Rural Telecommunication Development in Indonesia

case study :

(Progress of Satellite Implementation and "Future Works")

Presented by

Risvan Dirza (09R12111)

E-mail : ris_frans87@yahoo.com

YSEP-Research Student

Fujita Laboratory

Department of Mechanical and Control Engineering.

Tokyo Institute of Technology

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Outline

- **BACKGROUND**
- **OBJECTIVE**
- **CURRENT CONDITION**

  Telecommunication & Telecommunication Services in Indonesia

  (Satellite, Infrastructure, VSAT, E-Health, E-Learning etc)
- **EVALUATION**

  (Data Progress & Problems to Tackle)
- **PROPOSED SOLUTION (HAPS)**

  (Why HAPS?, Illustration & Challenges)
- **CLOSING**

Background (1)

Geography :

1. Over 17,000 islands, 6,000 inhabited
2. Comparing on a mp of the US, Indonesia would stretch from New York to San Francisco.
3. Located on the circumference of the Pacific Volcano.
4. Bordered by the ocean and continental plates.

Climate :

1. Tropical, considerable areas of rain forest.
2. Monsoon rains and broadleaf trees make satellite and cellular communication difficult.

EASY TO SEE :

- **TERRESTRIAL INFRASTRUCTURE SHOULD BE APPROPRIATE WITH THOSE CONDITION.**

*[1]-[2]

Background (2)

General Map

Climate Map

*[1]-[2]

Background (3)

Population, Ethnicity and Language:

1. Around 240 million people (4th)
2. More than 65% live in Sumatera & Java
3. Rural Areas : < 13 people/km^2!!
4. Over 250 distinct ethnic populations, most with their own language or dialect. “Bahasa Indonesia” is the official language for government and commerce
5. 70% Rural population

EASY TO SEE :

COMMUNICATION IS IMPORTANT!!

*[1]-[2]

Background (4)

Population Density (Map)

Ethnicity (Map)

*[1]-[2]

Objective

- To provide the basic telecommunication infrastructure associated basic telecommunication services within none severed areas (majority rural areas)
- To provide new telecommunication service such as e-education, e-health, e-administration and e-business in the rural areas as well.

Telecommunication in Indonesia(1)

Satellite

- Satellites are essential for these wide coverage area.
- Indonesia has launched serial satellite

  (named PALAPA-A, PALAPA-B, PALAPA-C, and PALAPA-D)

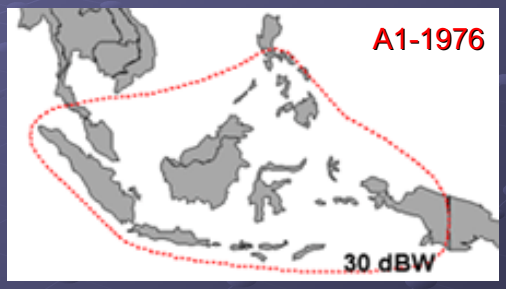
  and developed many ground infrastructure.

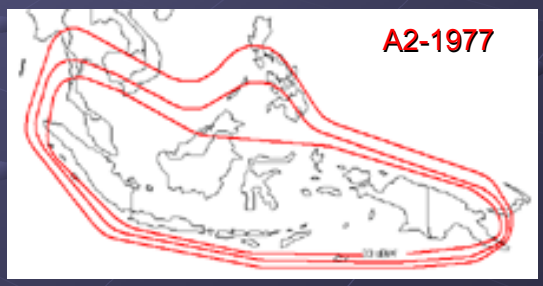
Telecommunication in Indonesia(2) Satellite-PALAPA-A

PALAPA-A's Spec :

- Identical to early WESTAR satellites from Hughes built for Canada and USA
- 12 Transponders
- Could carry 6000 voice channels or 12 TV stations
- Located at 77° E longitude
- Design lifetime of 7 years

Coverage Area





*[3]&[4]

Telecommunication in Indonesia(3) Satellite-PALAPA-B

PALAPA-B's Spec :

- 24 Transponders, each can carry 1000 voice channels or 1 TV station
- Operates in the C-band 3.7 – 6.4 GHz, EIRP 34 dBW

Serial Launching :

B1 Launched in June 1983

B2 Launched February 1984 – Faulty perigee kick motor, $75 million insurance claim

