Opening the Door to an Information Society*
*"Foris“ (Latin): door, opening

Broadband Wireless Solutions for Digital Inclusion: The case of Mobile WiMAX

Dr. Yonathan Mizrachi, Digital Inclusion and E-Government officer

E-GOVERNMENT and PUBLIC PRIVATE PARTNERSHIPS for Better Public Service Delivery and MDGs implementation
WSIS Forum, Geneva, Switzerland, 21-22 May 2009
Who is Foris Telecom?

- A wireless broadband mobile WiMAX carrier and ISP provider that deploys and operates scalable, low cost, wireless data networks in emerging markets.

- Own Triple play licenses in 15 countries in Africa, Asia and the Caribbean (covering some 300 million people),

- Foris Telecom launched its wireless communication services in April 2009 in Mozambique, to be followed by Uganda and Haiti in August 2009. 5 more in 2010.

- Digital Inclusion as Core Sustainable Business Strategy (not corporate responsibility…..)
Mission

Foris Telecom aims to become a global leader in providing wireless mobile broadband services in emerging markets by being the first-to-market in offering affordable* and accessible** connectivity to millions of underserved people.

* Committed to OECD price levels in Sub-Saharan Africa and Least Developed Countries (LDC).
** Committed to finding ways to bundle connectivity with affordable access devices for around $30 per month.

What is the Key to realize this mission?
The First and the Second “Digital Inclusion Revolutions”

Note: * Estimates.
Source: ITU World Telecommunication/ICT Indicators database.
Mobile Telephony (voice)
The First “Digital Inclusion Revolution”

Note: * Estimates.
Source: ITU World Telecommunication/ICT Indicators database.
First “Digital Inclusion Revolution” Success Factors

- Lack of Fixed Infrastructure
- Urban First – Rural Later
- Bundling Access with Connectivity
- Affordability – Low CAPEX / OPEX
- Sustainable even with Low ARPU
The Urgent Need for a Second “Digital Inclusion Revolution”

- The First Digital Inclusion Revolution Succeeded in Voice Connectivity
- It has FAILED in providing Internet Connectivity in Developing Nations!
- Internet Connectivity Demands a Second Digital Inclusion Revolution!

Source: ITU World Telecommunication/ICT Indicators database.
# Broadband Wireless Mobile WiMAX: The Second Digital Inclusion Revolution

<table>
<thead>
<tr>
<th>Media</th>
<th>Internet</th>
<th>Voice</th>
<th>Television</th>
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<tr>
<td>Current Infrastructure</td>
<td>Copper</td>
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<td>Cellular</td>
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<tr>
<td>Current CPE *</td>
<td>Modem</td>
<td>Telephone</td>
<td>Decoder</td>
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</table>

*CPE – Customer Premise Equipment

**Mobile WiMax = Triple-Play Convergence**
Broadband (Convergence)
The Second “Digital Inclusion Revolution”

Fixed broadband subscribers by geographic region and by level of development

Source: ITU World Telecommunication/ICT Indicators database.
Broadband (Convergence)
The Second “Digital Inclusion Revolution”

Mobile broadband subscriptions

Source: ITU World Telecommunication/ICT Indicators database.
The Second Digital Inclusion Revolution
Anticipated Success Factors

- Lack of Fixed Infrastructure
- Urban First – Rural later
- Bundling Access with Connectivity
- Affordability – Low CAPEX / OPEX
- Sustainable even with Low ARPU
Low CapEx = The Key to Mass Penetration

Reduced CapEx* = Reduced ARPU** = Increased Penetration = Mass Participation

*CapEx = Capital Expenditure per User
**ARPU = Average Revenue per User
Internet Penetration as fraction of GNI*

* Gross National Income (GNI) comprises the total value of goods and services produced within a country (i.e., its Gross Domestic Product), together with its income received from other countries.
End to End connectivity (Vertical Integration): as the key to low CAPEX

