE DIVERSE TELECOMMUNICATIONS MARKETS.

TELECOMMUNICATIONS POLICY SHOULD RECOGNISE THAT THERE ARE IMPORTANT ASYMMETRIES AMONGST ECONOMIC PLAYERS IN TERMS OF ACCES TO KEY INFORMATION ON:

- THE STATE OF INFRASTRUCTURE
- THE PENETRATION AND QUALITY OF SERVICES
- PATTERNS OF INVESTMENT IN TELECOMM MARKETS
- THE EVOLUTION OF TARIFFS.

IN VIEW OF THIS, GOVERNMENT HAS TO PLAY A DETERMINANT ROLE AS PRO-COMPETITION AGENT BY SERVING AS AN INFORMATION CLEARINGHOUSE TO ALL THOSE WHO MAY BENEFIT FROM THE REGULAR AND TIMELY EVALUATION OF PERFORMANCE IN PRESENT AND FUTURE TELECOMMUNICATIONS MARKETS

TO INCORPORATE THESE POLICY GOALS, THE MEXICAN GOVERNMENT, IN THE SPIRIT OF A NEW REGULATORY FRAMEWORK, HAS DECIDED TO ESTABLISH A CENTRE FOR STATISTICS AND INFORMATION ON THE TELECOMMUNICATIONS SECTOR.

IN PURSUIT OF THIS OBJECTIVE, SCT DEEMS AS AN ADEQUATE STRATEGY THE ADOPTION OF AN INCREMENTAL APPROACH, WHEREBY THE CENTRE WOULD EMERGE FROM A THREE-STAGE PROCESS:

- THE ELABORATION OF A QUARTERLY TELECOMMUNICATIONS REPORT
- THE IMPLEMENTATION OF A TELECOMMUNICATIONS MARKET INFORMATION SYSTEM
- THE DEFINITION OF INSTITUTIONAL CHANNELS WHICH SUPPORT THE EXPANSION OF THIS SYSTEM IN ORDER TO CREATE THE CENTRE.

ACORDINGLY, THE QUARTERLY TELECOMMUNICATIONS REPORT WILL ...

- SERVE AS THE INITIAL POINT OF REFERENCE IN THE IDENTIFICATION AND/OR DEFINITION OF THOSE DATA AND INDICATORS WHICH PROVE TO BE MOST RELEVANT TO THE NEEDS OF PRIVATE INVESTORS.
- ALLOW FOR THE NECESSARY LEARNING, THROUGH CONSTANT INTERACTION WITH THE INDUSTRY, IN THE SEETING UP OF A STATE-OF-THE-ART INFORMATION SYSTEM.
- FUNCTION AS A TEST BED FOR NEW SCHEMES OF INTER-GOVERNMENT COOPERATION IN THE USE OF INFORMATION PRODUCTS AS A TOOL FOR INDUSTRIAL POLICY, AND THE DEFINITION OF A NEW SET OF PUBLIC INFORMATION RULES .

THE TELECOMMUNICATIONS QUARTERLY REPORT WILL INITIALLY COVER FIVE MAIN AREAS...

1. REGULATORY MILESTONES AND UPDATE

- **KEY PAST DECISIONS IN THE TRANSFORMATION OF THE TELECOMMUNICATIONS REGULATORY FRAMEWORK**
- **STATUS OF PRESENT PRO-COMPETITION RULEMAKING SPECIFIC TO THE TELECOMMUNICATIONS SECTOR, AS WELL AS THAT IN OTHER AREAS OF THE ECONOMY WHICH CAN ALSO BE RELEVANT**

2. LICENCES

- By company, ownership, type of service and area of geographic coverage.
- Licence watch, or the update on the status of current licencing procedures.

3. MARKET INFORMATION

- **Evolution in the participation of different services in the size of Mexico’s telecommunications markets (actual and prospective)**
- **State and evolution of telecommunication markets infrastucture as related to competition and the introduction of new technologies.**
- **Actual and projected sociodemographic composition of the user base for each of these markets and services.**

4. INTERNATIONAL COMPARISON

- Benchmarking through the use of commonly accepted definitions as used by international telecommunications organisms (ITU, OECD)

- Identification of prevailing trend in the evolution of telecommunication markets worldwide which may suggest new information needs from the Mexican telecommunications industry.

5. DISAGGREGATED DATA BY GEOGRAPHICAL REGION AND STATE.

- Breakdown of the above indicators by density of users, actual and potential opportunities for expansion of coverage

KEY PROVISIONS IN ADDRESSING PROBLEMS OF COLLECTING AND HARMONISING DATA, AS WELL AS CONFIDENTIALITY CONCERNS...

STARTING POINTS

DETERMINATION OF BASIC RULES TO COMPILE A SET OF UNIFORM DEFINITONS ON AN INTRA-GOVERMENT REGULATION.

DEFINITION OF COMMON FORMATS AND PROCEDURES FOR THE DESIGN OF SURVEYS AND OTHER REQUIREMENTS TO THE INDUSTRY

CLOSE COOPERATION WITH THE NATIONAL STATISTICAL OFFICE IN THE DEFINITION OF THE LOGISTICS FOR THE SETTING UP OF INFORMATION SYSTEMS

CONSTANT CONSULTATION WITH THE INDUSTRY AS TO THE INFORMATION NEEDS FOR EACH RELEVANT MARKET

CONSENSUS BUILDING AS TO BASIC GUIDELINES FOR CONFIDENTIALITY RIGHTS ON AN INTRA GOVERNMENT LEVEL AS WELL AS AN INDUSTRIAL LEVEL.

CALENDAR

LOCAL CABLE BASED PUBLIC TELECOM NETWORKS

CONCESSION GRANTING	**STARTING OCTOBER 1995**

SPECTRUM BASED PUBLIC TELECOM NETWORKS

AUCTIONS	**STARTING 1996**

OTHER TARGET DATES

PRIVATIZATION OF MEXICAN SATELLITE SYSTEM.	**MID 1996**
CREATION OF NEW REGULATORY AGENCY.	**AUGUST 1996**

THE NEW
REGULATORY FRAMEWORK
WILL MAKE THE TELECOMMUNICATIONS SECTOR
A LEVER FOR MEXICO´S DEVELOPMENT

SCT

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

Document WTIM96/21-E
18 March, 1996
Original: Russian

World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: RCC, V. Sivoraksha

TITLE: REGIONAL STATISTICS

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REGIONAL STATISTICS
(experience, prospects)

Vladimir Grigoryevich SIVORAKSHA
Head, Department of Economics and
Finance, RCC Executive Committee

Establishment of regional statistics within the Regional Commonwealth the field of Communications (RCC)

Allow me first of all to say a few words about the RCC. The Commonwealth was established on 17 December 1991 by the P&T administrations of 12 newly independent States formed on the territory of the former Soviet Union. The purpose of this new regional entity, as embodied in its Charter, is wide cooperation and concerted efforts in the field of telecommunication and postal services.

Membership of the Commonwealth is open to the P&T administrations and operators of other States, and at 1 January 1996 the number of participants had risen to 20, including 13 full members and seven observers.

The RCC, in its capacity as a regional telecommunication organization, is officially registered as an observer with ITU and UPU.

The RCC's status is also defined within the CIS. The Council of Heads of Government of the CIS recognized the RCC as an intergovernmental coordinating body.

The work of the RCC is currently conducted in six committees, comprising experts from all the P&T administrations.

One aspect of the RCC's work is the production of annual statistical reports on the development of communications in CIS countries. An analysis of the data contained in these reports provides a general picture of telecommunications and telecommunication development trends in the CIS as a whole and in each individual country.

The report contains data characterizing the activities of each P&T administration in the year covered, in the following sections:

1) technical facilities in all sub-sectors of posts and telecommunications at the end of the year;
2) volume of communication services provided to customers during the year, demand for communication services per capita and per household, and level of customer service;
3) performance indicators;
4) national tariffs for basic P&T services for the general public and for commercial entities, expressed in national currency and in US dollars;
5) basic economic indicators (income, expenditure, profit, wage bill, capital investment), expressed in national currency and in US dollars;
6) activities of the P&T administrations in the field of legislation, regulation and management.

The volume of tabular information in our annual statistical report (for 1994) is slightly larger than in the ITU's report: 173 basic (primary) indicators as against 53 in the ITU report, and 55 comparative (secondary) indicators. These figures relate solely to the tabular information.

Unlike the ITU report, which, as is well known, offers a huge amount of analytical material on all aspects of the development of telecommunication services, our report does not contain any analytical surveys.

As I have mentioned, to facilitate comparison, tariffs for communication services and basic economic indicators expressed in monetary terms are given not only in each country's national currency but also in US dollars.

Amounts in national currency are converted into US dollars by the RCC Executive Committee on the basis of the mean exchange rate over the year.

This is done by taking the official exchange rate with the US dollar prevailing in national banks of nearby foreign countries at the end of each month quoted in the "Financial Times" newspaper and calculating the arithmetic mean of the 12 figures for the year, thus giving the national currency equivalent of 1 US dollar.

I shall not bore you with the many different figures contained in the report, but will merely give two examples:

1) The basic indicator used to characterize the level of telecommunication development and the level of customer service in developing countries is the number of basic telephones (main lines). In 1994, the number of basic telephones rose in almost all CIS countries (with two exceptions). Straight growth in the CIS as a whole represented 1 million units or 2.5%, with a maximum of 6% attained in Turkmenistan. The number of residential telephones rose during the year in all CIS countries, representing a straight increase of 1.3 million units or 4.3%.

2) The number of outgoing trunk telephone calls rose by 1.4% in comparison with 1993 in the CIS as a whole, growth being recorded in eight of the 12 countries.

It may thus be concluded from the above data that there is a trend towards some expansion of the telecommunication services provided. Moreover, this was achieved against the background of a significant drop in industrial output and GDP in all the CIS countries. The fall in GDP in the different countries ranged from 2 to 30% in 1994 and 1 to 17% in 1995.

Prospects

In what way do we intend to improve regional statistics in the future?

1 Data collection and dissemination methods

At present, statistical information is collected through national statistical bodies and through government offices, i.e. the P&T administrations. We believe the information collected by the administrations, which have the benefit of more highly qualified specialists, to be more reliable than that available in statistical bodies.

For this reason, we shall be cooperating with the administrations and receiving information from them. Of course, general economic information on each country comes from the statistical bodies. In particular, the territory of the former USSR is covered by the CIS regional statistical unit from which we obtain relevant information by purchasing their annual reports. Nevertheless, we cannot be sure that the statistical information received from the P&T administrations fully covers all P&T enterprises and companies in the country concerned (public, government, joint ventures, private).

There is a way of ensuring maximum coverage, in the reports, of organizations and companies of all types. In many countries, when the P&T administration issues licences to companies for the provision of a given communication service, reporting of the requisite information is mandatory (specified in the licence). We feel it is necessary to seek access to statistical data and information. At the moment, some companies, including large ones, are endeavouring to restrict the provision of particular information (e.g. international traffic), invoking the right to maintain commercial secrecy. We make our annual statistical report available to the P&T administrations, research institutes and all interested organizations and firms (for a moderate fee).

2 Comparability of statistical information

The break-up of the USSR four or five years ago marked the end of the unified instructions laying down and guaranteeing a unified approach to basic accounting and reporting of P&T indicators in all CIS countries. Therefore, the question of maintaining methodical comparability of telecommunication indicators in the CIS countries is now an important issue. We have decided to set up a common statistical database for the RCC and ensure that the indicators in this base are methodically comparable. A draft set of indicators for the RCC's database has been developed and distributed for perusal and discussion to all RCC administrations.

The principles on which the RCC database is established are as follows:

1) The database will include the basic reporting indicators in the CIS countries.
2) Efforts will be made to align them on the indicators used in the ITU annual report.

Once the "List of indicators in the common database" has been agreed upon and adopted in the RCC's committee on the economic aspects of communications, instructions will be elaborated in the form of "Methodical explanations for statistical indicators in the RCC database". When finalized, this document will be submitted for adoption by the Council of Heads of RCC Administrations.

Obviously, the common database being set up by RCC will not be immutable. Provision must be made in the decision of the Council of Heads of RCC Administrations to empower the RCC's committee on economic aspects of communications to improve the database. This is necessary on account of the constant emergence of new types of communication services and the need to include them in the database. Moreover, technology and the accounting principles for a number of indicators are constantly changing, telecommunication and computer networks are converging, etc. All this calls for refinement of the concepts and characteristics of indicators and, in turn, refinement of the methodical instructions governing indicators in the database.

There will be a need to codify the system of indicators established in the RCC common statistical database and store the data on diskettes and in a computer network. This task will be addressed in the near future.

I am confident that this telecommunication indicators meeting will be useful for all participants, that it will help the ITU secretariat and that it will further enhance systems of telecommunication indicators, and I wish to thank the ITU/BDT for its invitation to the meeting.

V. SIVORAKSHA

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

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World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: ATO (Sénégal), Gaston Zongo

TITLE: INVESTIGATION OF THE REASONS FOR LOW TELEDENSITY AND PRODUCTIVITY IN THE AFRICAN TELECOMMUNICATION SECTOR

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AFRICAN TELECOMMUNICATION OBSERVATORY

WORLD TELECOMMUNICATION INDICATORS MEETING

(ITU/BDT, Geneva, 19-21 March 1996)

COMMUNICATION:

INVESTIGATION OF THE REASONS FOR LOW TELEDENSITY AND PRODUCTIVITY IN THE AFRICAN TELECOMMUNICATION SECTOR

GASTON ZONGO

I Introduction

One of the main problems encountered by African telecommunication operators, apart from funding and management, is effective planning. Even though external expert assistance has been brought in for the preparation of master plans, usually through international cooperation, in particular ITU, the lack of precise, calibrated and consistent data has always been a severe handicap to strategic decision-making.

Reliable statistics must be kept regularly and rigorously in order to establish relevant development indicators, as the raw material and basic data not only for medium- and long-term planning, but also for analyses with a view to measures to restructure and improve telecommunication sector management.

In this respect, recognition is due to ITU for the unstinting support it provides to its Member countries, especially the least developed countries, in monitoring statistics and development indicators and especially, at a more general level, establishing information management systems (IMS).

The purpose of this paper, which begins with an introduction to the African Telecommunication Observatory, is to share a few thoughts on an economic approach to African telecommunication development indicators, taking two specific indicators, teledensity and productivity, and attempting to identify the probable reasons for which they are both so low in the case of African operators.

II African Telecommunication Observatory

II.1 General background

The telecommunication sector in Africa, and especially sub-Saharan Africa, has since the 1980s undergone radical change at three levels - institutional, structural and technological.

Swept along by such changes at global level, and in order to survive, the African telecommunication sector has been obliged to join in the headlong race without always being able to keep proper balance - a race in which the advantages of youth do not always compensate for lack of experience based on analysis of a solid past.

A brief comparative overview of the management of telecommunication networks at global level -from the optical-relay telegraph of Claude Chappe, France (1794), the electrical telegraph of William Cooke and Charles Wheatstone in the United Kingdom (1837) and Samuel Morse and Alfred Vail in the United States (1838), the invention ofthe telephone by Alexander Graham Bell (1876), right up to the divestiture of the American giant AT&T (Consent Decree, 1982) - shows that networks were operated first by the private sector, then by the public sector, and are now converging once again towards the private sector, with the specific exception nevertheless of the *de facto* AT&T monopoly in the United States.

The African countries for their part did not begin managing their own networks until the 1960s, when they became politically independent, and they naturally imported the models used by whichever country tad colonized them.

Having barely separated from the postal service, African telecommunication operators are functioning in an environment in which strategic decisions have to be taken on the optimum structure and institutional framework, having due regard not only for technological advance within the sector but also, and above all, for the new rules of a market characterized mainly by the opening of frontiers and crumbling of monopolies.

Within this context, a dynamic analysis of sectoral evolution is required if we are to provide ourselves with the necessary information to control the changes to come.

While other continents have national, regional and even private structures to provide this kind of analysis of trends in the telecommunication sectors, this is not the case in sub-Saharan Africa, where government statistics services process data virtually exclusively related to other sectors of the economy, integrating telecommunication aspects only for macro-economic aggregates.

Given the importance of the role played by telecommunications in economic and social development, a facility to monitor and assess sectoral performance is indispensable, especially within the new environment that is emerging and indeed already taking definite shape**.**

The African Telecommunication Observatory is intended to help to satisfy that requirement.

II.2 Objectives

The African Telecommunication Observatory has inter alla the following three basic objectives:

1 Database in Africa

The African Telecommunication Observatory is intended to be a permanent source of updated and validated information accessible in real time, to provide formal, technical, economic and financial data and the raw material for studies based on this wealth of information.

2 Economic studies and analysis

Using the data gathered and reprocessed to ensure consistency, the African Telecommunication Observatory intends to focus efforts to understand the sector far more on the sector's role in economic activity and on the factors which determine the productivity of telecommunication services. It also aims, by means of quantitative and qualitative assessment, to highlight the strategic importance of the telecommunication sector and its impact on the growth and competitiveness of others sectors.

These studies and analyses should provide each State or operator with a basis for comparison, in order to identify more clearly the strengths and weaknesses of the telecommunication enterprises and as additional tools in setting future objectives in an environment which is in the throes of radical technological, structural and institutional change.

In addition, they should serve as a basis for measures to rectify and/or improve network management in all respects.

3 Regional integration, international cooperation and partnership

The African Telecommunication Observatory wishes to:

- develop a technical observation facility in Africa to feed the formation of an African perspective;
- provide input to foster a constructive dialogue between all parties;
- promote better mutual understanding through exchange and sharing of information and experience;

1 OECD, EUROSTAT, IDATE, EITO, IREST, OMSYC, BIS STRATEGIC DECISIONS, DATAQUEST, PYRAMID, STATISTICS CANADA, etc.

- promote African telecommunications by bridging a certain communication gap between different partners (governments, regulators, operators, donors, international organizations, etc.);
- upgrade African expertise.

4 Strategy for data collection in Africa

As mentioned above, the lack of a suitable structure for local data collection is a major obstacle. Hence, it might be appropriate to contemplate a regional structure to centralize the data collected by subregional units and to reprocess and harmonize them in the light of specific regional and subregional characteristics, before forwarding them to ITU for incorporation and integration at global level.

The African Telecommunication Observatory, the idea for which first came to light at a session of the administrative council of the member countries of ESMT (Benin, Burkina Faso, Mali, Mauritania, Niger, Senegal, Togo), is intended to converge towards a regionally integrated structure of such a kind, involving all players in the African telecommunication sector and their development partners. Within this framework, the project has started up with funding from French Cooperation, the intention being to establish an institutional framework which ultimately guarantees a certain degree of independence.

To this end, and given the scale of the project, other donors are being approached.

III Teledensity and productivity in the African telecommunication sector

The performance of the African telecommunication sector is often assessed in terms of Teledensity and productivity.

III.1 Teledensity

Teledensity, expressed as the number of main lines (ML) per 100 inhabitants, provides a technical indicator of network development which for the African telecommunication sector is very low in comparison with the developed countries.

While this indicator serves some purpose, for example as a planning tool, its use to assess the performance of African operators might take a certain number of socio-economic considerations into account, thus making better allowance for the specific characteristics of the African environment.

