

In search of suitable telecommunication networks for rural and remote areas

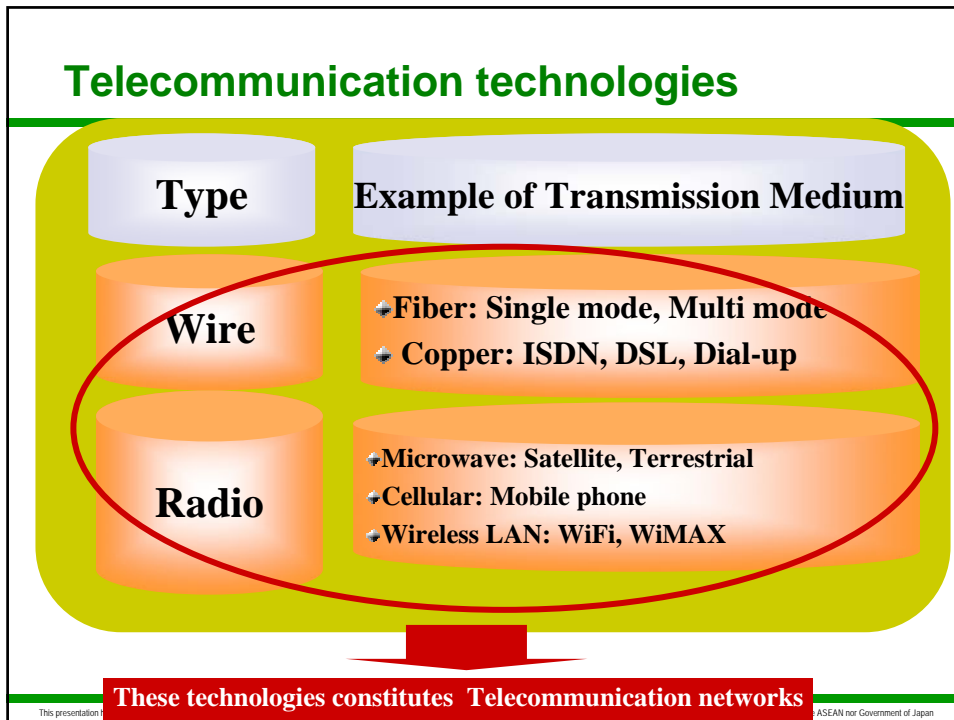
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TAU PROJECT REGIONAL WORKSHOP
"Finding Telecommunication Solution for Rural Community
Development in ASEAN Region"

Pandawa Room
Grand Mercure Hotel Yogyakarta Indonesia
7- 8 September 2007

Agenda

- Telecommunication technology
- Definition of telecommunication technology networks
- Characteristics of telecommunication technology networks
- Models
- Framework
- Inputs
- Conclusion



Telecommunication networks – Definitions -

<i>Line</i>	<i>Definition</i>	<i>Distance</i>
<i>Trunk line</i>	<i>Trunk line is Backbone Network</i>	<i>Long</i>
<i>Distribution line</i>	<i>Distribution line is the interface between Backbone and Access line</i>	<i>Middle</i>
<i>Access line</i>	<i>Access line/last one mile is the final leg of delivering connectivity from a communications provider to a customer.</i>	<i>Short</i>

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Classification of wired telecommunication technologies

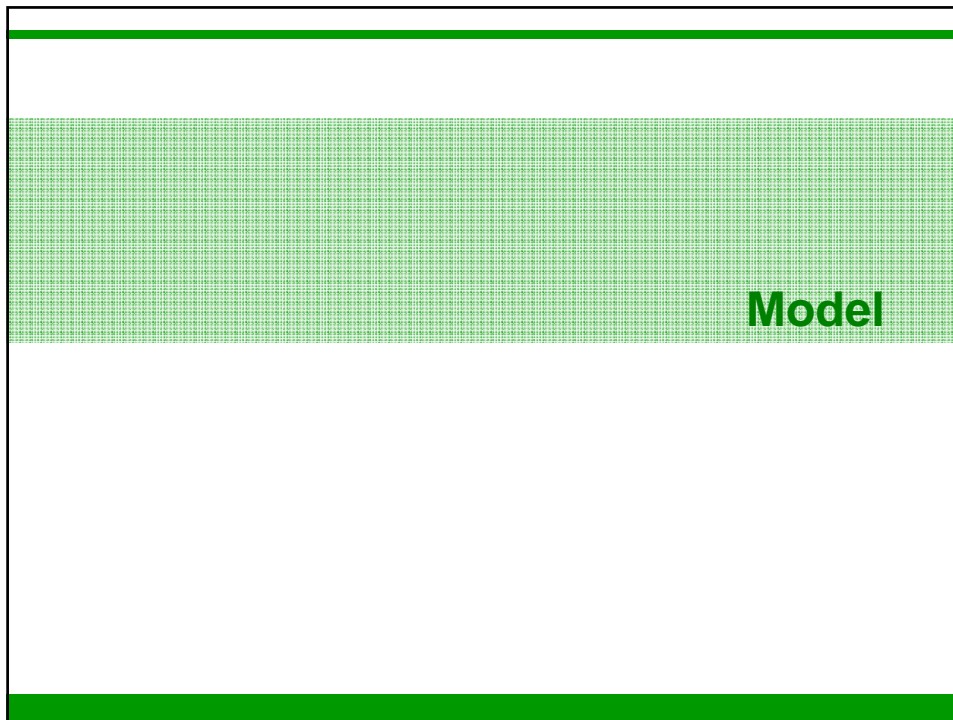
Wire						
Distance	Definition	Main Utilization	Fiber		Copper	
			Single Mode	Multi Mode	ISDN	DSL
Long	Backbone Network	Backhaul	Speed: G, Tbps Loss: Low Coverage: Long Cost: High Capacity: High	NA	NA	NA
Middle	Interface between Backbone and Access line	From 20Km*	Cost: High	NA	NA	NA
	Interface between Backbone and Access line	Up to 20Km*	Cost: Very High	Cost: High	NA	NA
Short	Last One Mile	Access	Cost: Very High	Speed: High Interference: Low Cost: Mainly labor cost Capacity: Medium	Speed: 64Kbps x n No exchange network, Technology: declining, need to secure spectrum	Speed: several dozens of Mbps/ Max up to 10km Rural: bad quality only Several Mbps/ several km Max.