Offering all of the system components for < $150* per subscriber
Operational & Technological Leverage

- Specific operational experience and relationship in developing countries
- Towers acquisition and management
- Operations and maintenance in developing countries
- 45 worldwide offices
- A leading telecom integrator
- Immense network build-up experience
- Mobile WiMax base stations and CPEs
- WiMax Chipset design
- Spectrum flexibility
- Access controller
- NOC design
- Subscriber control
- IP network management
- Advanced billing solutions
- Unique SoHo solutions
- Towers acquisition and management
- Operations and maintenance in developing countries
- Immense network build-up experience
- Mobile WiMax base stations and CPEs
- WiMax Chipset design
- Spectrum flexibility
How Low CapEx and Penetration is Achieved?
Competitive Advantage through Innovative Approach

- **Product Innovation**
  - One of the first eight Mobile WiMAX products to receive the WiMAX Forum Certified Seal of Approval. Chipsets, Base Stations (Antennas), and Modems by Runcom, Ymax, ITS
  - Hosted NOC Solution

- **Service and Offerings Innovation**
  - OECD prices in Sub-Saharan Africa (lower ARPU values = higher penetration)
  - Pre-paid models and Innovative PC/modem bundling programs in Mozambique
  - Innovative marketing strategies and branding
  - Upcoming large array of Value-Added Services (e-Gov, e-Health, job and dating portals)

- **Process (operational) Innovation**
  - Tight Value Chain Integration = lowest WiMAX CAPEX in the world!
  - Negotiating power vis-a-vis suppliers (15 countries….)
  - Effective planning, integration and operation (Foresoft, Towervision, Leadcom, Bakcel)
  - FTS – innovative CRM and billing platform
  - PPP with governments and value chain complementary players
Prospective Markets ~ 800M POPs

South west Africa
- Congo (DRC): 102.9 m
- Congo (Rep.): 66 m
- Cameroon: 3.8 m
- Angola: 18 m
- Central Afr. Rep: 11.5 m

South & East Africa
- Mozambique: 61 m
- Zimbabwe: 21 m
- Zambia: 12 m
- Botswana: 2 m
- Malawi: 14 m

CIS
- Azerbaijan: 77 m
- Georgia: 8 m
- Ukraine: 5 m
- Kazakhstan: 47 m

South East Asia
- Vietnam: 156 m
- Cambodia: 85 m
- Laos: 15 m
- Sri Lanka: 6 m
- Nepal: 21 m

Americas
- Colombia: 100 m
- Dominican Rep.: 45 m
- Costa Rica: 9 m
- Guatemala: 4 m
- Peru: 13 m

West Africa
- Nigeria: 210 m
- Ghana: 135 m
- Senegal: 22 m
- Mali: 22 m
- Ivory Coast: 18 m

East Africa
- Tanzania: 70 m
- Uganda: 40 m

Geneva, May 2009
Licensing & Spectrum (addressable markets)

Current licenses
- Congo Brazzaville: 4MM
- Congo DRC: 66MM
- Uganda: 30MM
- Mozambique: 21MM
- Zambia: 12MM
- Kazakhstan: 16MM
- Azerbaijan: 8MM
- Nigeria: 60MM
- Haiti: 8MM
- Central Africa: 4MM
- Malawi: 14MM
- Cameroon: 18MM
- Total: 261 MM

Final stages
- Cambodia: 14MM
- Botswana: 2MM
- Cote d'Ivoire: 20MM
- Guinea: 10MM
- Nepal: 29MM
- Liberia: 4MM
- Senegal: 13MM
- Ghana: 23MM
- Rwanda: 10MM
- Total: 125 MM

Advanced stages
- Costa-Rica: 4MM
- Vietnam: 85MM
- Ukraine: 46MM
- Uzbekistan: 28MM
- Tanzania: 39MM
- S. Russia: 24MM
- Total: 226 MM