This in no way seeks to refute the general acknowledgement that Africa's telecommunication network is relatively underdeveloped. The purpose of this paper is to provide food for thought on approaches to assess the distribution of telecommunication services in Africa and examine how action undertaken by certain African operators helps mitigate the poor performances resulting from this low teledensity.

III.1.1 Low teledensity

Numerous analyses have attributed the low telephone density in Africa to problems related to shortage of investment capital, the State monopoly environment, etc. In the same vein, the

paradoxes characterizing the sub-Saharan telecommunication sector have been highlighted and extensively elaborated upon in many reports.

Nevertheless, we also consider it important to take account of several other factors when analysing teledensity in sub-Saharan Africa, as direct comparison with the developed countries may mask certain specifically African realities.

The following may be quoted as examples:

1) The economic development gap between urban and rural areas leads operators to focus investment on urban areas (70-80% of ML), to satisfy the exigencies of financial profitability and the reimbursement of investment loans. This gap is less pronounced in developed countries.

2) Companies are relatively small and consequently use relatively few network lines in their PABXs.

3) Priority accorded to the water, health and education sectors has helped to raise the life expectancy of a population with an average birth rate of 6-7 compared with 1.6 for Europe (1.6 for France), and a population growth rate of around 3% per annum.

4) The average size of a household is estimated at 10 people. Furthermore, and of particular relevance to the analysis, the sense of solidarity and community life is far greater than in the developed countries, where people are more individualistic.

5) The inability to monitor GDP properly, given the inaccuracy of statistics in particular with regard to contributions from undeclared sectors and even a substantial part of the agricultural sector, limits the relevance of analysing performance within the African telecommunication sector using a JIPP curve (GDP/teledensity).

   It might be more appropriate to attempt a comparison with purchasing power parity, even if this includes traditional GDP.

6) The *de jure* rather than *de facto* monopoly has contributed considerably to entrenching African telecommunication operators in an approach focused on limiting anticipated losses due to non-satisfaction of so-called "demand", and consequently on increasing the number of telephone lines, rather than an approach based on profits, focused on increasing the latter for subsequent use to increase quantity.

In their investment strategies, not all operators seem to draw a distinction between "requirement" and "demand".

A declared but not viable requirement cannot be regarded as demand in economic terms.

We therefore consider that demand elasticity in relation to price should be analysed more in terms of increase in the volume of communications rather than simply in terms of the number of new lines created. In other words, network profitability and revenue do not depend simply on the total number of main lines.

The relatively high cancellation rate and difficulties in collecting dues from private customers provide a good indication of this misconception.

III.1.2 Accessibility

In their statements of general policy, all operators set themselves the objective of providing telecommunication services to as many people as possible at the lowest possible cost, or at least at a suitable cost.

Nevertheless, for reasons evoked both here and elsewhere, it is difficult for African operators to attain this objective in the short term, especially when they endeavour to provide each inhabitant or even household with a telephone line. The obstacles to be removed are numerous and varied, and it is not necessarily the ideal objective at the current stage of development in Africa.

On the other hand, and despite the low teledensity, the adoption of an appropriate technological/commercial strategy would make it possible to improve accessibility to telecommunication services both in urban and rural areas.
The example set by the Senegalese operator SONATEL is especially noteworthy in this respect, in particular its policy to develop private telecommunication centres (PTCs) in urban areas and "phone-points" or community telephones in village communities.

Our recent study in this respect highlighted the following main points:

With a teledensity of 0.95 ML/100 inhabitants, which is a more than reasonable performance for the subregion, SONATEL has achieved the following results with its PTC policy:

(It should be noted that a PTC is a centre where a private operator, under specific terms set down in a contract with the main operator, sells telecommunication services to the public.)

1) The number of PTCs rose from 541 in 1993 to 2 042 in 1995, i.e. it quadrupled in three years.
2) The number of main lines in the PTCs rose from 903 in 1993 to 3 272 in 1995, i.e. it tripled over the same three years. In 1995, PTC main lines (telephone and fax) represented 4.1% of SONATEL's total.
3) The number of permanent jobs in the PTCs rose from 1 082 in 1993 to 4 084 in 1995, representing twice SONATEL's total permanent staff. The jobs represent 5.3% of all private-sector paid jobs in Senegal.
4) Turnover realized by the PTCs on SONATEL's behalf represented 5.5% of SONATEL's total turnover in 1994, and 15% of total telephone invoicing.

   In 1995, it may be estimated that almost a quarter of outgoing calls from Senegal were made from the PTCs, from public telephone booths or from telecommunication centres belonging to SONATEL.
5) The PTC's turnover per ML represents four times that of SONATEL.
6) The cost of a local three-minute telephone call is 100 CFA francs in the PTCs, which allows SONATEL to sell the telephone "retail" and make it accessible to the general public.

   The effect of this strategy is to increase the volume of communications by lowering the cost of services to suit the population's social conditions and by adapting to the local economic environment in which everything is sold retail, thus at the same time mitigating the adverse effects of low teledensity.

   The policy of phone-points in rural areas is based on the same strategy.

III.2 Productivity

The productivity indicator, expressed as the number of staff per 1 000 ML, is also relatively poor for African telecommunication operators compared with results obtained in developed countries. The indicator varies from 20 in the best cases, 45-50 on average, to as much as 80 for certain operators, compared for example with five for France Telecom.

While these poor results reflect overstaffmg in relation to the low number of telephone lines, the following may be identified as fundamental causes:

1) For some time now, staff have been engaged on the basis of social considerations, with the operator under the influence of a public administration which for various reasons has to find employment.
2) When implementing major investment prograrnmes, operators have often recruited massively and then been obliged to keep staff on once the work has been completed, even if the original employment contracts were fixed term.
3) Network topology, dictated by the urban structure of areas to be served, obliges the operator to have sufficient for implementation and maintenance, even if the amount of infrastructures is small. In the light of distances and transportation difficulties, a minimum number of staff is required in remote areas in order to ensure network reliability.
4) A further handicap has sometimes resulted from delays in introducing new technologies requiring fewer staff.
5) Local labour is often less costly than mechanization.
6) The long recognized unavailability of qualified local subcontractors has sometimes obliged operators to carry out themselves work which operators in developed countries would usually contract out.

The past therefore constitutes a heavy burden, but one which African operators are fortunately beginning to shake off, with the encouragement and assistance of donors.

Thus, most operators currently apply a zero-growth policy to staffing, while raising the proportion of managerial staff and staff qualification levels. This is facilitated by introducing new technologies requiring fewer staff.

Operators are consequently recording a sustained increase in added value per staff member, even though the average wage is increasing.

Similarly, the ratio of staff costs to added value is developing positively for a large number of operators, and payrolls (GINI index) show a shift of concentration towards higher grades.

As the majority of employees earn the lowest salaries, the financial consequences of overstaffmg are often negligible save in so far as it undermines any potential spirit of enterprise. The workforce variable thus has no very significant financial effect on the potential benefits of capital intensity.

On the other hand, the following points may well be more serious:

Individual performance, which in the area of a leading-edge technology like telecommunications should increase, actually decreases owing to the scientific isolation of African managerial staff, and their ability to adapt to technological change declines sharply with age.

In addition, the average retirement age is 55, but managers are relatively quite old (27, 28 and even 30) when they take up their posts.

This situation poses many problems with regard to amortization of training investments.

Ratios (staff costs/added value, staff costs/operating costs, added value/workforce) are certainly highly influenced by the tariffs applied and international traffic flow, however their analysis in conjunction with productivity is a useful tool for assessing staff performance.

IV Conclusions

The importance of telecommunication development indicators requires no further demonstration, especially for the developing countries, whose need to increase their potential is greater.

We therefore consider it extremely important for Africa, with the assistance of international cooperation, to equip itself with an effective means to produce regular strategic information on trends in the telecommunication sector, and respond more promptly and with greater accuracy to the requests of ITU, which will ultimately have global data at its fingertips once it has aggregated all data supplied by all regions.

We are certainly not aware of the existence of any international reference standards or thresholds either for teledensity or productivity; however, comparison between geographical areas with roughly the same characteristics could provide operators with a basis for their strategies.
Furthermore, in our opinion a valid indicator should be sufficiently expressive and easy to calculate, as in the case of teledensity and productivity; these are definitely useful elements of an initial approach to telecommunication development assessment.

The concept of accessibility which is of concern to African operators may be characterized by three factors:

- line availability (good working order)
- remoteness, or average minimum distance to be covered to reach the line (geographical distribution or dispersion)
- price of service.

As an indicator, accessibility is certainly difficult to calculate even if one intuitively perceives an improvement.

Taking account of the specific characteristics of Africa, new avenues of thought may open up, which we believe, once explored, may lead to results and thence solutions, if only partial, to the problem of the chronic underdevelopment of the African telecommunication sector, particularly in the context of the radical changes which are afoot.

Session 6: Using Statistics

Telecommunication statistics are used by a variety of different people: policy-makers, regulators, operators, researchers, financial analysts, press. This session reviews different perspectives of what indicators are important and why.

"Benchmarking"
R. Worthington, Pomona College (USA)

"Country policy use"
J. Houghton, *BIA,* Australia

S.6: Using Statistics

Wednesday
20 March

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

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(Geneva, 19 - 21 March 1996)

SOURCE: POMONA COLLEGE (USA), Richard Worthington

TITLE: A PERFORMANCE ASSESSMENT FRAMEWORK FOR THE GLOBAL TELECOMMUNICATIONS INDUSTRY

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for the Global Telecommunications Industry

Richard Worthington
Pomona College
and
Center for Telecommunications Management
University of Southern California, USA

present to

World Telecommunication Indicator 1996
International Telecommunication Union
Geneva, Switzerland
19, 20, 21 March 1996

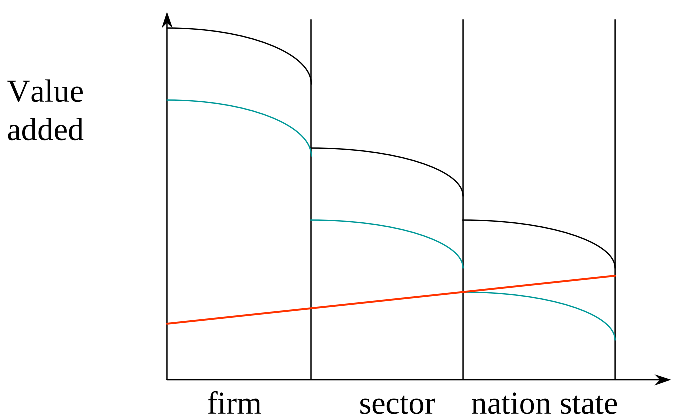
Objective

- " The principal research goal is to create a FRAMEWORK for consideration by the industry, to be used in evaluating the performance capabilities of telecom infrastructures on an absolute and relative basis" - CTM Research Proposal
- Research Philosophy
  - Academic/industry collaboration
  - Multinational research team
- Actions
  - Inventory metrics and indicators
  - Collect and analyze data
  - Design proposed framework elements
  - Recommendations for implementation

Research Design

- Literature review
- Questionnaire design and distribution
- Database construction and analysis
- Interviews
- Report preparation & dissemination

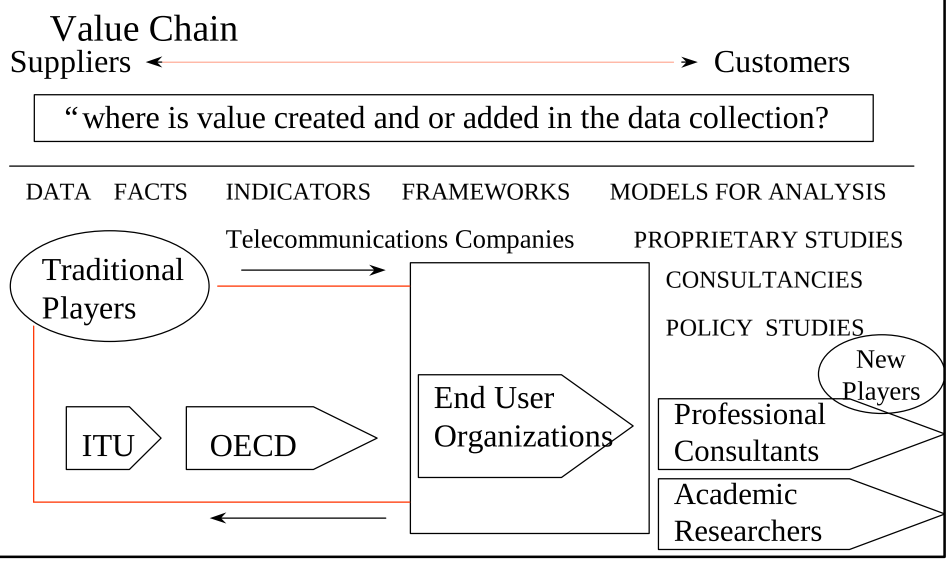
Value-added through framework application in a liberalizing world



Key:

value-added when standardization of metrics and reporting of data are high
value-added when standardization of metrics and reporting of data are low
value-added in traditional data collection under monopoly regime

Changing Players in Telecom Performance Research



Performance Assessment Framework

- Customer Satisfaction
- Service Quality and Network Reliability
- Speed and Responsiveness to Markets
- Technology and Network Modernization
- Fulfillment of Franchise Requirement
- Global Access and Interoperability
- Price and Usage Structure
- Productivity of Resources and Assets

Attribute - Customer Satisfaction

- Customer trouble reports
- Customer out of service reports
- Hours during which customer service is available (P)
- Customer satisfaction with installation, repair, and business office service, segmented by large business, small business and residential customers (P)
- Percent of subscribers who elect to change service provider (P)

Attribute - Service Quality and Network Reliability

- Call failure rates
- Faults repaired within 24 hours
- Percentage of payphone that are cardphones
- Percentage of unsuccessful local calls
- International call completion rate
- Total minutes of switching downtime per year
- availability of itemized billing
- Company certified under ISO 9000 series? (P)

Attribute - Speed and Responsiveness to Markets

- Average wait time for installation of business and residential service
- Average length of time for rollout of new services
- Percentage of sales from new services

Attribute - Technology and Network Modernization

- Expenditures on R&D in following categories: basic, infrastructure, and applications (P)
- Number of R&F collaborative projects (P)
- Number of patents attained and outstanding
- Mainlines served by digital switches
- Mainlines equipped with digital transmission technology
- Deployment of fiber optic cable as percent of total

Attribute - Fulfillment of Franchise Requirement

- Mainlines per 100 inhabitants (teledensity)
- Percentage mainlines urban, rural, residential and business
- % of schools and libraries with Internet access (P)
- % of exchanges with 100% of lines served by emergency services (P)
- Interferon funding law? (P)
- Citizen Utility Board structure (P)

Attribute - Global Access and Interoperability

- Percent of network with x.400 (and potentially x.500)
- Percent of network with EDIFACT/xI2
- Percent of network with x.25/x.75
- Percent of network with ISDN (basic rate)

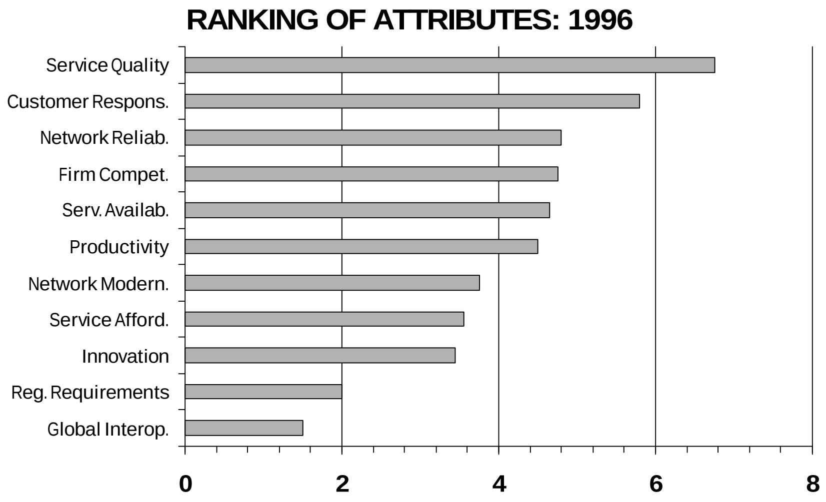
Attribute - Price and Usage Structure

- Tariff basket data
- Traffic data
- Percentage of customers subscribing to calling plants/package offers (P)

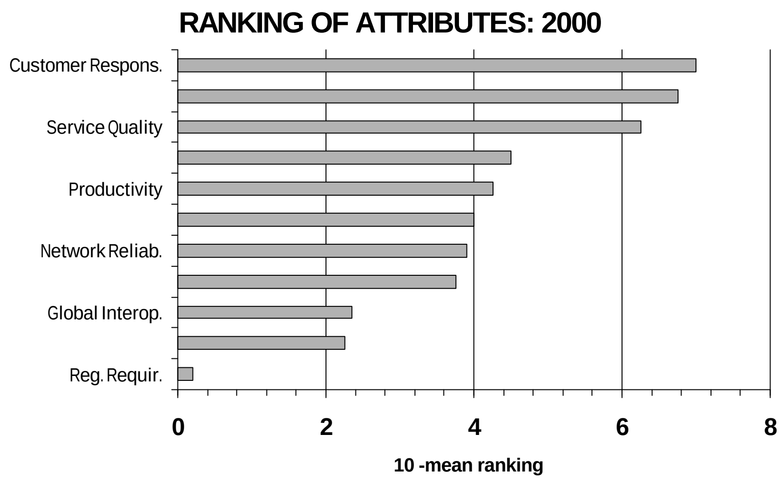
Attribute - Productivity of Resources and Assets

- Capital expenditure on switching and transmission for transport and access elements of the network (P)
- Capital stock (fixed and total assets)
- Employee working conditions (P)
- Employee training (P)

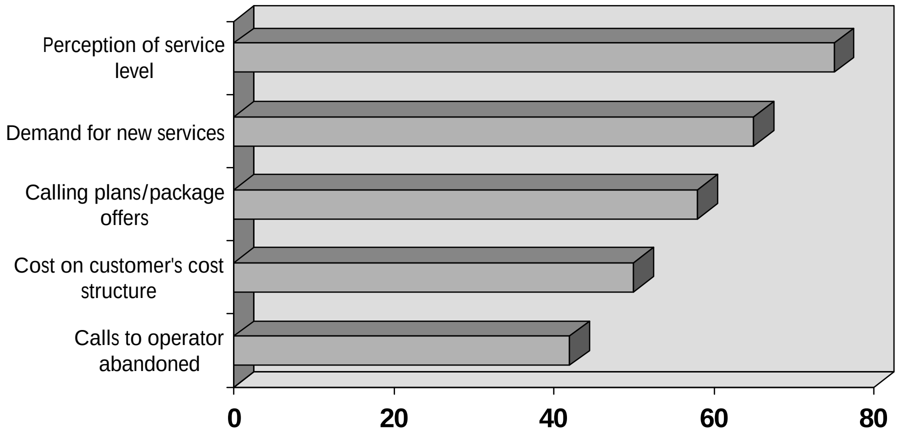
Ranking of Attributes



Ranking of Attributes



Percentage of Telecommunication Services Providers Monitoring Selected Quality Items



Survey of Customer Satisfaction

Residential

ONE THING COMPANY HAS DONE TO IMPRESS ME - RESIDENTIAL		ONE THING COMPANY HAS DONE TO ANNOY ME	
Category	Percentage	Category	Percentage
Service	22	Many Sales Calls	17
Price	13	Poor Performance	13
Features	10	Price	12
Billing	5	Billing	7
Dependability	5	Service	7
Programs	3	Program	6
Technology	2	Advertisements	5
Nothing	38	Nothing	30

Survey of Customer Satisfaction

Business

ONE THING COMPANY HAS DONE TO IMPRESS ME - RESIDENTIAL		ONE THING COMPANY HAS DONE TO ANNOY ME	
Category	Percentage	Category	Percentage
Service	53	Service	45
Price	10	CSRs	12
Billing	10	Billing	10
Dependability	8	Unreliable	6
Features	5	Too many calls	6
Nothing	8	Nothing	6

Source: Unisys, "Act Now! You may already be a loser", *Unisys*, November 1995

Telecom infrastructure and economic growth

	Growth in GDP per capita	
	Model 1	Model 2
10% Growth in Mainlines	2.9%	2.1%
R. square	0.64	0.63

Source: J.J. Hanlev and R.K. Worthington. " The Global Telecommunications Infrastructure: A Framework for Analysis of Industrial Performance and Effectiveness". ITU. Seventh World Telecommunication Forum. Volume 2. Geneva. 1995. pp.. 73-77.

