PT Excelcomindo Pratama Tbk.

Telecommunication Industry

December 2007

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- Access Network: 2G and 3G
- Core Network: Mobile Soft-Switch
- Transmission:
  - TDM (PDH – for Transmission Access)
  - (SDH, DWDM – for Backbone)
  - (VSAT – for access in isolated area, or backup)
  - IP (MPLS – for IP Backbone)
Outline

Agenda

1. Telecommunication Industry Overview
   - Telecommunication network; Mobile or Fixed?
   - The Mobile Source Growth; Voice or Data?
   - Asia Pacific Mobile Telecoms Market
   - Indonesian Market

2. Industry Trend and Technology Evolution

3. Summary and Feedback
Mobile of Fixed?
More mobile consumers than fixed network subscribers

**Worldwide**
- Mobile subs growth surpassed fixed subs growth.
- Mobile traffic is increasing while fixed traffic is decreasing in all major markets.

**Indonesia**
- Mobile subs surpassed fixed line in 2002 and continuously growing.
- Growth of fixed line coming from CDMA-based fixed wireless technologies.
- Wireless will be preferred media of communications.
Voice or Data?  
Mobile Voice and Data ARPU trend

Sample Case in US

- Mobile Voice ARPU slowly declined
- In opposite, Mobile Data ARPU gradually increased
- Indonesia will follow in the next few years

Source: Chetan Sharma Consulting, Aug 2007
APAC growth driven by India and Indonesia
Asia Pacific Telecoms - Penetration

Source: Frost & Sullivan, 2007
APAC subscriber growth in 2007 still driven by 2G/2.5G
Asia Pacific Telecoms – Mobile Subscribers

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007 (e)</th>
<th>YOY (e)</th>
<th>2005</th>
<th>YOY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscriber base</td>
<td>959.1</td>
<td>1,129.9</td>
<td>17.8%</td>
<td>772.6</td>
<td>24.1%</td>
</tr>
<tr>
<td>3G Subscribers</td>
<td>93.3</td>
<td>118.8</td>
<td>27.4%</td>
<td>58.6</td>
<td>58.8%</td>
</tr>
<tr>
<td>2G/2.5G Subscribers</td>
<td>865.8</td>
<td>1,011.1</td>
<td>16.8%</td>
<td>713.9</td>
<td>21.3%</td>
</tr>
<tr>
<td>3G ratio</td>
<td>9.7%</td>
<td>10.5%</td>
<td></td>
<td>7.6%</td>
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</tr>
</tbody>
</table>

Source: Frost & Sullivan, 2007
Indonesia Telecommunication Industry Trends

Mobile and Internet Industry are main drivers of Indonesia telecommunication industry

Source: BMI, 2007
Wireless Voice and SMS remain the biggest contribution

Voice and SMS: 71% of total telecom revenue (87% excl PSTN) in 2010

1. Including FWA
Source: IDC; Analyst reports; Team analysis
Indonesia Telecommunication Industry Trends - Wireless

Wireless revenue will have slower growth, but the intense of competition will higher

- Actual and forecasted wireless revenue growth
  - CAGR: 34%
  - CAGR: 16%

- SIM’s penetration
  - Actual: 9%, 14%, 22%, 27%, 38%, 46%, 52%, 58%
  - Forecast: 58%

- No. of Players
  - 3-5 Players
  - >11 Players

Source: Analyst report; Team analysis
Outline

Agenda

1. Telecommunication Industry Landscape

2. Industry Trend and Technology Evolution
   - Industry Trend
   - Telecommunication Vision
   - Technology Roadmap

3. Summary and Feedback
Future Trend: Driven by Market’s Needs of Communication & Information

Convergence is a trend of telecommunication!!

Customer’s needs:
- Multi services: Voice, Text, Image, Video
- “Seamless experience” in technology crossover
- One number (profile) for multi access service
- Broadband internet/data
- Less Price
- Mobility
Future Trend
Growth of Fixed Mobile Convergence

- Development of Fixed Mobile Substitution
  - Fixed network already been crowded by mobile network
  - Driven by mobile handset functionality
- Mobile vs. Fixed
  - Fixed operators enter broadband outdoor with BWA technology.
  - Mobile operator enter wireless indoor with BWA technology.

- The trend will continue given the focus on Fixed Mobile Convergence (FMC)
  - Offering mobility, flexibility, and all in one product
Network will be all-IP based and converged in the future

- **Fixed Network**
  - Copper (TDM) to xDSL

- **Mobile Network**
  - 3G and HSPA

- **Cable Network**
  - Internet access in setup box.