*20Km is defined here referring to current wireless LAN technology and field trials reports. NA=Non applicable

Classification of Radio telecommunication technologies

Radio							
Distance	Definition	Main Usage	Microwave		Cellular	Wireless LAN	
			Satellite	Terrestrial	Mobile phone	WIFI	WIMAX
Long	National Backbone Network	Backhaul	Cost: High Speed: Low Transmission delay: High Usability: LOS	Usage: Mainstream trunk line used by telecom companies, Cost: High	NA	NA	Possible
Middle	Interface between Backbone and Access line (Long distance)	From 20Km*	Cost: High Speed: Low Transmission delay: High Usability: LOS	Usage: Mainstream trunk line, Cost: High	NA	Interference: High Usability: LOS (Several km)	New technology : communication speed will automatically change depending on the environment Usability: NOLS Distance: Several dozen Km
	Interface between Backbone and Access line (Short distance)	Up to 20Km*	Cost: High Speed: Low Transmission delay: High Usability: LOS	Usage: Mainstream trunk line, Cost: High	Coverage: expandable with cells.	Interference: High Usability: LOS with external antenna	New technology : equipment device is expensive Usability: NLOS Reflected wave: utilizable
Short	Last One Mile	Access	Cost: High Speed: Low Transmission delay: High Usability: LOS	Equipment device: High cost License: required	Dissemination rate: Phone call and SMS are high Speed: Low	Cost: Very low Diffusion rate: High (Cheap:several meters)	New technology : equipment device : expensive and still unfamiliar, no terminal product available yet.

*20Km is defined here referring to current wireless LAN technology and field trials reports. NA=Non applicable



Type of Models

Model		Characteristics
Model 1	Simple	One transmission medium covers end to end
Model 2	Hybrid* A	Connecting Trunk line and Access line by using two different transmission medium
	Hybrid B	Rural areas where it is impossible to extend enough network, interface transmission placed between Backhaul and Access makes it more realistic.

*Hybrid is defined as more than one transmission medium.

Model 1: Simple
Example: Satellite Telephony

**One transmission medium covers:
From Trunk line to Access line**



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Model 2: Hybrid A
Example: (Optical fiber /Microwave PTP) + WiFi

One transmission medium



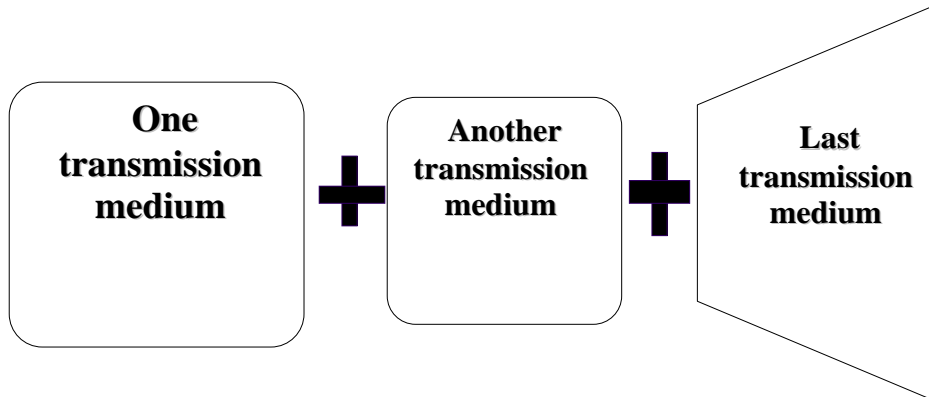
**Another
transmission
medium**



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Model 2: Hybrid B

Example: Satellite+ WiFi + optical fiber



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**Broadband Connectivity
and Power Supply**

Broadband Connectivity (ITU-D SG2 Q10-2/2)

- E-discussion group of ITU-D SG2 Q10-2/2 “Telecommunication for rural and remote areas” recommend to use 256Kbps* as broadband connectivity for rural and remote areas.
- This will not only allow access to internet, web-browsing, e-services for individual but also social or public usages such as medical consultation services, e-education services etc.