Total = 612 MM
Focus on the faster growing, underserved*, “Emerging and Developing Markets”
PPP and Digital Inclusion as Core Business Strategy

Unique Combination: Operational Know-how & Significant Technological Advantage

Tipping point
CapEx < $100 per user **

* Estimated at 10% - 15% of the global communications market by 2015
** Not including CPE. Compared with existing market CapEx of $800-1000
## Comparative Pricing

<table>
<thead>
<tr>
<th>Country</th>
<th>Netcom</th>
<th>Foris</th>
<th>Swift Networks*</th>
<th>Foris</th>
<th>Teledata Internet**</th>
<th>Foris</th>
<th>Teledata Internet**</th>
<th>Foris</th>
<th>Uganda Telecom</th>
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<td>$150 Modem fees + $10 (monthly)</td>
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* Plus some free calls to the US for the first 3 months

** Based on Fixed Wimax

- Foris Telecom offers a significantly broader and cost effective offering than the competition
Distinctive Foris Brand in Target Markets
Distinctive Foris Brand in Target Markets
Foris Telecom will reduce digital divides and promote digital inclusion by partnering with governments to foster a transition to an information society and knowledge economy in developing countries through the facilitation of public-private-people partnerships and business alliances designed to establish a one-stop shop solution for connectivity, access, ICT skills and content.

What is the Key to realize this vision?
Four Pillars of an Information Society

Partnerships

Accessibility
PC’s, PDA’s
Work with Partners to provide users with PC’s’ and PDA’s

Connectivity
Telco’s & Carriers
Affordable WiMAX Based Broadband

Education
21st Century Skills
Work with partners to enhance ICT Related Literacy Skills

Content
e-Services
Work with Partners to provide local and relevant Content

A One Stop Shop for Information Society via Public-Private-People Partnerships
Foris brings its access and funding partners to the table to discuss, together with governments, the bundling of Netbooks and Broadband Connection for public sector players:

- Working with the Eduardo Mondlane University (20,000 students) and the Pedagogical University (largest teacher training program in MZ (40,000 university Students) towards bundling of advanced Netbooks with Internet Connectivity and free unlimited VOIP calls within the student network for $30 per month! (netbooks in 24 installments)

- Looking with the Government at a Government Assisted PC Purchase plan for Government employees

- Looking with the Government at special pricing of advanced Netbooks and Smart Boards for school teachers
Skills and Capacity Building related PPP and Business alliances (Mozambique)

- SAP University Alliance Program in Eduardo Mondlane University (Business Administration and Economics departments)
- Foris Telecom provides connectivity to the program and hosting for the SAP applications
- SAP provides faculty training, software, curriculum development
- Graduates gain formal recognition, business skills and better employment opportunities
Content and Applications related PPP and Business alliances (Mozambique)

- Some 60% of Government IT budget spent on communications. Foris will provide connectivity services for government - lowering its costs by at least 20%.

- SAP – Foris Telecom cooperation to provide back office ERP systems for E-Government.


- Foris Telecom will help advance the SchoolNet Program in Maputo by connecting public schools (with laptops for teachers)

- General: Partnerships for local content: Job Seeking, e-Commerce and Video Dating
Next Step – Digital Inclusion

eGovernment

eHealth

eLearning Education

eAgriculture

Gaming Video Chats

| Geneva, May 2009 |
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Digital Inclusion Deployment Strategy (Mozambique)

- **Stage 1**: Deployment + 6 months *(Start Small…)*
  - Small-Quick Wins: 1-2 very simple high visibility Digital Inclusion efforts (for example, connectivity for 2-3 schools which are part of Mozambique’s SchoolNet program, SAP University Alliance Program).
  - In the meantime, work on advancing the more ambitious CAMi (Computers for All Mozambique Initiative). Making connections, getting to know the players, adjusting for the politics of the process, etc.