Working Conditions and Service Quality Performance

Industry	*Service Quality*	*Wages*	*Employee Turnover*	*Percent of nonsupervisory employees unionized*
Cable TV - high skill, low wage	Low	US$ 11.35/hr.	High	5%
Telcos - high skill, high wage	High	US$ 15.50/hr.	Low	70%

Adapted from Patrick J. Hunt, "Wage models for the communications industry," *Installation and Maintenance,* October/November 1993, and Communications Workers of America, *Preserving High-Wage Employment in Telecommunications: CWA Public Policy Recommendations for a Competitive Regulatory Framework* , Washington, DC, 1994.

Recommendations and conclusions

- Using the framework is more important than perfecting it
- Seven approached to performance assessment
  - Regulator/Core provider
  - Recognition
  - Certification
  - Industry cooperation
  - Commercialization
  - Scorecards
- Coordination of key players
  - Pool resources
  - reduce overlapping requests
  - Assure consistency in distributes and reporting
  - Consistency in distribution of information
- Continues research and development

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

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SOURCE: BIE (AUS), John W. Houghton

TITLE: COUNTRY POLICY USE OF TELECOMMUNICATIONS PERFORMANCE INDICATORS IN AUSTRALIA

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Country policy use of Telecommunications Performance Indicators in Australia

John W. Houghton
Principal Economist
Bureau of Industry Economics

Transcript of a presentation to the World Telecommunications Indicators Meeting, at the International Telecommunications Union, Geneva, 19-21 March, 1996

The Bureau of Industry Economics, a centre for research into the manufacturing and services sectors, is formally attached to the Department of Industry, Science and Technology. It has professional independence in conducting and reporting it is research.

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Introduction

I have been invited to discuss my work at the Bureau of Industry Economics benchmarking Australia's infrastructure services, including telecommunications and the broader information infrastructure. So, the aim of this paper is to share some thoughts about the telecommunications performance indicators we use, how and why we use them, what we found in our most recent study (published in March 1995) and some of the issues we confronted. But first, I want to put our work into the broader Australian policy context.

While my knowledge of the details of policy discussion in other countries is limited, I understand that Australia is unusual in the extent to which there is an explicit micro-economic reform agenda. Why?

Well, by the mid 1970s it had become apparent that the protectionist regime Australia ran during the post-war boom years could no longer deliver sustainable economic growth and full employment. High tariff protection was seen as one of the factors contributing to an inward looking, and uncompetitive manufacturing sector, and the extent of financial regulation was believed to be having a negative impact on the effectiveness of monetary policy.

In 1983, the Australian dollar was floated, and most exchange controls abolished. And during the 1980s government introduced a program of phased tariff reductions. These trade policy reforms increased the competitiveness of the traded sector. But, there were many goods and services inputs to that sector provided by enterprises not themselves subject to the same competitive pressures, such as public utilities, some of the professions and areas of agricultural marketing.

By the late 1980s, there was an increasing focus on the need to reduce the cost of basic infrastructure and services inputs to trade exposed industries. In 1987, the government introduced a package of reforms aimed at government business enterprises, and in March 1991, the Prime Minister directed the Bureau of Industry Economics to identify the importance of major infrastructure services in business costs, develop relevant measures for international comparisons and publish performance comparisons on a regular basis. This work was extended in 1994 to include core government services.

To date, we have published international benchmarking studies of electricity supply, rail freight, road freight, ports, coastal shipping, aviation, gas supply and telecommunications. In addition to regular updates of these, current studies include: road construction, water and sewage, the science system, business licensing and the national information infrastructure. So, our interest in telecommunications performance indicators is a part of a broader body of work.

The sample for the BIE's 1995 Telecommunications study included the OECD and 6 of the more developed Asian countries: Hong Kong, the Republic of Korea, Malaysia, Singapore, Thailand and Taiwan. As in all our international performance comparisons, we focused on price, quality of service and operational efficiency. I want to explore each of these in turn.

Prices

We sought to assess the extent to which business users in Australia are advantaged or disadvantaged by the prices they pay for telecommunication services. But, of course, price comparisons are not straight forward. Communications prices are multifaceted. Charges are made for installation, rental, subscription and usage. And there are a number of ways to compare prices.

Simple rate comparisons compare each of these charges individually. They have the advantage of simplicity and of wider international coverage, but they don't reflect the total service charge picture very well. Using a basket approach combines all the charge elements into a representative user basket, and gives a better view of the overall picture. But the coverage of internationally comparable data for baskets is limited to the OECD. So, we undertook both simple rate and basket comparisons, in an attempt to get as wide an international coverage as possible, and as a double check on the results.

Our simple rate comparisons included: business user fixed charges; the price of a 3 minute, long distance call at peak rate up to 100 kilometres; the price of a 3 minute peak rate international call; mobile fixed charges; and the price of a 1 minute mobile call to a distance of less than 110 kilometres.

So, in terms of simple rate comparisons, we found that Australia performed well on cellular mobile charges, but rather less well on business fixed charges, international and national trunk charges. We found that the Asian countries in the sample, excluding Japan, had among the lowest business fixed charges, but higher usage charges. Which suggests that they may be at an earlier phase, or simply experiencing less rate rebalancing.

We also used OECD tariff baskets, including: the national business, international, PSDN, mobile, leased line and composite business baskets. We found that Australia performed relatively poorly in the national business basket, but quite well in the international and cellular mobile baskets. Australia fell below the OECD average in the PSDN basket, but performed relatively well overall in the leased line baskets. In terms of the composite business basket, we found that Australia ranked marginally above the OECD average.

We also undertook a comparative static analysis of rankings in 1992 and 1994, to get a picture of Australia's relative progress. We found that Australia's position had remained unchanged in the national business, international call and mobile baskets, improved in the leased line baskets, but had fallen behind in the PSDN basket. Interestingly, we found that Australia's ranking in the composite business basket had remained *unchanged since 1989.*

Now, as we all know, tariff basket comparisons are based on published tariffs. They do not reflect the prices paid by customers able to take advantage of discount schemes. So we attempted to construct representative baskets for small, medium and large business users, and to apply discounts to them.

To construct these baskets we took the OECD national business basket, and factored up the dollar value by the weightings from the composite basket. This basket was taken to represent small business users. Medium business users were represented by this basket x50, and large business users by this basket x500. This allowed us to make account estimates based on list prices for small, medium and large business users.

Published discounts were then applied to the small, medium and large business user baskets on a service category-by-category basis, using the best available discounts. For example, a 20 per cent discount on mobile calls would reduce the overall basket charges by 1.34 per cent. That is, 20 per cent of the 67 per cent usage element, of the 10 per cent mobile element.

There are two important embedded assumptions in this construction. Firstly, use patterns are held constant while scaling up for the medium and large business users. Secondly, the composite basket services proportions are held constant for small, medium and large users.

Though severely hampered by a lack of data, our analysis suggested that the discounts available in Australia were among the highest in OECD countries, but did not produce substantial changes to the relative rankings.

We unashamedly borrowed the OECD's time series analysis. Our examination of the national business basket revealed falling prices in Australia since the introduction of competition in 1992. However, we found that tariff falls in Australia at 9 per cent over the period 1990 to 1994, were less than the OECD average fall (15 per cent). Similarly, peak rate 3 minute international call tariffs in Australia declined by 28 per cent, while the OECD average decline was 35 per cent. However, cellular mobile tariffs in Australia fell 26 per cent, compared to an OECD average decline of 21 per cent.

The reason for Australia's relatively poor performance over the 1990 to 1994 period appears to have been price increases between 1990 and 1992. Immediately before the introduction of competition.

In comparing prices we confronted a number of problematic issues. We faced all the usual problems associated with using representative models and choosing to compare on the basis of exchange rates or PPPs. But the main questions emerging were:

- how to deal with comparisons in multi-layer and multi-player competitive markets. Should we compare interconnect prices? Should we include service providers and callback operators?

- how to deal with discounts in markets where private deals with major business users are common, and there are numerous long and short lived discounts available;
- how to deal with discounts to specific classes of users and/or specific regions;
- how to deal with regulatory differences - such as Australia’s untimed local calls;
- how to bring Asian countries into the price comparisons;
- and how to account more meaningfully for ‘environmental’ factors.

On this last point it is worth mentioning that in rail freight benchmarking, we use a model developed by the consulting company, Travers Morgan, which standardises international comparisons by making allowances for the impacts of key environmental factors, such as scale and traffic density.

A similar model for telecommunications, allowing for such things as: switching scale, size of local call zones, population size, density and age distribution, urbanisation, and characteristic business size and trading patterns would be an interesting and welcome development.

Quality of Service and Innovation

Quality of service indicators are possibly the most problematic. We attempted to focus on a few key indicators of quality of service and innovation. These included:

- IDD completion rates based on answer seizure ratios, which we believe important to business users in trade exposed industries,
- faults cleared within 24 hours,
- and mobile call drop-out, for which we could find little data.

Our innovation indicators included: cellular mobile subscribers per 100 population, percentage of digital mainlines, compound annual growth rate in optical fibre, and the availability of itemised billing.

We found that Australia was performing reasonably well on most of these indicators, but was generally below international best practice.

One of the main issues is the trend towards using customer surveys. The dangers of this were brought home to me at a conference presentation I attended last year. A senior executive of Telecom New Zealand gave a presentation in two parts. The first discussed the enormous success Telecom New Zealand were having with their advertising campaign featuring ‘Spot’, the dog. And the second, discussed the improvement in Telecom New Zealand’s customer service since privatisation. We were told in one breath, that the advertising campaign had been very successful in changing customer perceptions. And in the next, that service had improved according to customer surveys. Now there is an obvious danger here.

With deregulation and evolving competition, customers are bombarded with well funded and targeted advertising campaigns. Campaigns that would not attract the hundreds of millions of dollars spent on them, if they were not effective in changing customer perceptions. In such a context it would be misleading to rely on customer perceptions as the only indicators of service quality. While opinions and perceptions can complement the more traditional, engineering-based indicators, they cannot and should not be substitutes for them.

It is also worth noting that feedback from business users in Australia, suggested that larger companies often have extensive and up-to-the-minute service statistics relating to their voice and data networks. In surveying customers, it seems to me, that we should focus on business users. They are somewhat less likely to be misled by advertising, and much more likely to have some hard data - objective, engineering-based indicators of performance. To date, I suspect that this source of data has not been fully explored.

Operational Efficiency

The third major area of performance we examined was operational efficiency.

There are difficulties in choosing measures of output and input that reflect the operations of any business. Partial productivity indicators need to be interpreted with caution, because of changing input mixes. To get an accurate impression of overall productivity it is necessary to look at all outputs and all inputs. So we constructed a multifactor productivity model for international comparisons, and a total factor productivity model for Telstra.

Our multi-factor productivity model portrayed a telecommunications industry which produces both the network, or lines, and services, or calls by combining labour, or full time equivalent employees, and capital, or the estimated dollar value of network capital stock. The output index was constructed by combining *lines* and *calls*, according to the division of labour costs, between fixed labour costs, relating to the construction and maintenance of the network, and variable labour costs, relating to traffic levels. The input index was constructed as the sum of labour and capital weighted by the ratio of 1992 labour costs to the value of the annual user cost of capital.

Our labour productivity index showed that Australia was the worst performing in the 11 country sample in 1992. Australia ranked 7th in terms of the capital productivity index, and 8th in terms of the Multi Factor Productivity index. Clearly, Telstra’s labour productivity has been low by international standards.

One of the major barriers we encountered in the Multi Factor Productivity analysis, was the paucity and unreliability of call data - be it calls, minutes, pulses, erlangs or whatever. We also found it impossible to get internationally comparable data for Total Factor Productivity analysis. Although the work that the ITU have been doing on operator indicators is a major step forward.

One of the difficulties faced in calculating operational efficiency is estimating the value of capital stock. Capital stock is not consumed in the current period in the way that other inputs are. It is durable - consumed over a number of years. Estimates of the value of capital stock must take account of this gradual consumption. Moreover, in industries like telecommunications, technological change can have a profound, and sometimes unpredictable effect on the value of the existing network capital stock, and on the fraction of that stock consumed in any one year.

In calculating capital stock values, we used a 12 year investment series. While it is usual to deflate the capital series, we did not do so. Our intention was to take some account of the pace of technological change, and consequent changes in cost - functionality. But our formulation was very crude. Clearly, we need to develop a way to systematically factor cost - functionality changes into the valuation of capital stock.

We also confronted problems related to Australia's competitive telecommunications market. It seems unreasonable to compare incumbents with new entrants. They are different types of organisation. So, I assume we should compare incumbents with other incumbents internationally, and new entrants with other new entrants.

Specialist mobile carriers face completely different economies of scale. So, I assume we should compare mobile carriers with each other, and not with fixed-network carriers.

There seem to be significant economies of scope in the provision of telephony, and what is variously called pay, cable or subscription TV. Should we distinguish between types of fixed-network facilities, and only compare operators of the same type?

And in a multi-layer industry, should we compare service providers, IAPs and ISPs? If so, how? And who with? It is not simply a question of extending coverage, there are 'channel' issues to consider. There is, for example, a sense in which 'switchless resellers' represent an implicit contracting out of carrier customer relations and marketing functions. So it is not clear how, or even if, the service provider industry should be accommodated.

Conclusion

I have run out of time without even mentioning the information infrastructure benchmarking we are about to commence. Let me simply comment on the context.

There is a shift underway, post Porter, from cost-based industry policy, to knowledge-based industry policy. The focus of government attention is shifting from simple cost reduction, towards overcoming imperfections in knowledge markets, and directing public investment into immobile hard and soft infrastructure. So, while much benchmarking focuses on costs, we are now moving towards a focus on immobile infrastructures. And few can be more important for the future than the information infrastructure.

No doubt people attending the ITU appreciate the importance of extending this kind of national performance comparison, to the broader information infrastructure. And it is heartening to see that so many people around the world are grappling with the same problems. But we should not underestimate the difficulties involved.

Finally, it must be obvious from this discussion that the work we are doing in Australia would simply not be possible without the efforts of the ITU, the OECD and many of the other organisations represented here. I thank them for their contribution to our work. And I thank you for your attention.

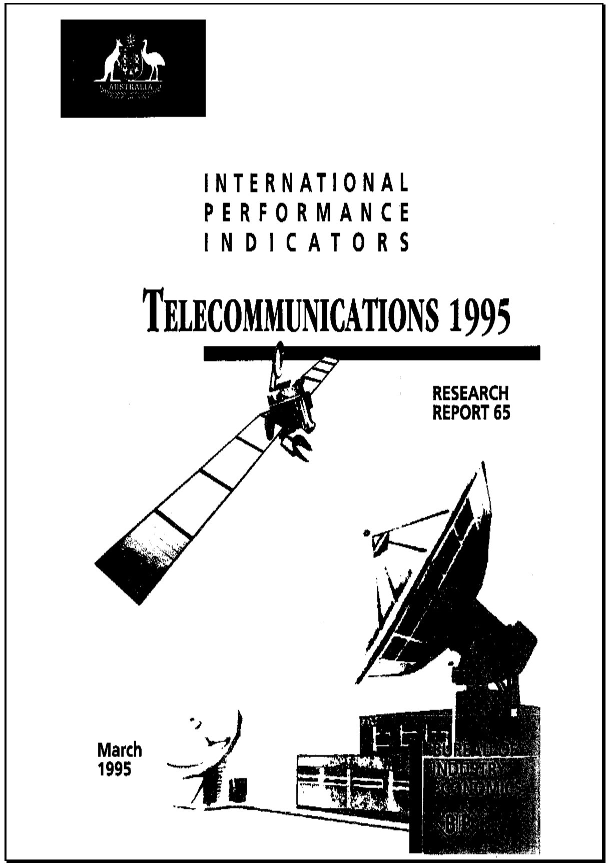
Country Policy Use of International Telecommunications Performance Indicators in Australia