* Source: ITU-D SG2 Q10-2/2 e-discussion web log at : <http://www.itu.int/ituweblogs/ITU-D-SG2-Q10/>

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Power supply

- Power supply is the most crucial yet severe issue when dealing with telecommunication technologies for rural and remote areas.

Rural areas where commercial power are not reached, power systems based on renewable energy resources such as wind power facilities, mini-hydroelectric power facilities, batteries and/or solar panel should be arranged.

- ICT facilities consistent with the capacity of power must be chosen.

- For more information see:

Output document of ITU-D SG2 Rapporteur's Group: “Analysis of case studies on successful practices in telecommunications for rural and remote areas.” Available free of charge at: <http://www.itu.int/pub/D-STG-SG02.10.1-2006/en>

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Designing Framework

Factors to consider

Socio-geographical

- Country size
- Topographic features
- Population density



Infrastructure

- Policy framework
- Existence of power supply
- Existing network
- Existence of electric wire

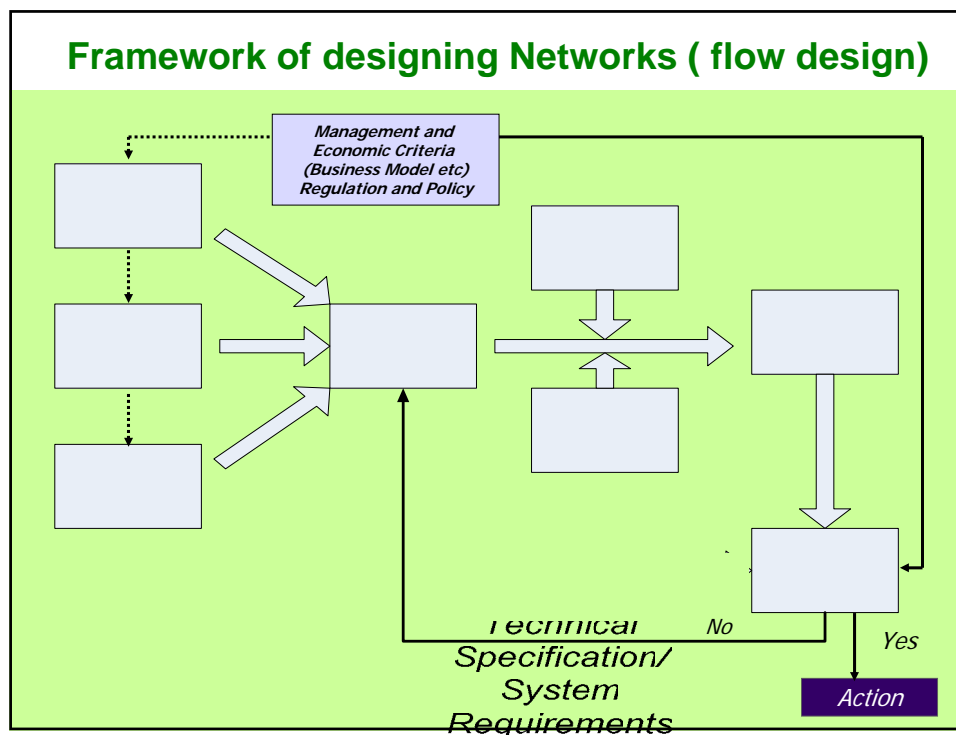
Technical

- Delay (in case of digital transmission) and loss/error rate
- Resistible to disasters
- Role out time
- Maintainability
- Compact size and low price will be better
- Availability of spectrum

Service

- Telephony
- Internet
- SMS
- e-health, e-education
- video





*User behaviour
Characterisation*

*Outline design
(Coverage,
Capacity,
Quality)*

Conclusion

- Drafting the said guideline is useful for the decision makers and practitioners of the rural communications development in AMC.
- The ITU-D SG 2 on telecommunications for rural and remote areas has been working for years to develop a guideline for communications development in rural and remote areas.
- They are conducting global survey and analysis of the collected data on the subject.
- Maitland Report, also known as the Missing link, Maitland +20, Global Survey, WSIS Outcomes, Golden Book, these all constitutes the basics toward building this comprehensive guidelines.

Conclusion (cont.)

- The guideline should be based on the real data on the environment of AMC so joint survey of their communications environment in rural and remote areas of AMC is recommended.
- Thus, in order to build guideline for ICT services for rural and remote areas, ASEAN member countries are recommended to join the activities of this task group and share their experience to develop suitable policies, rules & regulation, financing methodology and criteria for choosing technologies for rural and remote areas.

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