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April 27, 2012

How Mobile Phones Can Improve Access to Services for Persons with Disabilities

Axel Leblois
G3ict

Charlotte McClain-Nhlapo
United States Agency for International Development

Douglas Goist
National Industries for the Blind

Axel Leblois

G3ict

Axel Leblois is the founder and Executive Director of G3ict – the Global Initiative for Inclusive Technologies, which is an advocacy initiative of the United Nations Global Alliance for ICT and Development. Prior to founding G3ict, Leblois spent over 20 years at the helm of IT companies in the United States. He has served as a Senior Fellow of the United Nations Institute for Training and Research and is a founding trustee and treasurer of its North American affiliate, CIFAL Atlanta. Leblois holds an MBA from INSEAD and is a graduate of Sciences Po Paris.

Charlotte McClain-Nhlapo

United States Agency for International Development

Charlotte McClain-Nhlapo was recently appointed USAID's Coordinator for Disability and Inclusive Development, where she will lead work on mainstreaming disability throughout the Agency. Formerly, McClain-Nhlapo was a Senior Operations Specialist at the World Bank, working in Africa, East Asia and the Pacific regions. She has also served as a Commissioner on the South African Human Rights Commission, Project Officer on Child Protection for UNICEF, Legal Advisor to the South African Presidency, and Deputy Chairperson of the Council of the University of South Africa. She studied law at the University of Warsaw and Cornell Law School.

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Douglas Goist

National Industries for the Blind

Douglas Goist is assistive technology coordinator at National Industries for the Blind (NIB), a Washington D.C. area not-for-profit formed in 1938 under the Javits-Wagner-O'Day Act for the purpose of creating and sustaining employment opportunities for persons who are blind. Goist works with both the federal U.S. government and private sector to help identify the most effective assistive technology solutions to maintain and increase competitive employment for employees who are blind.

Maria Stephens

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Maria Stephens is a Senior Technical Adviser with the U.S. Agency for International Development and subject matter expert in emerging payment systems risk and regulatory issues with over 18 years' experience in microfinance and financial economics. While a Financial Economist at the U.S. Treasury Department, Ms. Stephens was selected to participate in the development of policy and regulatory position papers focusing on derivatives and other related financial products and services. From 2007-2009, Ms. Stephens provided long-term technical support to the Central Bank of China and GTZ to establish the People's Republic of China's first private-sector microcredit company. She is a primary author of the USAID-Booz Allen Hamilton Mobile Financial Services Matrix and related mobile financial services risk mitigation tools and documents, and continues to lead in the development of USAID's emerging payment systems policy and regulatory agenda.

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Emerging Payments System Technology, Access, and Persons With Disabilities.

EPS Seminar, April 27
Charlotte McClain-Nhlapo
Office of Disability Inclusive Development

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Overview: a global picture.

- Disability is part of the human condition.
- 15% of the world's population have a disability.
- 80 % of whom are rural dwellers.
- Research indicates that persons with disabilities experience more barriers to accessing health care services, education, employment, financial services and transportation.
- Ageing has a major influence on disability trends and in particular on the usage of mobile technology.