Dr John W. Houghton
Principal Economist
Bureau of Industry Economics
Australia

http://www.das.gov.au/~dist/bie/bie-home.html

International Performance Benchmarking

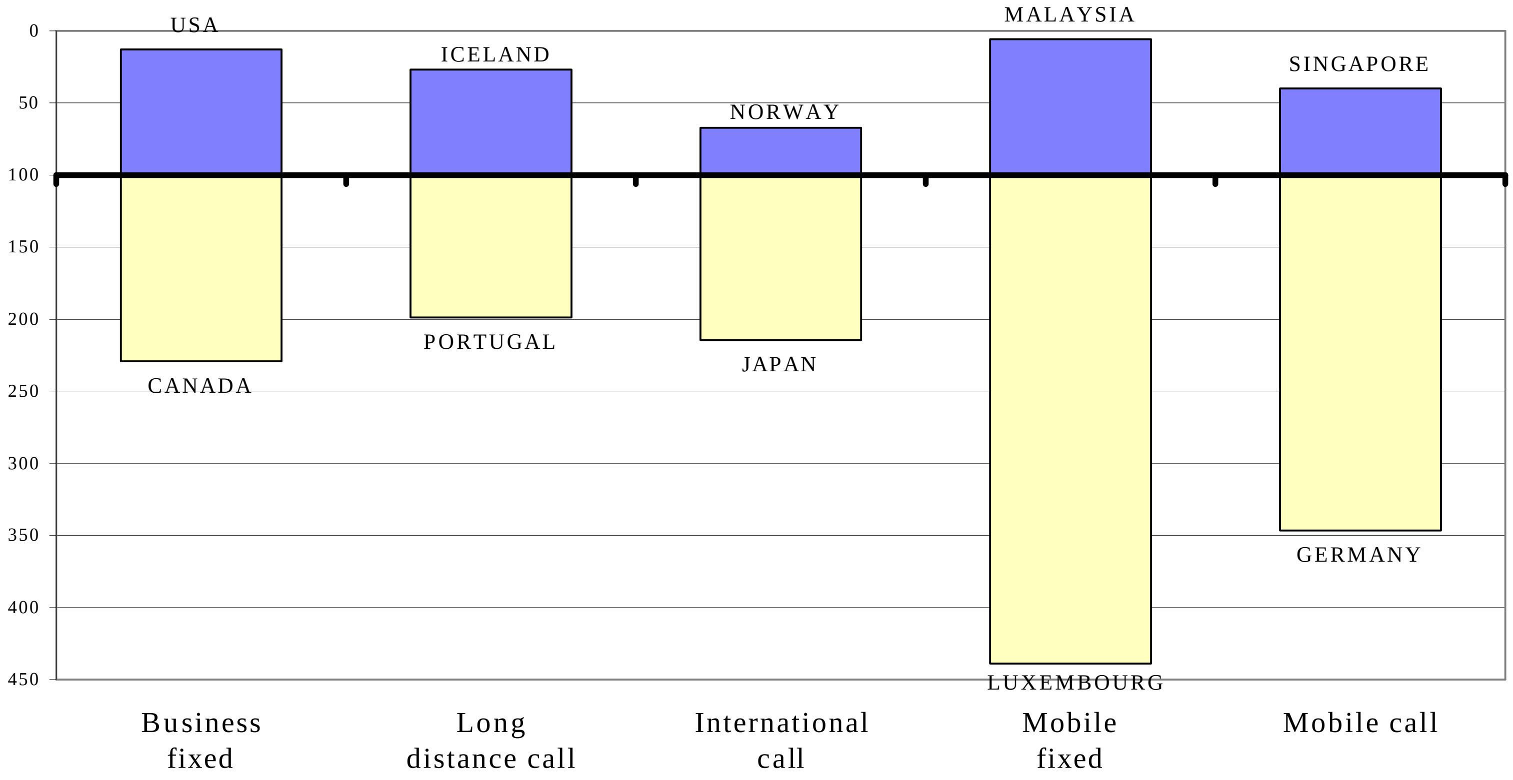
- identify the importance of infrastructure services
- develop relevant measures for international comparison
- publish performance comparisons



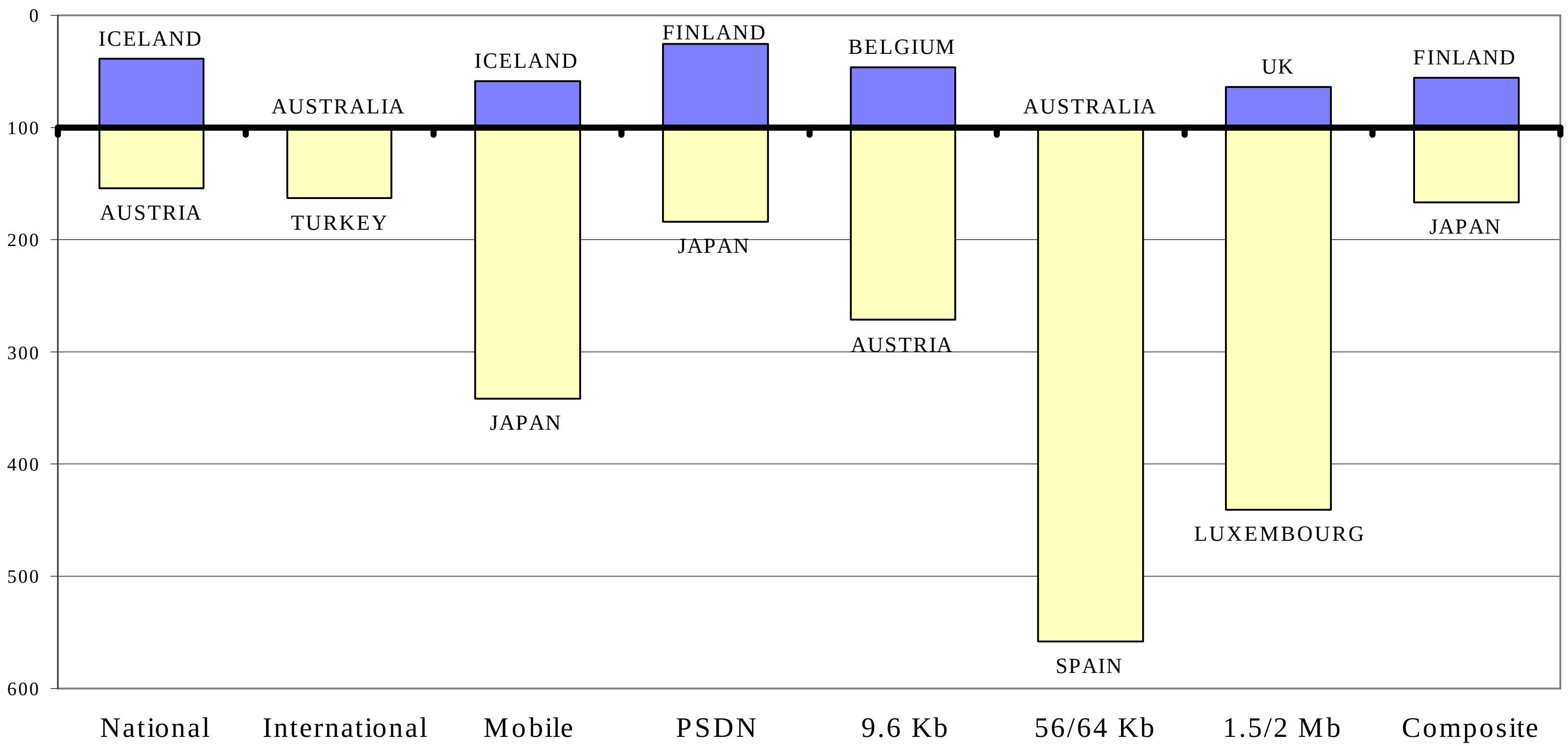
International Performance Indicators: Telecommunications 1995

Available at
http://www.das.gov.au/~dist/bie/bie-home.html

Simple Rate Comparisons (1993-94)



Tariff Basket Comparisons (1994)



Discount Baskets (Australia's OECD ranking, 1994)

	Undiscounted	*Discounted*	*Discount (%)*
Small Business	**14**	**13**	**6.4**
Medium Business	**14**	**13**	**7.7**
Large Business	**14**	**11**	**10.1**

Time Series (1990-94)

	Australia	*OECD Average*	*Competitive*	*Non-competitive*
National Business Basket	**-8.9%**	**-15.3%**	**-21.6%**	**-12.0%**
International Calls	**-28.4%**	**-34.5%**	**-**	**-**
Mobile Basket	**-26.3%**	**-20.6%**	**-31.4%**	**-16.9%**

Price Comparison Issues

- multi-player, multi-layer markets
- private and variable discounts
- class and regional discounts
- regulatory differences
- data for Asian countries
- the operating environment

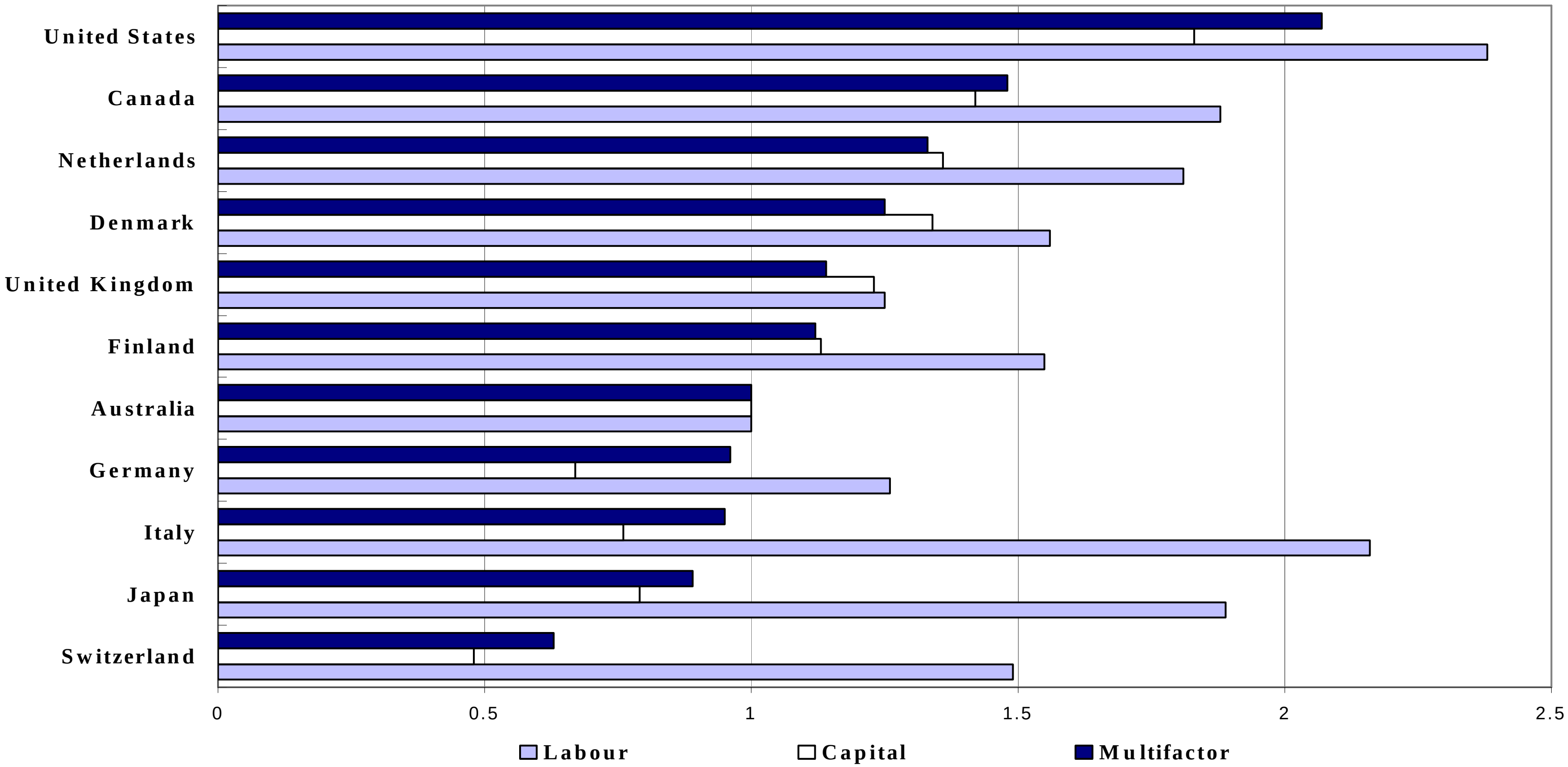
Quality of Service and Innovation

	Year	*Best Observed*	*Worst Observed*	*Australia Ranked*
IDD Completion Rates	**1992**	**US**	**Greece**	**15th of 24**
Fault Clearance	**1992**	**Netherlands**	**Taiwan**	**15th of 19**
Mobile Penetration	**1994**	**Sweden**	**Turkey**	**8th of 30**
Digitalisation	**1993**	**Hongkong**	**Austria**	**23rd of 30**
Fibre Deployment	**1990-92**	**Sweden**	**Canada**	**6th of 12**
Itemised Billing	**1992**	**Canada/France**	**Denmark**	**5th of 13**

Quality of Service Comparison Issues

- **customer surveys - complements not substitutes**
- **corporate user statistics under utilised**

Multifactor Productivity, Ranked (1992)



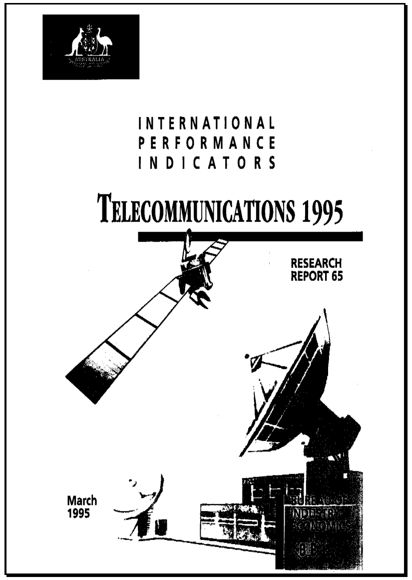
Operational Efficiency Comparison Issues

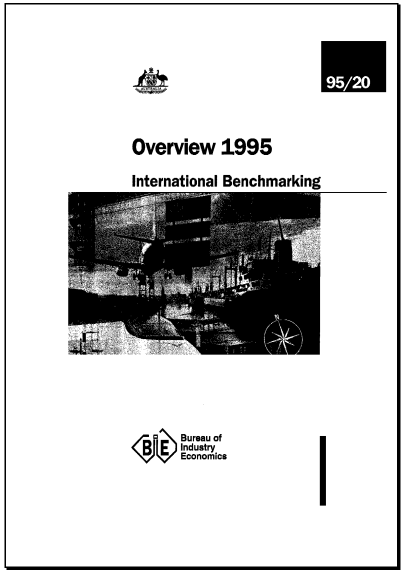
- value of capital stock
- comparing like with like
- economies of scale
- economies of scope
- the ‘channel’

Summary

- competition & discounts
- the operating environment
- customer perceptions
- the value of capital stock

MODELING OPERATIONAL EFFICIENCY





The work we are doing in Australia would not be possible without the efforts of the ITU, OECD and others

Reports, a transcript of this presentation, information and news are available from

Bureau of Industry Economics

http://www.das.gov.au/~dist/bie/bie-home.html

S.7: Managing Statistics

Session 7: Managing Statistics

What are the issues involved in maintaining and disseminating telecommunication statistics? Which statistics should be collected, how can they be stored in a computer system, how can reports be generated? What about the role of the Internet for disseminating information?

“Electronic statistics dissemination & ☆STARS☆“
M.B. Vinci Gigliucci, ITU

“Disseminating information via the Internet”
Bob Shaw, ITU

Wednesday
20 March

<u>Workshop 2:</u> Telecom Statistics Database

A tutorial on the key statistics to collect, ideas for storing and disseminating the data.

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

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Original: English

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(Geneva, 19 - 21 March 1996)

SOURCE: ITU, Maria Beatrice Vinci Gigliucci

TITLE: WORLD TELECOMMUNICATION INDICATORS DATABASE ON ☆STARS☆
(only description of the Database)

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WORLD TELECOMMUNICATION INDICATORS

DATABASE ON DISKETTE

(3rd Edition, 1996)

The *World Telecommunication Indicators Database on diskette* contains annual time series data for the period 1960-1995 for around 100 communications statistics covering telephone network size and dimension, other services, quality of service, traffic, staff, tariffs, revenue and investment. Selected demographic, macro-economic and broadcasting statistics are also included on the diskette. See the attached list showing the statistics contained on the diskette. Data for over 200 economies are available. Notes explaining data exceptions are also included.

The data are collected by the Telecommunication Development Bureau (BDT) annual questionnaire. Additional data are obtained from reports of telecommunication ministries, regulators and operators and from ITU staff reports. In some cases, estimates are made by ITU staff; these are noted on the diskette.

This electronic publication uses the World Bank's Socio-economic Time series Access and Retrieval System (✰STARS✰). This software operates on IBM PC compatible microcomputers. Users can select and retrieve any combination of countries, indicators and years for rapid display on the screen or extraction to Lotus, Excel or ASCII text file formats for further processing by spreadsheet or other packages. A user guide is included with the diskette as are the definitions of the time series.

Subscribers to the yearly package will receive 1995 data as it becomes available throughout the year. They will also benefit from on-going updates and revisions of the data. The subscribers with Internet mail addresses will automatically be mailed electronic files on a continuous basis. Subscribers without Internet addresses will receive a diskette each quarter. All subscribers are entitled to BDT Information Systems reference services such as clarification of data, sources and methodology used.

ANNUAL TIME SERIES

TELEPHONE NETWORK
Main telephone lines in operation
Main lines per 100 inhabitants
Main telephone lines in largest city
% of automatic main lines
% of digital main lines
% of main lines equipped for direct int'l dialling
% of households with a telephone
% of residential main lines
% of urban main lines
Connection capacity of local exchanges
Telephone sets
Estimated facsimile machines
Public pay phones
  Coin-operated pay phones
  Card-operated pay phones
  Public call offices
International telephone circuits
Waiting list for main lines
Number of local telephone calls
Number of national long distance telephone calls
International outgoing telephone traffic (calls)
International outgoing telephone traffic (minutes)
International incoming telephone traffic (minutes)
% of telephone faults cleared by next working day
% of unsuccessful local calls
Telephone faults per 100 main lines
Total kilometre of fibre optic cable in network

TARIFFS
Residential telephone connection charge
Residential telephone connection charge (US$)
Business telephone connection charge
Business telephone connection charge (US$)
Residential telephone monthly subscription
Residential monthly telephone subscription (US$)
Business telephone monthly subscription
Business telephone connection charge (US$)
Cost of three minute local call
Cost of three minute local call (US$)
Analog cellular connection charge
Analog cellular connection charge (US$)
Digital cellular connection charge
Digital cellular connection charge (US$)
Analog cellular monthly subscription charge
Analog cellular monthly subscription charge (US$)
Digital cellular monthly subscription charge
Digital cellular monthly subscription charge (US)
Analog cellular 3 minute call
Analog cellular 3 minute call (US$)
Digital cellular 3 minute call
Digital cellular 3 minute call (US$)

MOBILE
Cellular mobile telephone subscribers
  Analog cellular subscribers
  Digital cellular subscribers
Radio-paging subscribers

TELEX, TELEGRAM
Telex subscribers
International outgoing telex traffic (minutes)
National telegrams
International outgoing telegrams

DATA
ISDN subscribers
ISDN basic rate interface subscribers
ISDN primary rate interface subscribers
Leased circuits
Videotex subscribers
Public data network subscribers
Circuit switch data network subscribers
Public packet data network subscribers
Estimated modems in use
Number of Internet networks
Number of personal computers

EMPLOYMENT
Total full-time telecommunications staff

DEMOGRAPHY, MACRO-ECONOMY
Population
Population of largest city
% of urban population
Households
Gross domestic product (GDP)
Gross domestic product (US$)
Gross Fixed Capital Formation (GFCF)
National currency per US$ (end of year)
Average annual exchange rate (local currency p.US$)
Exports of telecommunication equipment (US$)
Imports of telecommunication equipment (US$)
Consumer Price Index (1987=100)

TELECOM FINANCE
Total telecommunication service revenue
Telecom revenue (US$)
  Income from telephone service
  Income from telegram
  Income from telex
  Other telecom income
Total telecom expense
  Operating costs
  Depreciation
  Net interest paid/(received)
  Taxes on telecom income
  Other costs
Net profit / loss
Total telecom investment (capital expenditure)
Telecom investment (US$)

BROADCASTING
Radio receivers
Television receivers
Television households
Cable television subscribers
Estimated DTH satellite receivers

INTERNATIONAL TELECOMMUNICATION UNION

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INFORMATION SYSTEMS UNIT

Document WTIM96/28-E
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SOURCE: ITU, Robert Shaw

TITLE: DISSEMINATING INFORMATION VIA THE INTERNET

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Disseminating Information via the Internet

Robert Shaw

Information Services Department

International Telecommunication Union

Robert.Shaw@itu.ch

Overview

- What is the Internet?
- Internet Jargon
- Connecting to the Internet
- Serving Info on the Internet
- Tips for Countries in Early Stages of Internetworking
- Some relevant Links

What is the Internet? Competing Definitions

- Protocols: “a set of interconnected computer networks using the protocol TCP/IP”
- Applications: “email, file transger (FTP), World Wide Web”
- Resources: “hundreds of thousands of electronic sites representing collective human knowledge

Internet Jargon

- Domain Name System: user-friendly names masking Intenet routing addresses
  – Example: “ www.itu.ch”
  – Last part is “ top level domain”
  – In most countries, Top Level Domains (TLD) are ISO country codes (e.g., .fr, .ch, .mx)
  – Other TLDs exist (e.g.m .com, .org) typically used in the US

Internet Jargon

- URL: Uniform Resource Locator - identifies Internet network resources for WWW
  - Compsed of protocol, domain name and file name
  - Example: “http://www.itu.ch/WTDR95” is the URL for 1995 ITU World Telecommunication Development Report

Internet “Admin” Bodies Jargon

- ISOC: Internet Society at http://www.isoc.org
- IETF: Internet Engineering Task Force at http://www.ietf.cnri.reston.va.us
- IANA: Internet Assigned Naming Authority at http://www.isi.edu/div7/iana
- Internic: provides non-country specific doman name registration (e.g., “.com”) at http://rs.internic.net

World Wide Web

- Application “Esperanto” of the Internet
- HTML (Hypertext Markup Language) is coding technique to make hypertext documents displayed in WWW browsers (e.g., Netscape)
- URLs embedded in HTML files used to create hypertext links to other WWW sites

Connecting to the Internet

- Very easy in some countries, very very difficult in others (LDCs)
- For " access" only - (WWW, send/receive email), recommend commercial online companz (Microsogt Network, Compuserve, AOL)

Tips for Countries in Early Stages of Internetworking

- Technical training at annual “INET” conferences - email ISOC VP for Education (Georges.Sadowsky@nyu.edu)
- Network Startup Resource Center - provides free toolkits to set up Internet connectivity at http://www.msrc.org/
- Thousands of tools available online - see http://www.itu.ch/CWSApps/cwsa.html

Tips for Countries in Early Stages of Internetworking

- Find out who (if anyone) is controlling “top level domain” (TLD) management for your country (as last resort, email Jon Postel, Director of IANA at postel@isi.edu)
- If there are trademark names you want to protect, register domain names both under .COM and your countr code (now!)