B2P Launched March 1987

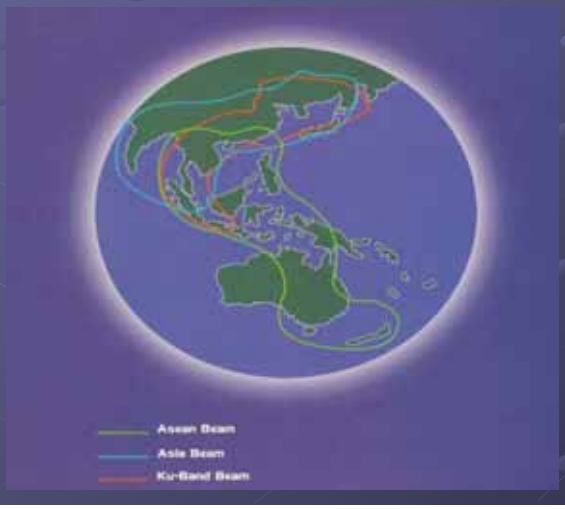
B2 Recovered by a US space shuttle crew and resold to Indonesia. Relaunched as B2R in April 1990

B4 Launched May 1992

*[3]&[5]

Telecommunication in Indonesia(4) Satellite-PALAPA-C

- C1 Launched Jan 1996, C2 Launched May 1996
- 30 C-Band (24 active, 6 spare) transponders, 37 dBW EIRP
- 4 Ku-Band transponders, 50dBW EIRP
- Unfolds to 21m in length, Solar panels provide 3700 W of power



PALAPA-C's Coverage Area
Consist of
1. Asean Beam
2. Asia Beam
3. Ku-Band Beam

*[3]&[6]

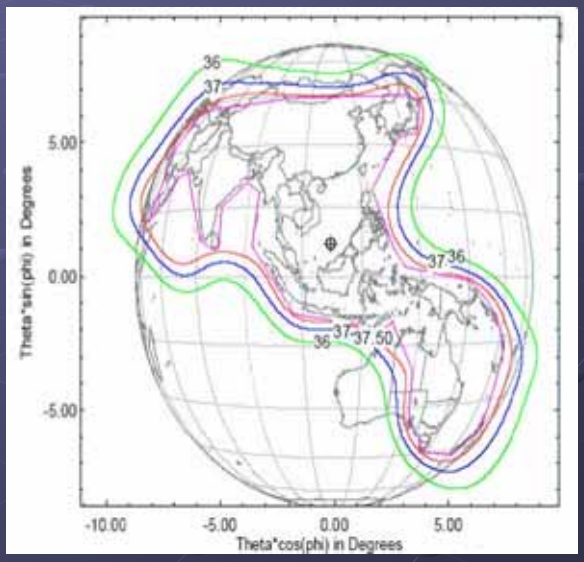
Telecommunication in Indonesia(5) Satellite-PALAPA-D

- Launched 31 August 2009.

Spec :
- 35 C-Band (24 standart, 11 extended) transponders.
- 5 Ku-band transponders
- Payload power = 6000 W.
- Lifetime 15 years (guaranteed)

Coverage Area :

Indonesia, ASEAN, Asia Pacific, Middle East and Australia.



*[3]&[7]

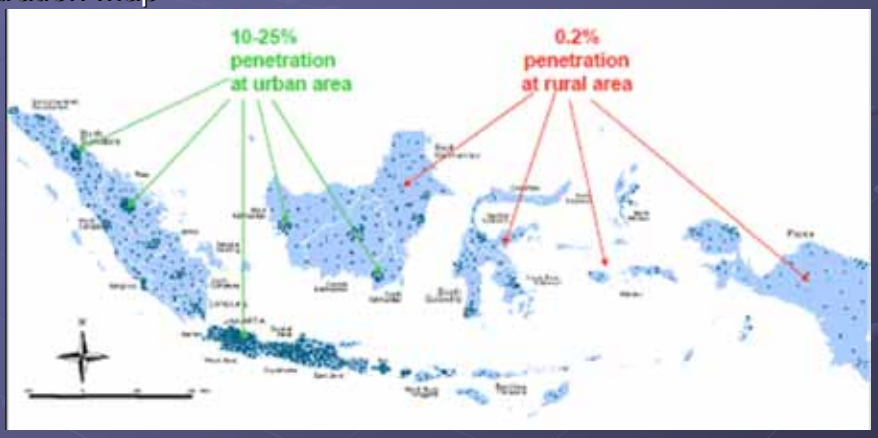
Telecommunication in Indonesia(6)

- The Recent Telecommunications Access Infrastructure (As of 31th Dec 2006):
  - 14.6 Millions consist of :
    1. 8.7 Millions Fixed Line
    2. 5.9 Millions Fixed Wireless Access
  - 63 Millions Cellular
- Tele-density :
  Major cities 10 – 40 %,
  Rural : Less than 0.2 % (38,471 Villages without Telephone Access)
- The Investment in Rural Areas, Isolated Areas, And Border Areas is NOT Commercially Viable.

