UQ WiMAX Gaining the Wireless Broadband Market

March 12, 2013

UQ Communications Inc., Corporate Officer, CTO

Dr. Fumio Watanabe
1. Successful business model
   - *Open retail devices & Open Network* -

2. Expansion of WiMAX market
   ✓ WiMAX as Wi-Fi Backhaul
   ✓ Transportation Systems
   ✓ Digital Signage
   ✓ Remote Camera Monitoring
   ✓ Smart meter network
   ✓ WiMAX Campus Network
Successful business
– Open retail devices & Open Network –
Rapid Growth (Number of Subscriber)

- 1M (June 15, 2011)
- 2M (Feb 26, 2012)
- 3M (July 14, 2012)
- 4M (Feb, 2013)

Flat Rate at JPY4,480
Flat Rate at JPY3,880
UQ Flat
UQ Step
WiMAX embedded PC
Mobile Wi-Fi Router
Data Cards
Mobile Wi-Fi Router
Mobile Wi-Fi Router

70% pops covered
80% pops covered
94% pops covered
Getting the Best Service Awards

The best Customer Satisfaction in mobile data services

Mobile Award 2012 by “RBB TODAY”

Mobile Communication Service

Mobile Router

Public Wi-Fi Service
Rapid Growth (Number of Base Station)

- Nationwide Population coverage: 94%
- Covering 1,186 cities in the nation
- Population covered in major cities: 99%

Graph showing the rapid growth in the number of base stations from June 2009 to June 2013, with milestones such as August 2010 (over 10,000 BS), April 2012 (20,000 BS), and June 2013 (21,458 BS).
Various WiMAX devices for variety of needs
WiMAX/3G Dual-Mode Devices (by KDDI)

Smart Phone
- HTC J
- AQUOS PHONE Série Arrows Z
- URBANO PROGRESSO
- GALAXY S II
  - ISW13HT
  - ISW16SH by SHARP
  - ISW13F by FUJITSU
  - by KYOCERA
  - ISW11SC by SAMSUNG

DIGNO
- ISW11F by FUJITSU
- ISW11K by KYOCERA
- ISW12HT
- ISW11M

Provide Wi-Fi Tethering

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Retailers (Mobile Virtual NW Operators)

60 MVNOs provide with various business models

National Retailer
- Yamada Air Mobile WiMAX
- edion Kuel net
- Tojima WiMAX
- K'sケーズデンキ
- ベスト電器

ISP
- @nifty
- Biglobe
- So-net
- @TCOM
- Toppa! WiMAX

Telecom, CATV
- KDDI
- J:COM WiMAX
- STNet
- エネルギア・コミュニケーションズ

Others
- JR
- pilina (KCCS)
Expansion of WiMAX market
To offload 3G phone data traffic, UQ provides WiMAX backhaul for KDDI Wi-Fi APs.
**VIS (Visual Information System)**

- VIS provides with information such as flight information, news, weather report, advertisement and etc..
- WiMAX is best backhaul circuit between data center and train.
- WiMAX has made it possible for passenger to get valuable real time info even in the train.
Metropolitan Transportation Systems

Strategic alliance to provide WiMAX in major cities

Fukuoka
Osaka
Kyoto
Nagoya
Yokohama
Sapporo
Sendai
Tokyo

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Strategic alliance with subway, bus to provide WiMAX in stations, subway, bus.

SUBWAY

BUS
Tokyo Metropolitan Subway

Bipolar antenna

Omni-directional antenna

Pico BS

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>RF</td>
<td>10MHz×1RF</td>
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<tr>
<td>TX power</td>
<td>1W/Unit</td>
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<tr>
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<tr>
<td>weight</td>
<td>≒ 6kg</td>
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<tr>
<td>Input power</td>
<td>AC100V</td>
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Accelerate WiMAX adoption to various machines

Machine to Machine adoption

- Digital Camera
- Photo Frame
- Surveillance Camera
- Karaoke
- Live Broadcast
- Digital Signage
- Vending Machine
- POS
- Sticker Printing
Digital Signage

Contents distribution through WiMAX

Shinagawa Station (Biggest Signage with 44 displays)

Tokyo station

Sugamo station
Remote Camera Monitoring (Railroad Crossing)

- Transmits motion pictures at railroad crossing via WiMAX network.
- Real time monitoring of malfunction, physical accident and other troubles.
- WiMAX is easy to install and deploy such system in a short time.

Remote Camera Monitoring

- WiMAX Embedded module
- Camera
- Video recorder
- WiMAX BS
- Network
- Railway company, etc.

Interwork with Emergency system
- Announced that WiMAX will be used if field test is successful
- About 7 Million meters for 10 years deployment
- 2013～2015: about 0.3M meters/year
- 2016～: about 0.8M meters/year

<table>
<thead>
<tr>
<th>FY April–March</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<tr>
<td><strong>WiMAX Field Trial</strong></td>
<td>Design &amp; development</td>
<td>Test</td>
<td>Test</td>
<td>Field Test by module</td>
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<tr>
<td><strong>Commercial Deployment</strong></td>
<td>Study</td>
<td>★S—in</td>
<td>Initial NW deployment</td>
<td>Commercial Service</td>
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</table>
WiMAX Smart Meter field trial
- UQ WiMAX NW and certified modules
- Residential area test
- Urban apartment test
- Indoor testing

WiMAX testing in an actual meter box
TEPCO Smart Meter System

A) Multi-hop Radio (920MHz low-power dedicated radio) with concentrator
B) PLC with concentrator
C) 1:N Communication (Public data network, e.g. WiMAX/LTE/3G)

## TEPCO Smart Meter System

- **27 Million Meters for 10 years deployment**
- **About 3 Million Meters per year from FY2015**

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### Selection
- ▲RFP
- ▲Proposal
- ▲Evaluation & POC
- ▲Contract
- ▲Meter bid (1)
- ▲Meter bid (2)
- ▲Meter bid (3)

### Deploy
- ▲SM shipment
- ▲Field Trial
- ▲MDMS Operation start

### Volume
- 1.90 Million
- 3 Million

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*TEPCO Smart Meter System*

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WiMAX Solution in Education

示范它在和小学在和

1500套WiMAX嵌入式笔记本在三年内被引入。

Wakayama

即时互联网访问

Wakayama
WiMAX Campus Network Anywhere

Direct access to University campus network from anywhere without VPN.
Thank you for your kind attention.

Wireless Broadband Internet Mainstream