Serving Info on the Internet

- To be simple info provider (create, post WWW pages) requires specialist expertise & service provider that allows you to “post” WWW pages (latter not necessary if you have direct Internet connection)

Serving Info on the Internet

- However “indicators = database” so ideal is to directly interface WWW server to database (requires even more specialist expertise)
- Direct database <-> WWW Server interface typically requires you to have direct Internet connection

Serving Info on the Internet

- If database in desktop tools (e.g., Access, Excel), suggest using Microsoft NT Internet Information Server (free at http://www.microsoft.com)
- If database in SQL (e.g., Oracle), suggest using Netscape Server (http://home.netscape.com)

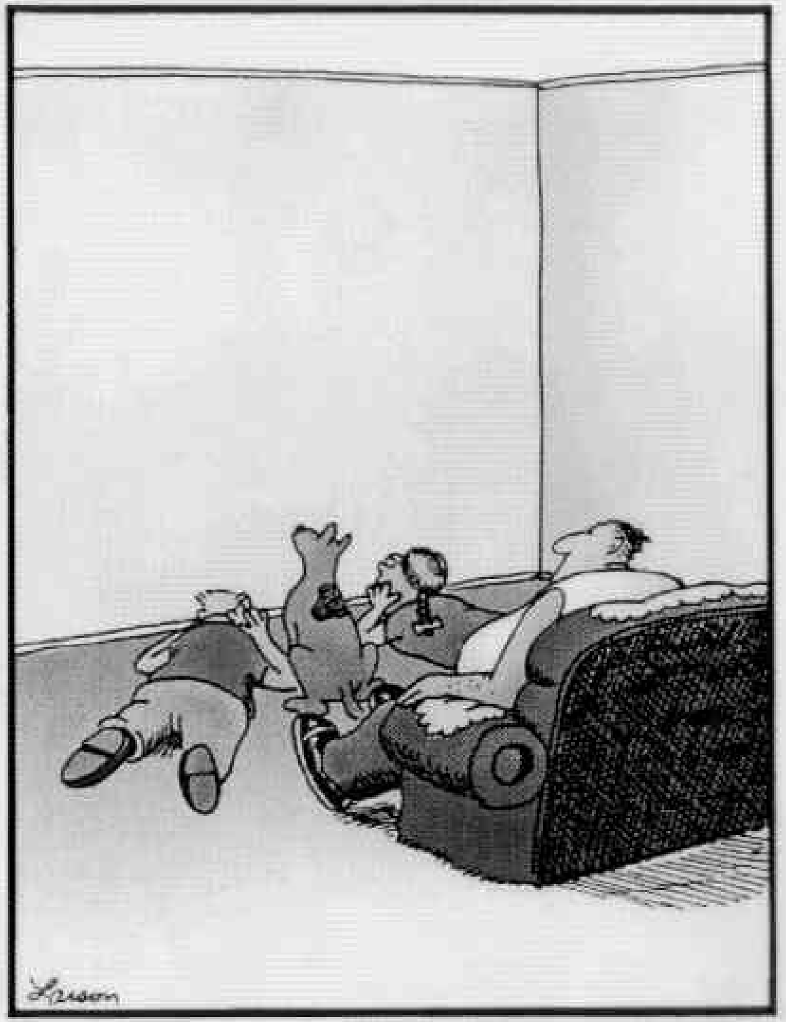
Some Telecom & Indicators Links

- Telecom Information Resources on the Internet: http://www.spps.umich.edu/telecom/telecom-info.html
- WWW Library Communications & Telecommunications: http://www.analysis.co.uk/commslib.htm
- ITU: http://www.itu.ch
- OECD: http://www.oecd.fr
- Statistical Office of the European Communicties: http://www.cec.lu/eurostat.html
- World Bank: http//www.worlbank.org/
- Great Search engine: http//www.altavista.digital.com/

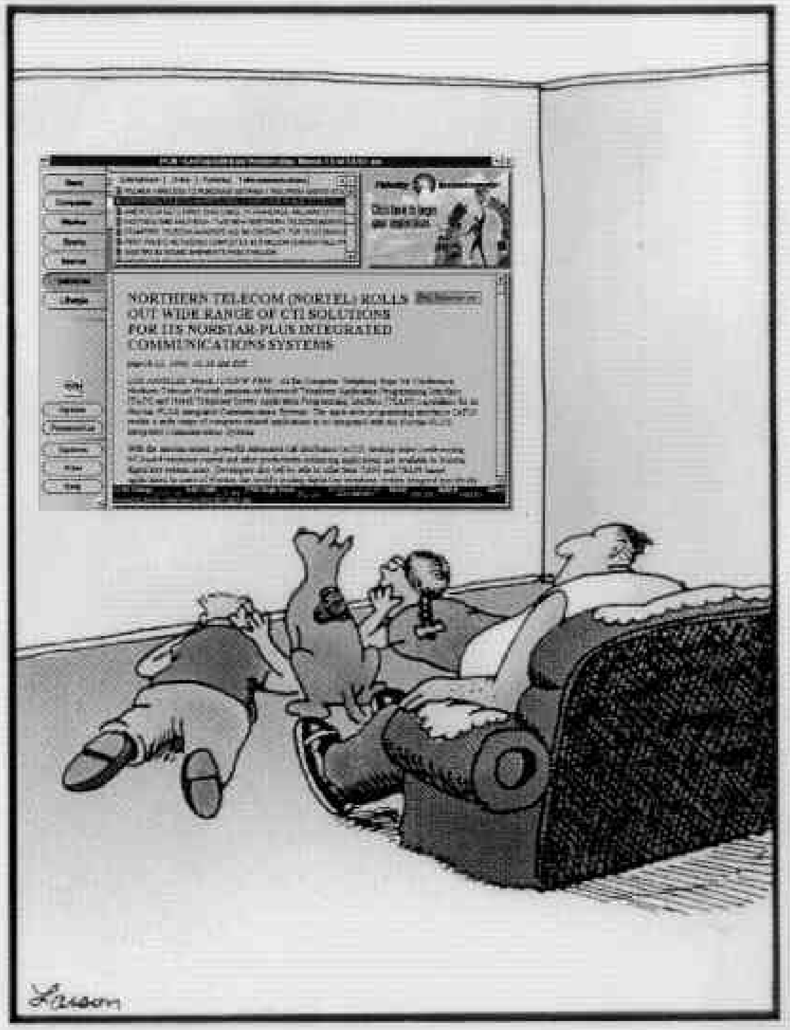
Internet Indicators

- Matrix Information and Directory Services at http://www.mids.org
- Also see “What is the Internet?”: see http://www.mids.org/what.html
- World Wide Web consortium discussing demographic information at http://www.w3.org/pub/WWW/Demographics

Questions?



In the days before television



after
In the days ~~before~~ television

Session 8: Involving National Statistical Agencies

To date, very few national statistical agencies have collected telecommunication statistics. The task has been left to ministries, operators or regulators. What actions can be taken to incorporate telecommunication statistics into national statistical frameworks? Who is the best placed to collect and aggregate statistics for the country?

"Revision of National Accounts"
Olle Gardin, Eurostat

"North American ITT Classification"
F. Gault, Statistics Canada

Thursday
21 March

INTERNATIONAL TELECOMMUNICATION UNION

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SOURCE: EUROSTAT, Olle Gardin

TITLE: EUROPEAN TELECOMMUNICATION STATISTICS

World Telecommunication Statistics

European Telecommunication Statistics

National Telecommunication Statistics

Why European Telecom Statistics?

To

- formulate
- manage
- monitor
- evaluate and assess

EU telecom related policies

For

- assessment of the European markets
- National use

EU telecom policies concern e.g.

- the regulatory framework
- regional policies
- the internal market
- GATS

The Statistical Office of the European Communities

Tasks:

- to provide reliable and comparable official statistics
- to ensure a common statistical language within the EU

Aim:

to create common classifications, methods and organizational structures for compiling comparable statistics on the EU Member States

Eurostat does not collect statistical data itself.

Mostly receives them in aggregated form from the Member States

COINS

Aim:

to develop an European system for statistics on telecommunication, computer and information services.

Content:

- development of a system for data collection, incl. variables, definitions and classifications, guidelines for the data collection

- development of a database, incl. the system for dissemination and publishing of data

- the legal framework

Telecommunication Statistics

What does it mean?

4 Policy oriented aspects

A Infrastructure/Networks

B The Telecom Industry

C (The telecom service)

D.1 The Demand/Use of Telecom Services

D.2 Telecom (and IT) as a basis for new business concepts, products, services

Domains of Variables

A Data on Infrastructure

B .1 Structural data

B .2 Enterprise data

C .1 Data on Volume/Traffic

C .2 Data on Quality

C .3 Data on Prices/Costs

C .4 International Trade

D Data on Demand/Use

Comparisons of Telecom Statistics

- between countries
- over time

The System of National Accounts (SNA) is the overall framework

Supply

Production + Imports

=

Demand

Intermediate consumption + Final consumption + Exports

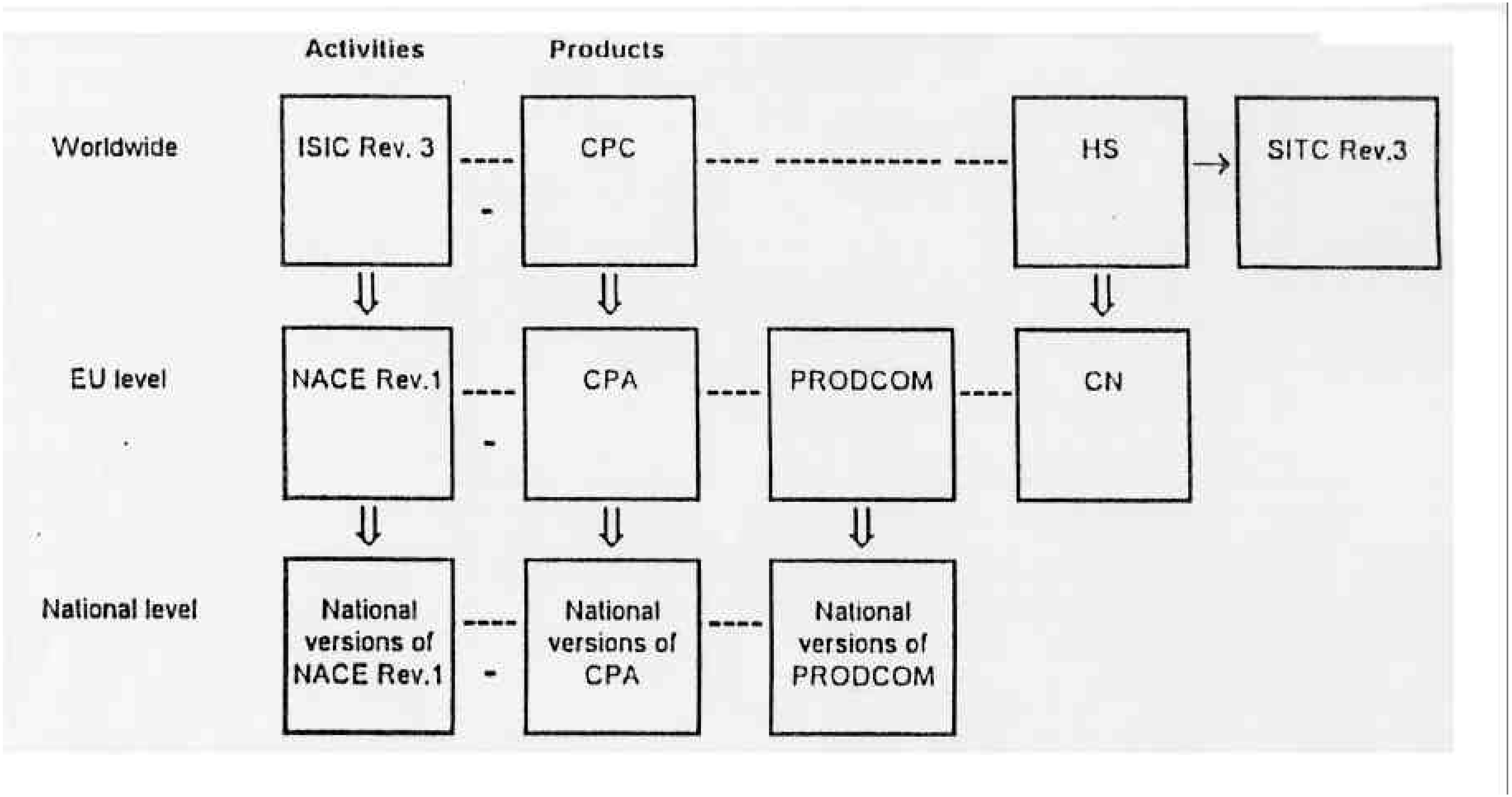
Input - Output

Satellite accounts

A general framework for the supply and demand of telecommunication services:

Supply	Demand							
	Intermediate consumption				Final consumption			
	Industry 1	Industry 2	Industry 3 -	Industry n	House-holds	Public sector		Exports
Industry 1 service a -”- b -”- c								
Industry 2 service a -”- c								
Industry 3- service a -”- b -”- c								
Industry n service b								
Imports service a -”- b -”- c								

Revised system of integrated statistical classifications: overview



Definitions, Nomenclatures

Economic activities	NACE Rev. 1,	ISIC rev. 3
Products		
(Goods and Services)	CPA,	CPC
(Goods)	Prodcom,	SITC rev. 3, HS
Occupations, Professions		ISCO
Education		ISCED

ITU Telecommunication Indicators
Handbook etc.

Level of detail

Period(icity)

Units of measurements

Telecommunications- and Broadcasting Services

- Fixed Network Telecommunications Services
- Mobile Telecommunication Services
- Interconnection services
- Communications Management Services
- Value Added telecommunication Services
- Broadcast Services
- Radio and Television Cable Services

International Telecommunication Union
World Telecommunication Indicators
1996

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European Telecommunication Statistics

Abstract

This paper gives an overview of the activities and considerations that shape the development of European statistics on telecommunications. As the statistical tools for describing the manufacturing and trade with telecommunication equipment are fairly well developed, the presentation is focused on the development of statistics on telecommunication services

The needs for telecommunication services statistics are discussed and four domains of information needs, eight domains of variables and comparability are identified as strategic elements. Against the background of competition being introduced on the markets for telecommunication services the balance between the need for transparency and information and the need for confidentiality is discussed. The classification of industries, services and other, e.g. concerning networks, are presented and the crucial role of the development of classifications of telecommunication services is underlined.

After a short overview of the current statistical situation the development of European statistics is touched upon. A framework for the economic statistics on telecommunication services is given and the more important elements of the COINS project for developing the statistics, are described. They are classification of telecommunication services, a pilot survey, confidentiality issues and international co-operation. The paper ends with asking why National Statistical Institutes should be involved and puts forward an answer.

European telecommunication statistics

Introduction

The telecommunication services markets are in a phase of dynamic development and expansion due to technological, commercial and regulatory changes. The United States, Japan, Canada and the European Union have all launched information society initiatives. Their goal is to connect people, businesses, schools, universities, libraries, hospitals to a world-wide network which will be part of a Global Information Society. The telecommunications networks are seen as the basic foundation for the information society.

From monopoly to competition

The general trend is to go from monopolies to competition. This process has different speed and is differently advanced in different parts of the world. For the European market it has been agreed that full service competition, including voice telephony, will be introduced by the 1 January 1998. Five countries have been allowed a derogation: Luxembourg to the year 2000 and Spain, Greece, Ireland and Portugal to 2003.

The telecommunication services have also been included in the GATS/WTO agreement.

A competitive situation requires market information

The development of the telecommunication services and markets at both national, European and world level requires timely and accurate information on the trends in the marketplace and this information is needed by all parties including authorities and regulators, operators and service providers, customers or users, professional organizations, researchers etc.

Equal competition will be stimulated and promoted by a core of well-defined, harmonised statistics accessible on equal terms to all players on the market.

Development of European statistics on services

The Council Decision of 18 June 1992 (92/326/EEC) established a programme for the development of European statistics on services. The objectives of this programme are

a) to set out a European reference framework for statistics on services defining the most appropriate concepts and methods for managing and monitoring Community policies, especially the implementation of the Single European Act, and for satisfying the possible needs of national, regional and local administration, international organizations, economic operators and professional associations;

b) to establish a European statistical information system for services;

c) to promote and support harmonisation of statistics on services in the Member States without, however, needlessly increasing the burden on undertakings.

It is also said in the Council Decision that the methodological reference framework will increase the comparability of data between the different service sectors and the various Member States, despite the fact that service activities vary from one country to the other because of different practices and legal systems. The methodological framework will be used as the basic harmonisation tool for the development of official European statistics on services and as a recommended framework for non-official statistics, particular for market research.

Eurostat

Eurostat is the statistical office of the European communities. Its tasks are to provide reliable and comparable official statistics and to ensure a common statistical language within the EU.

