Rural Telecommunication Development in Indonesia

case study :
(Progress of Satellite Implementation and “Future Works”)

Presented by

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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 map 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]
Population, Ethnicity and Language:

1. Around 240 million people (4th)
2. More than 65% live in Sumatera & Java
3. Rural Areas : < 13 people/km²!!
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!!
Background (4)

Population Density (Map)

Ethnicity (Map)
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.
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

* [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
- B4 Launched May 1992

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 standard, 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]
The Recent Telecommunications Access Infrastructure (As of 31st 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.
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)
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
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 !!**

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<th>Country</th>
<th>Phones /100</th>
<th>Cell Phones /100</th>
<th>Internet Hosts /10000</th>
<th>PCs /100</th>
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*\[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 km²) (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]*
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.
Any Questions??
Closing

Thank You
References(1)

References (2)