*[8]

Telecommunication in Indonesia(7)

Penetration Map

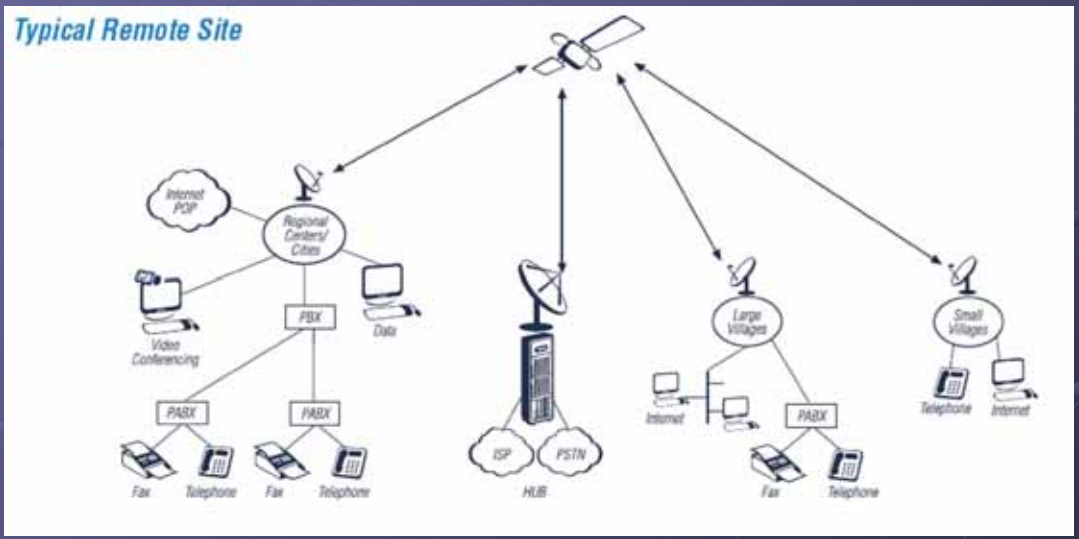


EASY TO SEE : Rural Areas are located separately and far away each other.

Terrestrial Infrastructure should has wide sensing area or should be in tremendous number AND Commercially Viable

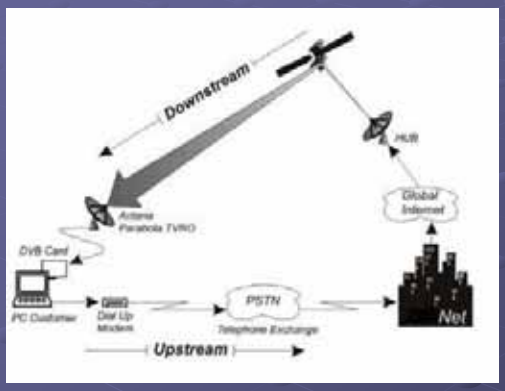
*[8]

Telecommunication in Indonesia(8)



*[8]&[11]

Telecommunication in Indonesia(10) (One Way VSAT)



- One-way VSAT service costs $33 - $270 per month including equipment rental
- Still requires a modem and phone line for upstream
- Not feasible for many rural areas

*[9]&[10]

Telecommunication in Indonesia(11) (Two Way VSAT)

- Service costs $700 - $800 per month (satellite up and down link)
- Useful for education in areas without phone lines

*[9]&[10]

Telecommunication Services

- e-learning and e-education

  such as spreading information through internet and mobile phone.
- e-health

  such as SMS health consultation (in developing progress)
- e-administration and e-business

  such as a transaction through the internet

  (All of those services hopely, be implemented in rural areas)

*[11]-[14]

Progress

- **Improving but Slowly !!**

	Phones /100	Cell Phones /100	Internet Hosts /10000	PCs /100	Internet Users /10000
Indonesia	3.6	5.5	2.2	1.1	191
China	16.7	16.1	0.68	1.9	460
Malaysia	19.8	34.9	21.1	12.6	2731
Philippines	4.2	17.8	3.9	2.2	255
Singapore	46.4	79.2	479	50.8	5396

*[11]-[15]

Problems to Tackle

- Satellites are expensive in this case
- Terrestrial or Ground Infrastructure are always in danger of earthquake or another disaster.
- Indonesia's Island are located separately (by the wide ocean) and Rural area are also formed separately.
- The growth rate are slower than the other country (in fact)
- Rural Areas are not commercially viable.