The means to achieve this are to create common classifications, methods and organisational structures for compiling comparable statistics on the EU Member States.

Normally Eurostat does not collect statistical data itself. It receives them in aggregated form from the Member States.

The regular working partner in Member States is the National Statistical Institutes. Because of the special features of telecommunication services also the regulatory authorities have been involved.

User needs

What the user needs in every single case is of course depending on the problem, question or issue that he is to tackle. But at the centre are statistics on the telecommunications industries and products. This means that he needs statistics on industries manufacturing and trading with telecommunication equipment and on industries supplying and trading with telecommunications services.

Normally, he also needs statistics on the telecommunications infrastructure and the demand or use of telecommunications.

As the statistics on the manufacturing and trade with telecommunication equipment are fairly well developed and poses less problems than statistics on telecommunications services this paper is focused on the telecommunications services.

Four domains of information needs
From the issues raised in the different policy domains and information demands from users four main information domains of interest have been identified. They are

A. The telecommunication networks or infrastructure.

B. The telecommunication services industry

(C. The telecommunication services)

D. 1 The demand or use of telecommunications services
D.2 ICT and information as basis for new business concepts, products and services

The telecommunications services is indicated here as they are the results of the activities in the telecommunication services industry, They can be measured both from the supply side, in which case the data refer to the industry domain, and the demand side, in which case they refer to the demand or use domain.

Domains of variables
When finalised the COINS (Communication and Information Statistics) data base should offer relevant quantitative and qualitative statistical information necessary for policy considerations and decisions related to the telecommunications services sector. Therefore the criteria for selection and definition of the statistical variables of COINS has to take their bearings primarily from the key policy issues and not from the current data availability.

Key policy issues concern the telecommunications regulatory framework, the internal market, regional policies, social and economic cohesion, competition, transeuropean networks, industry, external trade and GATS/WTO etc.

Only part of the information needs related to the policy issues can be satisfied by statistical variables which show the economic weight and the structure of the telecommunications services sector. User requirements are largely concentrated on special service markets, i.e. On information about the volume of supply and demand and about prices. This is true for the bulk of information needs expressed by the economic operators on the internal market and it includes also information on (services) products which are highly competitive or complementary.

From the policy domains and the information domains a list of eight domains of variables can be derived, They are

A. Data on infrastructure

B. 1 Structural data
B.2 Enterprise data

C. 1 Data on volume/traffic
C.2 Data on quality
C.3 Data on prices/costs
C.4 Data on International trade

D. Data on demand/use

Comparability
A fundamental user requirement is that the statistics are comparable over time and between countries. To be able to provide such statistics it is necessary to develop and agree on classifications, definitions and concepts to be used. It is also necessary to agree on units of measurements and other guidelines for the data collection. Very important is to agree on and be explicit on the point in time to which the measurements refer and the time period the measurements refer to.

Balance between the needs for information and confidentiality

For an effective and fair competition on the Internal market and on the global markets the transparency of the markets should be increased. The small actors on the market has a claim for "equal" information. Detailed information accessible to all players on the market on equal terms will benefit the market and those trying to enter it. At the same time the operators on the market have a just claim to keep sensitive business information secret.

It is necessary to find a proper balance between the legitimate interest of the incumbent operators to protect their investments etc. and the equally legitimate need for authorities, potential new players on the market and the users of telecommunication services to make it possible to get a clear picture of the development in this essential sector.

There is a lack of common understanding of what should be confidential and a lack of awareness even among regulators about what kind of information should be made available. It is therefore crucial to reach a balanced agreement among the different concerned parties on what data should be provided for the compilation of statistics and that all the operators contribute on equal terms.

It is important to bear in mind that the question of confidentiality has different dimensions for the data collection and for the dissemination and publication of the data.

The confidentiality issues have to be appropriately taken into account. It is particularly the confrontation of user requirements with feasibility, including the response burden and the balance between the need for transparency of the market and the need for confidentiality for business reasons that will be decisive for setting priorities.

Classifications

There are two main types of classifications used in economic statistics: industry classifications and product (services) classifications. The two types have different uses; the industry classification is used to classify data concerning turnover, value-added, employment, investment etc., i.e. information relating to the economic enterprise or unit. The product classification is used for information on production and trade.

For both types of classifications there exist world-wide systems managed by the United Nations Statistical Office. They are the International Standard Industrial Classification (ISIC Rev.3), the Central Product Classification (CPC) and Standard International Trade Classification (SITC Rev.3). On the EU-level there are the NACE Rev.l, i.e. the industrial classification of economic activities in the EU, and CPA, Central Product Classification according to Activity. On the national level there are national versions of Nace Rev. 1 and CPA.

Classification of industries

An enterprise is classified according to its main activity, i.e. the production process or product sold on the market, that represents the greatest part of its activities. It is very frequent that an enterprise have more than one activity. This is the reason why we talk about primary and secondary activities. It is also usual that enterprises produce for internal use and thus do not sell the product on the market. This is called own-account production.

In order to get information on the total supply and market one should have information not only on the special industry but also on secondary activities in other industries and ownaccount activities.

To describe the precision achieved in the statistics on an industry one talks about the *homogeneity* of an industry and the *coverage* of the industry. With homogeneity is meant the part of an industries total output that is made up of that industry's characteristic activity. With coverage is meant the share of the total production of a product that is produced by the industry whose characteristic activity is the production of that product.

The EU Industrial Classification NACE Rev.1

In NACE Rev.1 exists only one code, 64.2, for telecommunications services. Due to the technological, commercial and regulatory developments telecommunications, broadcasting and computing are converging. This implies that there probably is a considerable amount of telecommunication services that will not be covered be a survey of enterprises classified in NACE Rev. 1 6.2.

The classification of services

The crucial point in developing the statistics on telecommunications services is to develop and establish a classification of telecommunications services. Without a relevant classification of the services it will not be possible to breakdown revenues or spending according to services and thus not possible to follow the development of the different telecommunication services markets.

The telecommunication services have to be defined in a way that takes into account the rapid growth of new services led both by the liberalisation and the technological evolution. This means that the challenge is to find a classification level that is broad enough to be stable over some time while at the same time describing meaningful and relevant market segments.

Other classifications

Special classifications and definitions concerning the networks, quality of service and other "functional" variables have to be established. In order to ensure comparability between statistics on the global market and to minimise the burden on member states of data collection these classifications and definitions should be harmonised as far as possible with the definitions and classifications developed and used by international organisations, e.g. the 1TU Telecommunication indicator handbook.

The present statistical situation

To-day there is a fundamental shortage of data and statistics enabling us to follow and analyse the fast developing and growing telecommunications sector. The normal situation in the Member States of the European Union is that there is a shortage of good statistics on services in general. In the case of telecommunication services statistics are almost non existent in the NSIs.

International Telecommunication Union (ITU), and the Organisation for Economic Co-operation and Development (OECD) as well as Eurostat collect, compile and publish statistics on telecommunication services: traffic, infrastructure, operators, prices.

What is missing is statistics on the enterprises. The big operators are fairly well covered but not the small service providers. There are no statistics with a breakdown of the revenues according to services and very little information on the demand or use of telecommunication services. And the statistics that exist covers the public services and not the private networks, which will be an increasing shortcoming in the coverage.

On the other hand it is obvious that there exist a lot of relevant data from unofficial and private sources. These data are more and less well defined and their definitions often change between years in order to capture what is topical. They are often limited in their geographical coverage and refer to different points in time or different periods. It is not always clear what enterprises or services they cover or what methods are used. The results are not always possible to relate to other general economic statistics.

For these reasons it is not feasible to bring together a consistent and coherent set of statistics on telecommunication services that are comparable over time and between countries on the basis of these data.

But they exist and are used by administrations and operators on the markets. They should also be used and thereby evaluated in the process of developing and publishing adequate official statistics.

As the official statistics never can be so extensive and detailed that they cover every user need, market research and other private data will always be needed. But they should be collected and compiled in such a way that they are compatible with the official statistics, e.g. by using the same or more detailed but compatible classifications and concepts. In this way they give more value to the user/buyer of the data than if they are "stand alone" data.

As mentioned above, the Council Decision on the development of European statistics on services says that "the methodological framework will be used as the basic harmonisation tool for the development of official European **statistics on services** and as a recommended framework for non-official statistics, particularly for market research.

Development of the European statistics

In order to improve this situation, Eurostat has launched a project to develop and implement an European statistical system on telecommunication services. It is called COINS - Communications and Information Statistics.

Concerning the economic statistics on telecommunication services a general reference framework for the development is shown in the following simple illustration along the lines of the national accounts system. What is shown is a methodological framework and it does not imply that all the corresponding data will be collected in reality.

A general framework for the supply and demand of telecommunication services:

Supply	Demand						
	Intermediate consumption				Final consumption		
	Industry 1	Industry 2	Industry 3 -	Industry n	House-holds	Public sector	Exports
Industry 1 service a -"- b -"- c							
Industry 2 service a -"- c							
Industry 3- service a -"- b -"- c							
Industry n service b							
Imports service a -"- b -"- c							

The COINS project

The objective is to develop a system consisting of

- a set of variables with definitions and guidelines for the collection of data
- a database with data of good quality structured in a user friendly way
- a dissemination system corresponding to user needs and
- eventually the necessary legal arrangements.

The more important elements of this project is described in the following.

Classification of telecommunication services

A proposal for a classification of telecommunication services has been drafted and sent to the EU Member States for comments. The proposal consists of seven categories and thirty sub categories. The proposed seven categories in which the telecommunication services market is divided are

- Fixed network telecommunication services	(10 Sub categories)
-Mobile telecommunication services	(8 “-)
- Interconnection services	(1 “-)
- Communications management services	(4 “-)
- Value added telecommunications network services	(4 “-)
- Broadcast services	(2 “-)
- Radio and television cable services	(1 “-)

Pilot survey of telecommunication services enterprises

Eurostat is planning a pilot survey to be carried through in Member States in 1997. The objectives of the pilot survey are twofold:

- to test the developed methodology and the feasibility of the proposed data collection so as to prepare for a regular data collection on the telecommunication services sector.
- to start collection of information for statistical and analytical purposes.

The planned survey comprises data on

- when the enterprise started
- employment
-operating revenues, with a detailed breakdown of the revenues according to the proposed classification of telecommunication services
- revenues from sale of goods and services related to telecom and other operating revenues
- breakdown of revenues by category of customers
- exports and imports of telecommunication services
- breakdown of operating cost
- purchase of goods for resale
- investments, disposals and new leasing contracts

Confidentiality issues

The confidentiality issues have to be tackled as said above. It is necessary to come to a common understanding between the different concerned parties like data providers, users and the statistical agencies.

International co-operation

In order to ensure that the European telecommunication services statistics will be harmonised and co-ordinated with the international and world-wide statistics it is necessary with a close co-operation with international organisations like ITU, OECD, United Nations and the so called Voorbourg Group

Why involve the National Statistical Institutes?

A first observation when considering this question is that, in one form or other, there is a National Statistical Institute in all countries, not only in the European Union, but all over the world. In some countries the production of national statistics is centralised to the NSI, in other is the production decentralised. At the same time the NSIs do not collect and compile telecommunication services statistics.

Normally it is the task of the NSIs to provide basic statistics like population statistics and national accounts. They also have a co-ordinating and harmonising role, which means that they are responsible for the nomenclatures and classifications. This implies that NSIs are the natural bodies to turn to for developing and compiling statistics comparable over time and between countries.

The NSIs are involved in extensive international co-operation and have established stable organisational structures for that. To ensure that the telecommunication statistics will be comparable and consistent on and between the National, European and other regional levels and the world level the NSIs should be involved..

The Statistical Institutes have also long experiences and established routines for coping with confidentiality and security related to the collection and storage of data.

A regulation on the transmission of confidential data to Eurostat was adopted by the Council in June 1990 as Regulation 1588/90. It authorises National Authorities to transmit confidential data to Eurostat while obliging Eurostat to take all necessary measures for their protection. In January 1994, these measures have been defined and formally adopted by the Member States through the Committee on Statistical Confidentiality.

To get the NSIs involved is also to some extent a guarantee for a continuity in the provision of basic telecommunication services statistics and that these statistics will be integrated in the general economic statistics via the statistical tools like classifications, business registers, methods, concepts and definitions used.

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

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WORLD TELECOMMUNICATION INDICATORS 1996
DAY 3, SESSION 1: INVOLVING NATIONAL STATISTICAL AGENCIES

INDUSTRIAL CLASSIFICATION AND DATA COLLECTION

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- INTRODUCTION
- THE IMPORTANCE OF INDUSTRIAL CLASSIFICATION
- INDUSTRY OR COMMODITY?
- DATA COLLECTION
- CONCLUSIONS

1. INTRODUCTION

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- TELECOMMUNICATIONS STATISTICS
- CLASSIFICATION
- COLLECTION

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- WHAT IS AN INDUSTRY?
- HOW ARE INDUSTRIES GROUPED
- POLICY IMPLICATIONS

NORTH AMERICAN INDUSTRIAL CLASSIFICTION SYSTEM (NAICS)

INFORMATION

CANADA	INFORMATION AND CULTURAL INDUSTRIES
MEXICO	INFORMACIÓN EN MEDIOS MASIVOS
UNITED STATES	INFORMATION

INFORMATION AND CULTURAL INDUSTRIES

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XX INFORMATION SERVICES AND DATA TRANSACTION PROCESSING SERVICES

XX BROADCASTING AND TELECOMMUNICATIONS INDUSTRIES

XXX	RADIO AND TELEVISION BROADCASTING
XXXX	RADIO BROADCASTING
XXXX	TELEVISION BROADCASTING
XXX	PAY TV, SPECIALTY TV AND PROGRAMME DISTRIBUTION
XXXX	PAY AND SPECIALTY TELEVISION
XXXX	CABLE AND OTHER PROGRAMME DISTRIBUTION

XX BROADCASTING AND TELECOMMUNICATIONS INDUSTRIES (CONTINUED)

XXX TELECOMMUNICATIONS

XXXX WIRED TELECOMMUNICATIONS CARRIERS

XXXX WIRELESS TELECOMMUNICATIONS CARRIERS - EXCEPT SATELLITE

XXXX SATELLITE TELECOMMUNICATIONS

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INTERNATIONAL STANDARS

COMMON QUESTIONS

INTERNATIONAL TELECOMMUNICATION UNION
WORLD TELECOMMUNICATION INDICATORS 1996
GENEVA, SWITZERLAND MARCH 19 - 21, 1996
DAY 3, SESSION 1: INVOLVING NATIONAL STATISTICAL AGENCIES

INDUSTRIAL CLASSIFICATION AND DATA COLLECTION FOR TELECOMMUNICATION INDUSTRIES

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Abstract:

This paper reviews the role of the national statistical agency in defining telecommunication industries, collecting data, and disseminating information on the industries. A case is put for national statistical agencies, working with international organizations, to provide comprehensive and internationally comparable data to support public policy debate on telecommunications and the societal impact of the rapid change in these and other industries.

February 1996

1. INTRODUCTION

This paper reviews the role of the national statistical agency in defining telecommunication industries, collecting data, and disseminating information on the industries. National statistical agencies are responsible for maintaining national industrial classifications and commodity classifications and they contribute to work on international classifications. This means that they define the industries about which data are collected.

Once the industries are defined, there is a need to collect sufficient financial information to allow the estimation of Gross Domestic Product for the industry. There is also a need for information on the quantity and value of commodities produced to support the development of price indices which can be used for deflation and the estimation of real change over time of the financial characteristics of the industries.

National statistical agencies, working with international organizations, are well placed to provide comprehensive and internationally comparable data to support public policy debate on telecommunications and the societal impact of the rapid change in these and related industries. This information is complementary to that gathered by regulators, policy ministries and private sector information providers.

2. STATISTICAL AGENCIES

National statistical agencies are just one player in the business of data collection. There are the national regulators, policy ministries, and private sector information providers and, not least, the telecommunications firms themselves. Then there are the co-ordinating efforts of the international organizations, such as the Organization for Economic Co-operation and Development (OECD), and the International Telecommunication Union(ITU), and the supranational European Union(EU) with its statistical agency, Eurostat.

Statistical agencies, by their nature, are at arms length from policy, regulatory and commercial interests. However they are bound to measure economic and social activity and publish the results to inform public discourse. In the case of Statistics Canada, this is stated in Section 3(a) of the Statistics Act where the duties of the Agency are[1]:

> "to collect, compile, analyse, abstract and publish statistical information relating to the commercial, industrial, financial, social, economic and general activities and condition of the people;".

This gives the Agency both a broad range of opportunities, and also responsibilities, to report on economic and social activity.

The telecommunications industries, and those with which they are converging, are changing society and the nature of work in the society. They are providing new opportunities for commerce, and, they are reducing the significance of the boundaries of nation states. This makes telecommunications and related industries key areas for new measurements, and not just for on-going measurement of the provision of conventional service.

3. TELECOMMUNICATION STATISTICS

3.1 Telecommunication Carriers Industry

At Statistics Canada, statistics on telecommunications carriers have been collected and published since the Agency was created in 1918[2]. The first data published in Canada go back to 1886, just 10 years after Alexander Graham Bell made the first local and long distance telephone calls.

Statistics currently published present both financial and physical data on the activity of Canadian telephone companies. They reflect the needs of the Canadian System of National Accounts (SNA) and the interests of the industry which are, to some extent influenced by the regulator, the Canadian Radio-Television and Telecommunications Commission(CRTC).

The SNA brings together data on economic activity across the economy to produce Gross Domestic Product by industry and region, price indices, gross fixed capital formation, labour and trade figures. Through the input-output tables, data on intermediate inputs are linked to production. It is the SNA which provides the integrating framework for economic statistics and it is, from time to time, revised. The most recent revision was released in 1993[3].

The industry and policy makers are also interested in the penetration of telecommunication services and this has given rise to data on the number of exchange and toll lines and on access lines and type of service provided. More recently, there have been surveys of resellers and of providers of cellular telephony, but this is just a beginning of plans to broaden the coverage of the surveys.

As competition increases, more firms are liable to enter the industry and the surveys have to take this into account. As services proliferate, there is a need to know how revenue is distributed across these services, if price indices are to be constructed, and there is also strong policy interest, on the part of Industry Canada, in the extent to which businesses are using the services in order to become more competitive.

While the regulatory framework and services offered are changing, there is also pressure to take advantage of relaxed regulation to provide the services by different means. The obvious examples are cable companies providing telephone services and telephone companies providing video services, a change which has yet to occur in Canada.

3.2 Broadcasting

The collection and publication of statistics on radio and television and cable television are well established in Canada. The surveys are supported by Statistics Canada, the CRTC and the relevant policy department, Canadian Heritage. The advantage of this is that the questionnaires serve three purposes: they satisfy the needs of the SNA; they are the annual return required by the regulator for renewal of licensing; and, they collect information on programme content for use in cultural analysis.

The collaboration between the regulator, the policy department, and the statistical agency is a model for how data can be collected with minimum burden and maximum utility. It contrasts with the data collection on telecommunication carriers where the regulator and the statistical agency act separately. While this specific issue could be addressed, there is the radical change taking place in the industries that requires more immediate action if current economic activity is to be well estimated. This raises the question of how an industry is defined.