**Converged NGN** will be the future network.

Source: FOKUS - Berlin, 2006
Potential Impact of global trend to Indonesia in the future

**3G Arena:**
- Incumbent
- New entrant
- cdma2000

**VoIP Operators:**
- Gaharu Etc.

**Broadcast Operators:**
- astro
- m2v

**Digital TV**

**BWA Arena**
(fixed/low mobility):

**IP-based services**
- Presence
- Mobile TV
- High speed Data
- High Speed Data
- Video on Demand
- VoIP Service
- Internet
- Video Call
- FMC
- Internet
- Video Call
- FMC

**Voice over IP**

**Fixed Line Operators:**
- PSTN

**Media Arena**
- Yahoo!
- talk

**Media over Internet**

**Source:** Internal Analysis
THE VISION

Network Convergence
• Take advantage of IP technology to deliver capital and operational efficiency for mobile operators by providing consolidated and optimized multiservice transport for TDM, ATM, SS7, and enable IP services in the RAN and core.

Service Convergence
• Offer converged per-subscriber service enablement including control, security, charging, and mobility over heterogeneous cellular, WiFi, and WiMAX networks.

Application Convergence
• Allow operators to deliver revenue growth by quickly and efficiently delivering new SIP-based and IP-based services to retail and enterprise customers.
Wireless Technology Roadmap

Evolution of wireless access technologies

<table>
<thead>
<tr>
<th>Year</th>
<th>Technology</th>
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<tbody>
<tr>
<td>1983</td>
<td>AMPS</td>
</tr>
<tr>
<td>1993</td>
<td>GSM</td>
</tr>
<tr>
<td>1995</td>
<td>CDMA (IS-95)</td>
</tr>
<tr>
<td>2000</td>
<td>1xRTT</td>
</tr>
<tr>
<td>2005</td>
<td>1xEV-DO Rev. A</td>
</tr>
<tr>
<td>2010</td>
<td>OFDM-MIMO (3GPP2 Evolution)</td>
</tr>
</tbody>
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Source: Siemens, Jan 2007
The migration to NGN with IMS will enable integration (convergence) of broadband, video, wireless and wireline services.

*) Year is the projection launch time, and subject to awarded license. Technology is on mature stage or has been deployed on other countries.
From TDM to ATM to ‘All IP’…
Effort Required

High effort at the beginning and then ...
Example of Product & Services roadmap

PAST 2007 2008 2009 2010 FUTURE

Circuit Based Services
- TDM Voice
- SMS
- Voice Mail
- Voice SMS
- CLIR, Call Forwarding
- Conferencing
- Call Waiting
- VoIP
- GPRS
- Internet Access
- Data Access
- Internet Access

Packet Based Services
- Video Call
- Video Conference
- Video Sharing
- Mobile TV
- m-commerce
- Information Services
- Location Based Services
- m-advertising
- VoIP (PC)
- Large File Transfer
- Video on Demand
- High Volume Internet
- Multimedia Messaging
- Interactive Games
- Voice Call Continuity (VCC)
- Unified Messaging
- Directory
- Presence
- Real-time Chat
- Push to talk
- VoIP (Handset)
- Multimedia conferencing
- Video mailbox

Full Mobility
- GSM+GPRS
- 3G+HSPA
- IMS

Low Mobility
- Fixed BWA
- Low Mobility BWA

*) Depending on the business feasibility

Full IMS Services (NGN)
All IP Network (fully convergence)
Common Platform
Common Devices

Convergence
# Agenda

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<td>Summary and Feedback</td>
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**Outline**

- Summary
- Feedback
SUMMARY

Despite of significant Data traffic growth, Voice and SMS will still be the major contributors to the Telecommunication Industry Growth at least for the next 5 years

Wireless market in Indonesia has become a very competitive market with many players involvement. This trend will force player to endorse low pricing strategy

The technology development is still driven by equipment manufacturer/vendor

The industry trend is going towards fix and mobile convergence to offer more mobility, higher flexibility and all in one product concept

Converging multiple disparate networks into an IP platform makes good business sense for mobile operators. It results in lower operational costs and heightened efficiencies
Feedback

- Industri Telekomunikasi berkembang sangat pesat, teknologinya berrevolusi sangat cepat, memerlukan banyak sumber daya yang siap pakai. Diharapkan lebih banyak lagi pengkayaan dalam kurikulum di universitas yang membahas teknologi yang dipakai di industri, sebagai tambahan dari ilmu dasarnya.

- Menyiapkan sumber daya atau lulusan yang mampu melihat dari berbagai sisi, selain dari sisi teknikal atau teknologi tapi juga aspek regulasi/undang-undang, industri and bisnisnya.

- Universitas mendekati Industri dan sebaliknya untuk mengurangi kondisi sebagai net buyer, melakukan riset untuk area khusus (selected development), misalnya untuk OEM (Other Equipment Manufacturer), tidak perlu untuk main equipment. Juga untuk merangsang pengembangan content atau aplikasi yang akan men-drive perkembangan technology oleh vendor, bukan hanya arah sebaliknya.
TERIMA KASIH