Proposed Solutions
(Future Technology)

HAPS (High Altitude Platform Station)

Why HAPS

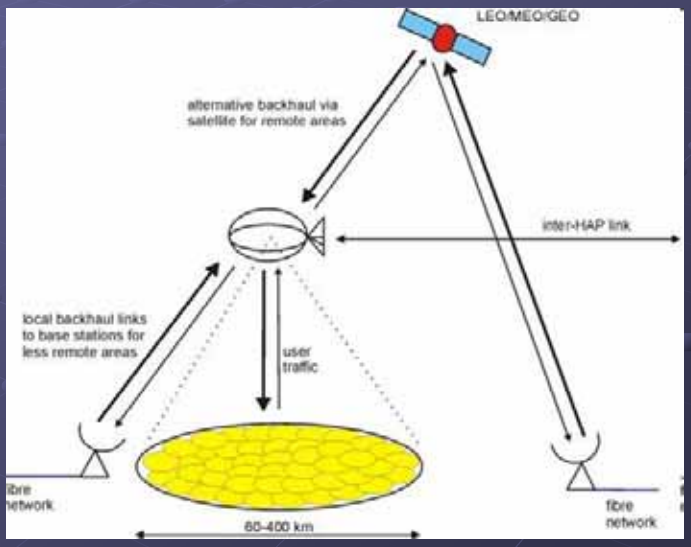
- Safe from earthquake or another terrestrial disaster.
- Coverage more area than another terrestrial station/infrastructure for each unit (780.000 km^2)(Radius 500 km).
  - Smaller than Satellite but Effective.
- Related to the above statement, HAPS will be cheaper than satellite.
- Suitable for broadband technology
- High Mobility (has a motor inside to move to the other area)
  1. Helpful whether there is a disaster which destroy another terrestrial infrastructure or
  2. Overcoming the geographically problem, such as mountainous, ocean etc.
  3. Could be profitable for business point of view.
- In transition era, HAPS can be used as a moveable station
- In targeted era, HAPS will replace satellite role.

*[16]&[20]

Illustration(1)

Transition Era

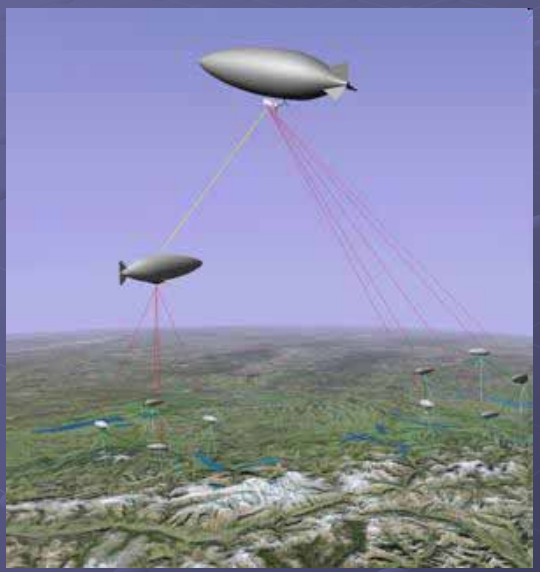
- Signal from the other source, will be transmitted through satellite to HAPS
- Terrestrial Station could send signal directly to HAPS without using the satellite



*[16]&[20]

Illustration(2)

Targeted Era



Number of HAPSs will work together and share information each other

This strategy, expectedly, is able to increase the number of The Growth Rate of Rural Telecommunication in Indonesia

*[16]&[20]

Challenges

- The motor inside HAPS should be powerful enough to control any air disturbances.
- The deployment should start from a rural area which is located around 1000 km from urban area in order to satisfy the business point of view.

*[16]&[20]

Any Questions??

Closing

Thank You

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