4. CLASSIFICATION AND COMPARABILITY

4.1 Classification Systems

For statistical purposes, an industry is defined in the context of an industrial classification. How an industry is defined is important as once the definition is adopted, it is used to collect, publish and analyse all of the information on financial stocks and flows, on employment, and commodities produced and other items, like technologies used. The definition determines the size of the industry through its contribution to GDP and, as a consequence, its impact for lobbying purposes when industry representatives deal with governments.

While it is necessary to know about the characteristics in individual countries, for domestic industrial, social and cultural policies, it is also useful to know how the domestic industries behave in relation to those in the countries of trading partners. The means available to do this is the United Nations International Standard Industrial Classification (ISIC)[4], currently in its third revision (ISIC.3). Within the EU, there is the General Industrial Classification of Economic Activities within the European Communities (NACE)[5] which is in its first revision (NACE.1). Both are hierarchical classifications and both agree at the higher levels of aggregation, NACE.1 being the more detailed.
Industrial classifications are widely used by national governments and international organizations and their evolution over many years has led to anomalies. As economies change, industrial classifications are revised in an attempt to reflect this change and then statistical agencies and the users of the data have to deal with changes in definitions and coverage.

4.2 NAICS

In North America, Canada, the US and Mexico are in the process of adopting a common industrial classification, the North American Industry Classification System(NAICS). This will provide comparable classification over the North American free trade area, while still permitting individual countries to collect information at a greater level of detail than is found in NAICS. As with NACE.1, the detail, once aggregated, supports comparison with ISIC.3 classification.

In the case of the NAICS which is to be used by Canada, Mexico and the US starting with the reference year 1997, a decision was taken to develop the systems within a particular conceptual framework which is elaborated in issues papers available from the US Bureau of Economic Analysis[6]. In brief, an industry can be characterized by what is produced (consider chairs as an example), or by the production process used to produce a particular product (metal chairs are different from plastic chairs). There are advantages to each approach but economists have a preference for a classification that deals with a common means of production as this facilitates the analysis of productivity. As well, if the classification is based on the production process, information on the 'chair industry' can still be produced if industrial surveys ask for financial information for a list of commodities produced. When there are answers to a question on the percentage of revenue derived from the sale of chairs in questionnaires from the plastics, metal and wood industries, the results can be aggregated to produce information on chairs.

With this framework in mind, the NAICS deliberations gave rise to a new collection of industries grouped into the Information and Cultural Industries Sector. In NAICS, the Sector is the highest level of aggregation and it is divided into Sub-Sectors, Industry Groups and Industries. Each country can then elaborate a fifth level to meet its national needs.

The Information Sector is given in detail in the Appendix, and here only the part related to broadcasting and to telecommunication carriers is presented.

XX BROADCASTING AND TELECOMMUNICATIONS INDUSTRIES

XXX	Radio and Television Broadcasting
XXXX	Radio Broadcasting
XXXX	Television Broadcasting
XXX	Pay TV, Specialty TV and Program Distribution
XXXX	Pay and Specialty Television
XXXX	Cable and Other Program Distribution
XXX	Telecommunications
XXXX	Wired Telecommunications Carriers
XXXX	Wireless Telecommunications Carriers, except Satellite
XXXX	Telecommunications Resellers
XXXX	Satellite Telecommunications
XXXX	Other Telecommunications

The points to note are that each industry has a principal means of delivering its service, by wire, wireless(with or without satellite), or by buying wholesale and selling retail. The technologies used are not part of the classification for the purpose of economic statistics. However, if the policy interest were technology use, or innovation, such questions could be addressed to respondents in these industries and the answers used, along with financial data to address the policy question.

5. INDUSTRY OR COMMODITY?

5.1 Commodities

In the NAICS, there is no 'multi-media' industry or 'voice mail' industry. If such data are required, they have to be collected as commodities sold by the industries. Once the data are gathered, statistics can be developed on the penetration of voice mail, by region.

Once the commodity dimension is introduced, questions about commodities can be addressed to those who supply them and to those who use them. The former case leads to a national picture of voice mail production, while the latter can show which industries in which regions are using voice mail to become more competitive. As well, the use statistics can be classified by size of business to study different propensities to use the commodity by small- and medium-sized firms. Greater policy focus on the use of telecommunication services, and their effect on jobs and competitiveness, make the development of indicators of use[7] increasingly more important.

5.2 Convergence

The use of commodity questions can also identify the rate at which convergence is taking place once cable companies in Canada are permitted, for example, to provide telecommunication services. Surveys can then identify the rate at which the commodity, voice mail, is growing, and which industries are providing it and which using it. Of course, once there is an understanding of the infrastructure, in this case 'voice mail', the next question is how often is it used, and why. The linking of transactions to infrastructure is a subject of on-going study[8]. Once there are measures of infrastructure and frequency of transaction, the next step is to measure the impact of the activity on jobs and growth. This sets the stage for a policy discussion on convergence and its societal impacts.

6. DATA COLLECTION AND COMPARABILITY

6.1 Data

Once industries and commodities are defined, the data have to be collected. Here statistical agencies have some advantages over other institutions. They may have the legal power to compel response and they are seen to be removed from commercial interest and able to protect the confidentiality of the data of individual respondents. Responding to a questionnaire from a statistical agency may be seen at best as a contribution to the public good and, at worst, as necessary act, like the paying of taxes.

Regulators will have different data interests than statistical agencies and less of a commitment to publishing time series and making their information widely available to the public. They also have an effective means of achieving compliance: no response, no license. However, with changes in regulation from 'rate of return' to 'price cap' controls, the information required by the regulator may decrease.

Policy ministries, industry associations and private sector data gatherers also have different interests from statistical agencies.

6.2 Model Surveys

The information to be collected on industries is not just of national concern and, increasingly, there are efforts to set international standards. An example is the work of the Voorburg Group[9].

The Voorburg Group is a group of statisticians from national statistical agencies which has worked on behalf of the UN for the last ten years on developing commodity classification for service industries, including telecommunication services. Model surveys have been developed as a means to test commodity classifications, and the model survey of computer services is an example[10]. Once it was developed by the Voorburg Group, it was adopted by the UN Statistical Commission for use by member countries. There is a draft model survey of telecommunication services[11] which, if it is adopted, will become a world guideline for data collection.

6.3 International Co-ordination

A standard questionnaire, applied in many countries, eases the task of data comparison and the work of such agencies as Eurostat and the OECD. The Conference of European Statisticians(CES), under the auspices of the United Nations Statistical Commission and the Economic Commission for Europe, plays a co-ordinating role in reviewing the work programmes of Eurostat and the OECD.

7. CONCLUSIONS

National statistical agencies define the industries that are included in their national industrial classification systems and they contribute to the development of international classification systems, of industries and of commodities. They are also responsible for collecting financial, labour and other data on the industries and reporting the information, using the SNA, or other frameworks. Data on production and use, on labour characteristics, and on technologies can be combined to examine the societal impact of change in telecommunication industries and those related through convergence.

International organizations provide a means of standardizing measures and of comparing information from different countries and making comparisons of use to policy makers and to the industries. This information is complementary to that gathered by regulators, policy ministries and private sector information providers. However, it is essential to the public policy debate.

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APPENDIX: INFORMATION INDUSTRIES

National Titles

	Information and Cultural Industries	in Canada
	Informacion en Medios Masivos	in Mexico
and	**Information**	in the United States

NAICS STRUCTURE

INFORMATION AND CULTURAL INDUSTRIES

XX PUBLISHING INDUSTRIES

XXX Newspaper, Periodical, Book and Database Publishing
XXXX Newspaper Publishing
XXXX Periodical Publishing
XXXX Book Publishing
XXXX Database Publishing
XXXX Other Publishing Industries

XXX Software Publishing
XXXX Software Publishing

XX MOTION PICTURE AND SOUND RECORDING INDUSTRIES

XXX Motion Picture and Video Industries
XXXX Motion Picture and Video Production
XXXX Motion Picture and Video Distribution
XXXX Teleproduction and Other Post-production Services
XXXX Motion Picture and Video Exhibition
XXXX Other Motion Picture and Video Industries

XXX Sound Recording Industries
XXXX Record Production Companies
XXXX Integrated Record Companies
XXXX Music Publishing
XXXX Sound Recording Studios
XXXX Other Sound Recording Industries

XX BROADCASTING AND TELECOMMUNICATIONS INDUSTRIES

XXX Radio and Television Broadcasting
XXXX Radio Broadcasting
XXXX Television Broadcasting

XXX Pay TV, Specialty TV and Program Distribution
XXXX Pay and Specialty Television
XXXX Cable and Other Program Distribution

XXX Telecommunications
XXXX Wired Telecommunications Carriers
XXXX Wireless Telecommunications Carriers, except Satellite
XXXX Telecommunications Resellers
XXXX Satellite Telecommunications
XXXX Other Telecommunications

XX INFORMATION SERVICES AND DATA AND TRANSACTION PROCESSING SERVICES

XXX Information Services
XXXX News Syndicates
XXXX Libraries and Archives
XXXX Other Information Services

XXX Data and Transaction Processing Services
XXXX Data and Transaction Processing Services

Relationship to ISIC

The objective of defining industries that relate to a single 2-digit category of the International Standard Industrial Classification of all Economic Activities (ISIC, Revision 3) of the United Nations is largely met. Twenty-six of the twenty-nine proposed NAICS industries are contained within Divisions 22 - Publishing, Printing and Reproduction of Recorded Media, 64 - Post and Telecommunications, 72 - Computer and Related Activities and 92 - Recreational, Cultural and Sporting Activities of ISIC. The following NAICS industries cannot be assigned to an ISIC division without being subdivided: Other Publishing Industries, Radio Broadcasting and Television Broadcasting. However, the discrepancies between these proposed NAICS industries and ISIC are minor and do not have a significant impact on the comparability of data.

Achievement of Objectives

The proposed classification structure meets the objectives for the North American Industry Classification System in that it is comprised of industries that group establishments with similar production processes and achieves comparability for the three participating countries. The NAICS structure also introduces a number of new and emerging industries, particularly in the sound recording, broadcasting, telecommunications and information services industries.

Session 9: Convergence

The growing convergence of the telecommunications, computing and broadcasting industries makes it increasingly difficult to segregate each sector statistically. What is the global information industry and how is it defined? What kind of statistics are collected in the related data processing and broadcasting industries?

"G-7 International Inventory Project"
M. Okumura, MPT, Japan

"The Observatory Approach"
EITO

"Covering high-tech industries"
OMSYC, Paris

Thursday
21 March

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION DEVELOPMENT BUREAU

INFORMATION SYSTEMS UNIT

Document WTIM96/31-E
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World Telecommunication Indicators Meeting
(Geneva, 19 - 21 March 1996)

SOURCE: MPT (Japan), Makiko Okumura

TITLE: GLOBAL INVENTORY AND INTERNATIONAL TELECOMMUNICATIONS INVENTORY

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GLOBAL INVENTORY AND INTERNATIONAL TELECOMMUNICATIONS INVENTORY

MAKIKO OKUMURA

Ministry of Posts and Telecommunications
JAPAN

OUTLINE

1 G7 Ministerial Ministerial Conference on the Information Society

2 Results of the G7 Conference

3 G7 Pilot Projects--Global Inventory Project

4 Proposal of new initiatives to ITU

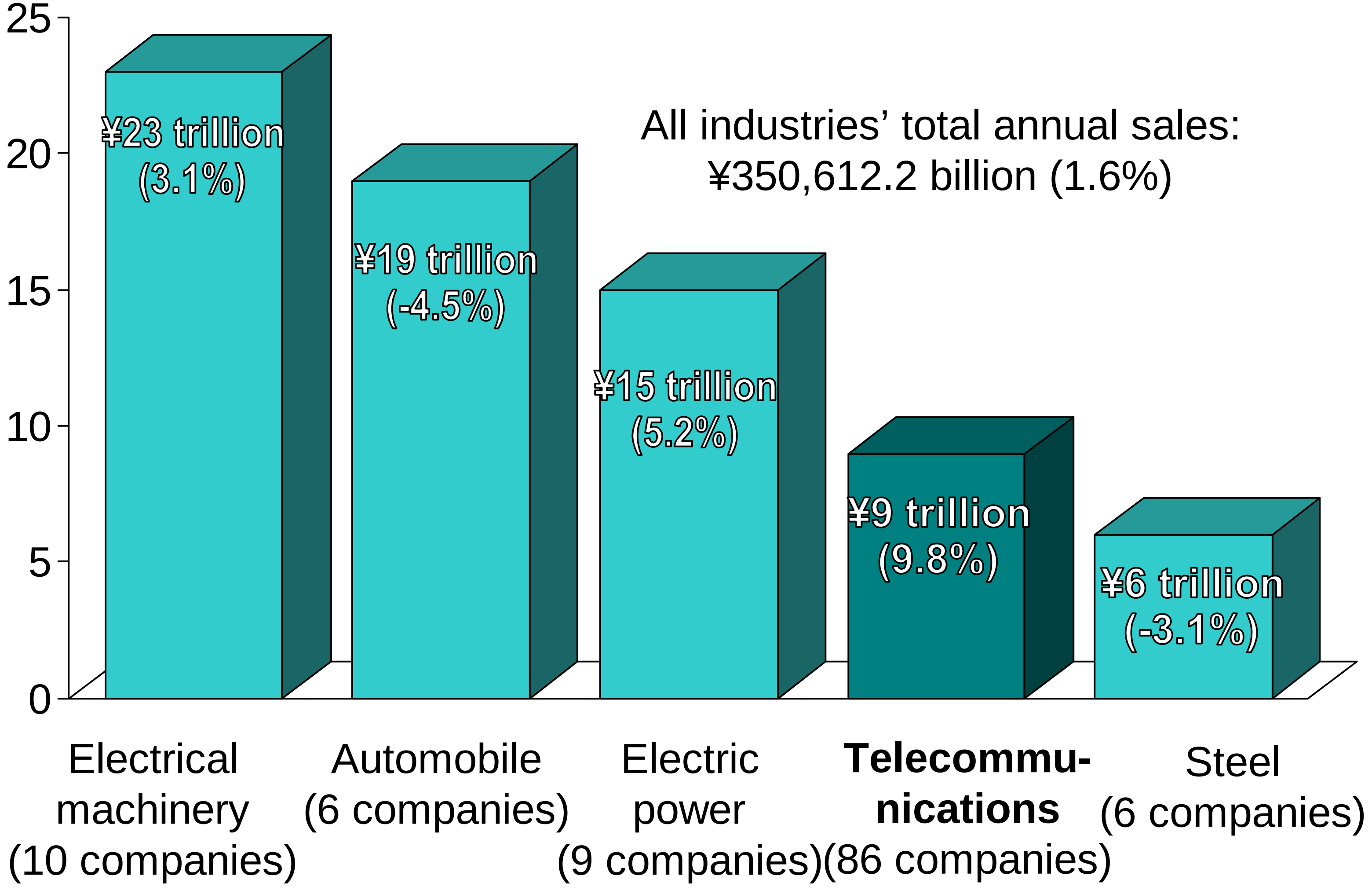
G7 MINISTERIAL CONFERENCE ON THE INFORMATION SOCIETY (February, 1995)

-BACKGROUND-

1 View on the Role of Telecommunications

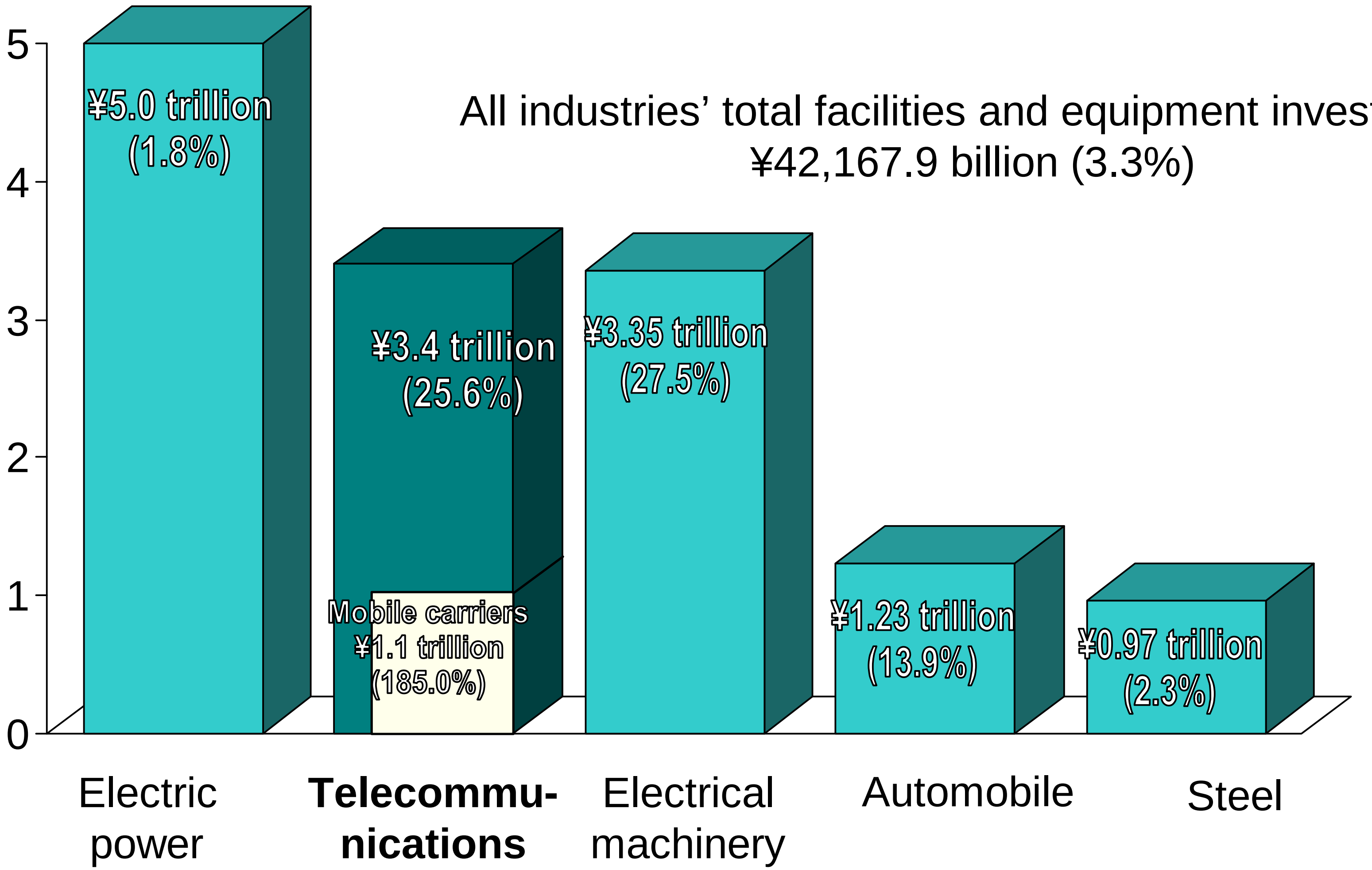
- Leading Industry in the 21st Century
- Most Important infrastructure of any industries
- Effective for solving problems at a global level

1. Market size of Type I telecommunications business (FY94 financial results)



Note: Parenthetical figures indicate annual growth rates.