- **Stage 2**: Up to 6-8 months after initial deployment *(Grow up…)*
  - Finalize implementation plan and PPP agreements
  - Announce the Government Assisted PC Purchase program (GAPP)
  - Rollout of a pilot (Just before the December 2009 elections)

- **Stage 3**: One year after initial Deployment *(Get bigger…)*
  - Full fledged program rollout
  - Start individual programs for small businesses with NGO’s such as Kiva.org
Bridging the digital divide in Nigeria

The Computer for All Nigerians Initiative - CANi, is a Government Assisted PC Purchase programme (GAPP) designed to expand the usage of computers and information technology within the country. This initiative has been implemented in other countries of the world-UK, U.S A, Singapore, Japan, China and Egypt among others. "CANi is a public-private partnership programme between the Federal Government of Nigeria, represented by the Federal Ministry of Science and Technology through its agency, National Information Technology Development Agency (NITDA), and two giants of the Information Technology industry - Microsoft Corporation and Intel Corporation. Its aim is to drive PCs penetration into sections of the Nigerian community which are currently underserved. The CANi Programme Management Office (PMO) run by AMB Multiserve Ltd has been established to implement the programme and

How to Participate
Download Application forms
- Individual
- Corporate
- Corporate Applicant
- UBA FORM

Package Offer
Order Process
Payment Requirement
Delivery Verification

Select Computer Type
Click to view available computer configurations
- Desktop
- Laptop

Manufactures Warranty

Sponsors
Next Step – Digital Inclusion
1) Q: At what frequency do you have your spectrum? A: Most of our spectrum is in the 2.5 G region with some spectrum in the 3.5 G and 2.3 G - Our offering is on the Mobile WiMax protocol but the application is mostly a nomadic one at stage one of our deployments

2) Q: Is the spectrum technology neutral or is it specified to be TDD/FDD? A: Neutral

3) Q: Is the spectrum a national license or is it only for some states/provinces? If not national, please indicate what population coverage the license is applicable for. A: In most places it is National (Congo DRC, Congo Brazzavile, Azerbaijan, Mozambique and Malawi) but in Nigeria it covers the 3 most populated regions (Abuja and Lagos)

4) Q: What is your population coverage plans for year 1, 2, 3, 4 and 5? A: Our business plan covers all of these aspects and once you’ll approve you receive the NDA we will give you access to our data room and you can see all of that

5) Q: What number of Base stations do you plan to deploy in year 1, 2, 3, 4 and 5? A: Same as above - overall we are using Microcell topology to cover an area and not a huge BTS to only get range so the numbers are very high
6) Q: What is your target market for the WiMAX service (Corp/SME/HO/Consumer)? If a mix, what is the mix? A: We are aiming at the mass market - we define this as the top 3 percentile of the population, we calculate how much these percentiles can pay for communication and assume a % of that (we assume that cellular gets a big chunk as well). Naturally, we also aim at Corporate and SME's but the pricing, the applications and the topology of our networks first and foremost are aimed at the consumers who will pay OECD price levels in Sub-Saharan Africa.

7) Q: Is the plan to allow a fixed, nomadic or mobile service? If staged, what is the timeframe for nomadic and mobile services on the network? A: Our offering will be first a nomadic offering but the network will be a Mobile network. We assume that for the first 1.5-2 years there will be limited real demand and CPE's offering for Mobile WiMax in the markets that we operate in.

8) Q: How much spectrum do you have? A: In most of the countries that we have the spectrum we have ~40MHz bandwidth and in one market we have 20Mhz

9) Q: Is this net spectrum or do you have to still make provision for guard ands? A: The net spectrum

10) Q: What channel sizes do you plan to use for the WiMAX services? A: We are planning to use the 7Mhz channel size but have equipment that can support the 5,10 Mhz as well
in the light of the internet

Dr. Yonathan Mizrachi, Digital Inclusion and E-Government officer

Opening the Door to an Information Society*

*"Foris": door, opening (Translation from Latin to English)