1. Facilities & equipment investments by Type I telecommunications businesses



Note: Parenthetical figures indicate annual growth rates.

Results of the First Info-Communications Reform

(1985)

1. Entry of many new carriers

1985
NTT and KDD only ➡ Type I carriers: 123
Type II carriers: 2,805
(End of January 1996)

2. Rate reductions

e.g. i) Basic rate for cellular phones
¥30,000 (in 1985) ➡ ¥7,400 (in 1995)
ii) Long-distance calls
(Tokyo-Osaka, per 3 minutes, daytime on weekday)
¥400 (in 1985) ➡ ¥180 (in 1993)
(Applications for further reduction to ¥140 has been filed)

3. Diversification of services

4. Contribution to economic growth

• Market size (compared to GDP)	¥14.5 trillion (4.5%)	➡	¥25.4 trillion (5.4)%
• Capital investment (ratio to entire industry)	¥2.2 trillion (8.7%)	➡	¥3.8 trillion (9.2)%
• Employment (ratio to total number employed)	724,000 (1.2%)	➡	1,029,000 (1.6)%

5. Remarkable growth in mobile communications

e.g. Number of subscribers of cellular phones and PHS:
40,000 (in 1985) ➡ 9,380,000 (in January 1996)

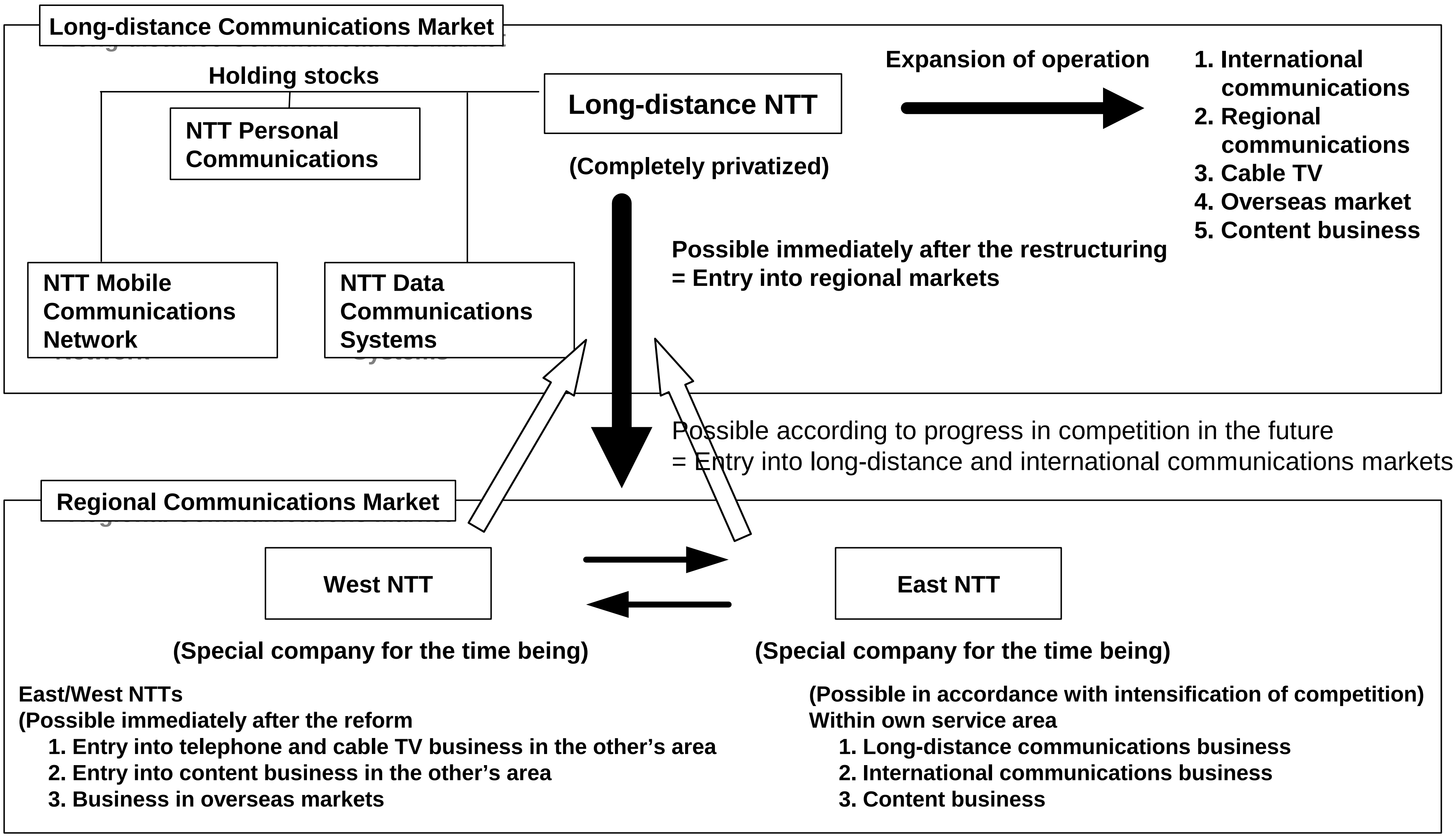
2 Common Policy Trend in Telecommunications

- Promotion of competition in telecommunications
  - Privatization of NTT
  - Discussion on the future status of NTT

- Establishment of information infrastructure of high speed and large capacity

- Development of new applications

Restructuring Scheme



Note: (1) Restructuring will be conducted by establishing or revising related laws.
(2) Restructuring measures above should be conducted with due consideration for the securing shareholder and creditor rights (tax exemption measures, exceptions to the standard for listing stocks, exception concerning concerning delivery of actual stocks).

Deregulation in Telecommunications Field

1. Market entry regulations

- Elimination of the clause on excess facilities as one of the criteria for permission to enter into the type I telecommunications business
  Premise: Establishment of new frameworks for provision of privileges concerning public utilities

2. Tariff regulations

1) Regional services (after restructuring of NTT)
   NTT: Introduction of authorization methods such as the "yard-stick" system
   Others: Shift to an advance notification system
2) Long-distance services
   After the restructuring of NTT ➡ Shift to an advance notification system
   Introduction of an incentive regulation for dominant carriers instead of present authorization system
3) International services
   Expansion of destinations by carriers other than KDD ➡ Shift to an advance notification system
   Introduction of an incentive regulation for dominant carriers instead of present authorization system
4) Mobile telecommunications
   Shift to an advance notification system

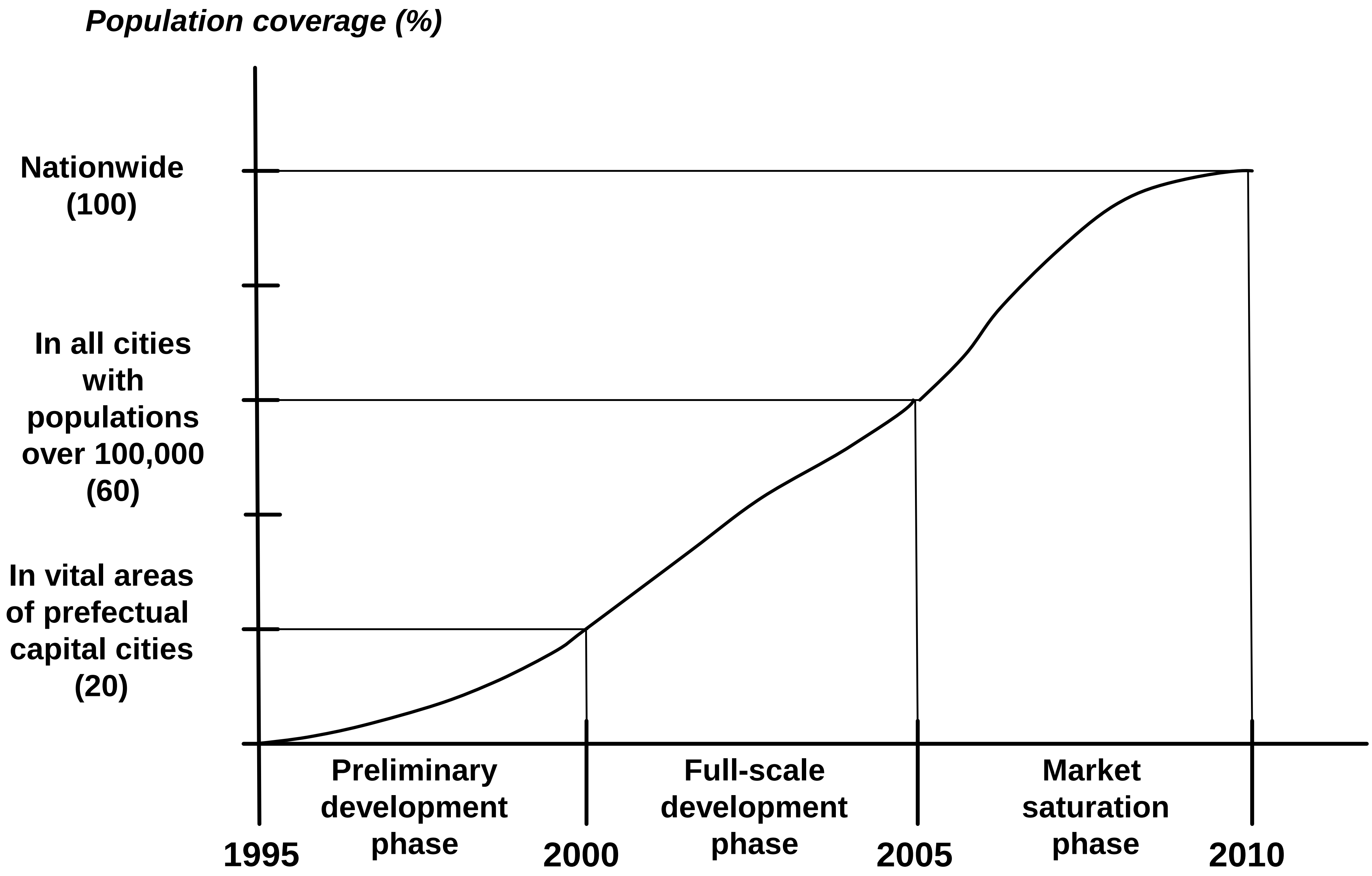
3. Leased circuits

Allowing interconnection of private leased circuits with public switched networks at both ends by the end of 1996 domestically, by the end of 1997 internationally (complete liberalization).

4. Restrictions on foreign investment

1) Based on the results of WTO negotiations, the possibility of future relaxing restriction on foreign ownership will be considered.
2) Long-distance NTT: It will receive the same treatment as other Type I carriers.
3) Regional NTT: Restrictions on foreign ownership will be relaxed according to the progress made in market competition.
4) KDD: Relaxation of restrictions on foreign investment in KDD will be considered, taking into account viewpoints for assuring national security and citizens' safety, when studying the abolition of the KDD Law.

5. Optic-fiber Network Construction Schedule



Result of the G7 Conference

(1) 8 Core Principles

- Promoting Dynamic Competition

- Encouraging Private Investment

- Defining an Adaptable Regulatory Framework

- Providing Open Access to Networks

(Continued)

- Ensuring Universal Provision of and Access to Services
- Promoting Equality of Opportunity to the Citizen
- Promoting Diversity of Content including Cultural and Linguistic Diversity
- Recognizing the Necessity of Worldwide Cooperation with Particular Attention to Less Developed Countries

(2) 6 Policies for realizing Information Society

- Promotion of Interconnectivity and Interoperability

- Development of Global Markets for Networks, Services and Applications

- Ensuring Privacy and Data Security

- Protecting Intellectual Property Right

(Continued)

- Cooperation in R&D and in the Development of New Applications

- Monitoring of the Social and Societal Implications of the Information Society

G7 Joint Pilot Projects

(1) Global Inventory

(2) Global Interoperability for Broadband Networks

(3) Cross-Cultural Training and Education

(4) Electronic Libraries

(5) Electronic Museums and Galleries

(6) Environment and Natural Resources Management

(7) Global Emergency Management

(8) Global Healthcare Applications

(9) Government On-Line

(10) Global Marketplace for SMEs

(11) Maritime Information Systems

Global Inventory

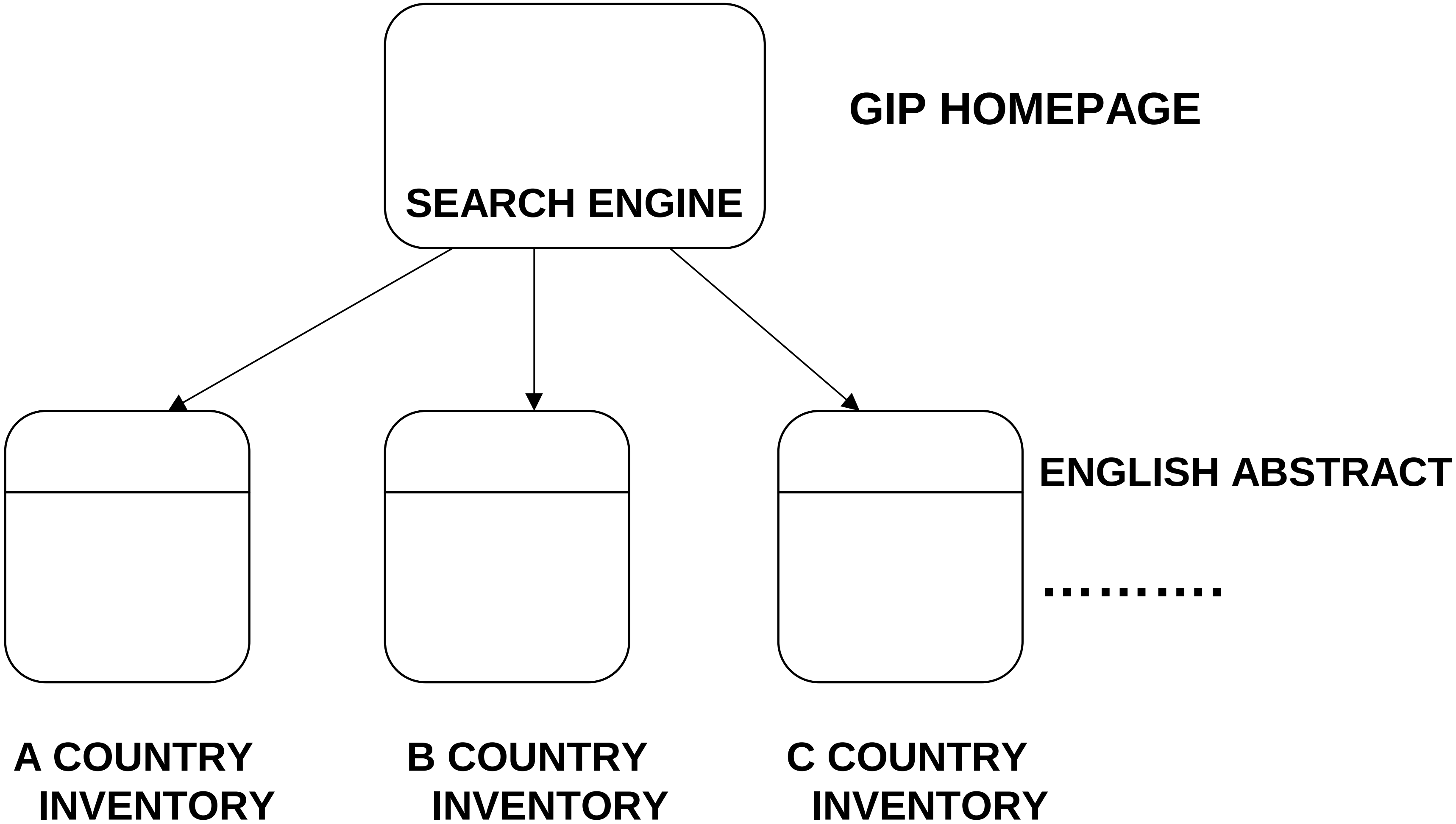
- Establishing multimedia database on activities and researches related to Information Society

- Accessible via Internet

- Decentralized system

- Open to non G7 countries and international organizations

IMAGE of ORGANIZATION of GLOBAL INVENTORY



Proposal for New Activities

(1) Linking ITU's Internet Site to Global Inventory

(2) Establishing new database of basic data on telecommunications

-- International Telecommunication Inventory

Data to be input in ITI

a. Basic facts about each country

b. Basic organization and legal systems (government organization, outline of legislation, carriers, etc.)

c. Policy and service trend (information infrastructure, new services, competition)

d. Relevant statistics

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TITLE: WHAT IS THE EUROPEAN INFORMATION TECHNOLOGY OBSERVATORY - EITO ?

ITU World Telecommunication Indicators Meeting
Geneva, 19-21 March 1996

EITO
The European Information Technology Observatory
Summary

Up-to-date and valid information plays and increasingly important role in business and political decision-making. EITO aims to support the creation of the global information society as well as to make its contribution to the further economic integration and political unification of Europe. This initiative will be continued with annual editions of the EITO handbook in March, and an EITO update in autumn.

It is an indispensable source of information in current and future developments in European information and communication technology markets, aimed at the use of all; suppliers of hardware, software, and services in the field, their customers, market analysts, scientists and technicians, media, as well as the political world and the interested public.

EITO
European Information Technology Observatory

E. Reik
German Information Technology
Manufacturers’ Association
Frankfurt/Main

Geneva, 19-21 March 1996, ITU-World Telecom Indicators Meeting

What is the European Information Technology Observatory - EITO?

- EITO is the established yearbook for the information and communications technology (ICT).
- It has set the standard for market analysis and statistics in Europe.
- EITO presents the most comprehensive data currently available about the ICT market in Europe.

EITO - a broad and unique European initiate

- EITO member are the European organisations
  - **eurobit** as representative of the information technology industry
  - ECTEL as representative of the telecommunications industry and
- the European IT trade fairs CeBIT in Hanover, SIMO in Madrid and SMAU in Milan
- The EITO is supported by the Directorate General III Industry of European Commission and by the OECD.
- EITO sponsors are the trade fair organisations Association SICOB in Paris, Kontor og Data/KDL in Oslo, Systems in Munich and Deutsche Telekom in Bonn.

The EITO - an indispensable source of information in marketing and technology for

- European ICT market players
- users of information and communications technology (ICT) hardware, software and services
- trade organisations and trade fair visitors
- market analysts
- politicians
- members of the European Commission and national government representatives in Europe and overseas organisations involves in R&D, standards and education relating to ICT
- media

EITO - Statistical Outlook

- For 16 West European countries
  - Extensive statistical outlook and forecasts on ICT markets
  - Economic background data
  - Production and trade flows, market structures, penetration, and price dynamics
- For 4 East and Central European countries
  - Extensive statistical outlook and forecasts on IT markets
- Comparison with USA and Japan
- By major product and services segments
- Coverage 1993 - 1997

EITO - Summary Section

- The views of Industry and the European Commission
- ICT market overview comments
- ICT technological trends and standards

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- Michael Beckmann, ECTEL/Siemens
- Umberto Bena, **eurobit**/Olivetti
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- Michael Rupf, **eurobit**/IBM
- Dr.. Michael Towara, **eurobit**

Some general information on the EITO

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• Price:	46.-- ECU (incl.. VAT)
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