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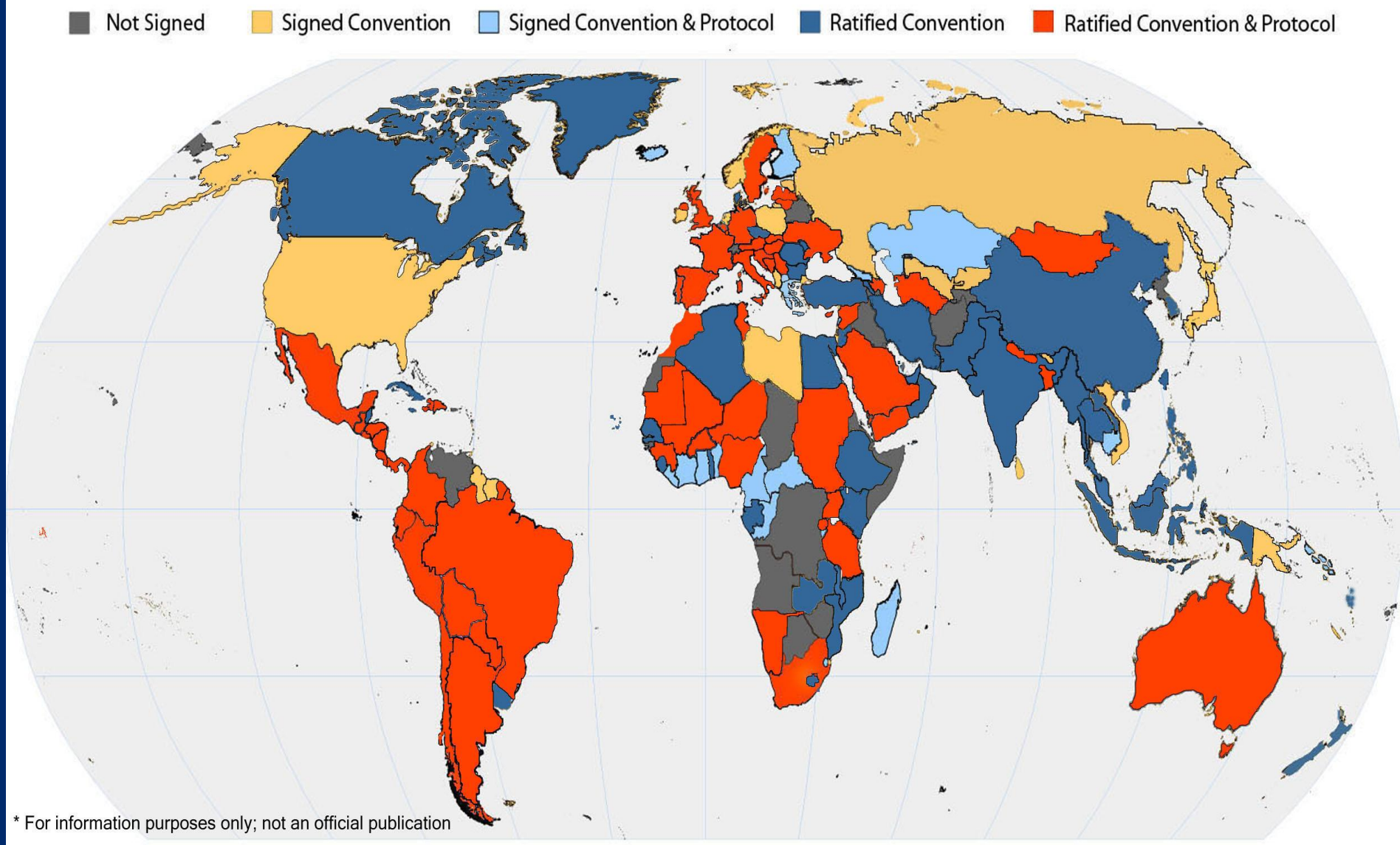

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Accessibility in the Convention on the Rights of Persons with Disabilities

Preamble (v):

"Recognizing the importance of accessibility to the physical, social, economic and cultural, environment, to health and education and to information and communication, in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms".

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Accessibility in the CRPD

- Article 9 of the CRPD defines ICT accessibility as an integral part of accessibility rights on par with all the other rights in the CRPD.

- Article 9 concerns all ICT products including mobiles.
- It addresses ICT based applications and services, with a far-reaching implication for industry, governments and persons with disabilities.

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The breadth of Accessibility in the CRPD:

- The terms “Accessibility” and “Accessible” appear respectively 9 and 17 times in the text of the CRPD.
- The term “Reasonable Accommodation” is included 7 times with equal impact on ICT applications.
- The reporting guidelines to State Parties issued by the United Nations SG mention accessibility - 57 times.

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Where are these mobiles?

- It's an odd list.
- The UAE, Hong Kong, Saudi Arabia, and Italy are near the top.
- MICs i.e. Montenegro, Bulgaria, and Brazil are all in the first 20, ahead of the UK, US, Belgium, Japan, France, Canada, and South Korea.
- Poorer countries i.e. Guatemala, Ukraine, Ecuador report more than one phone per person.
- In over a decade Kenyans who owned mobiles went from 3% to 93%.

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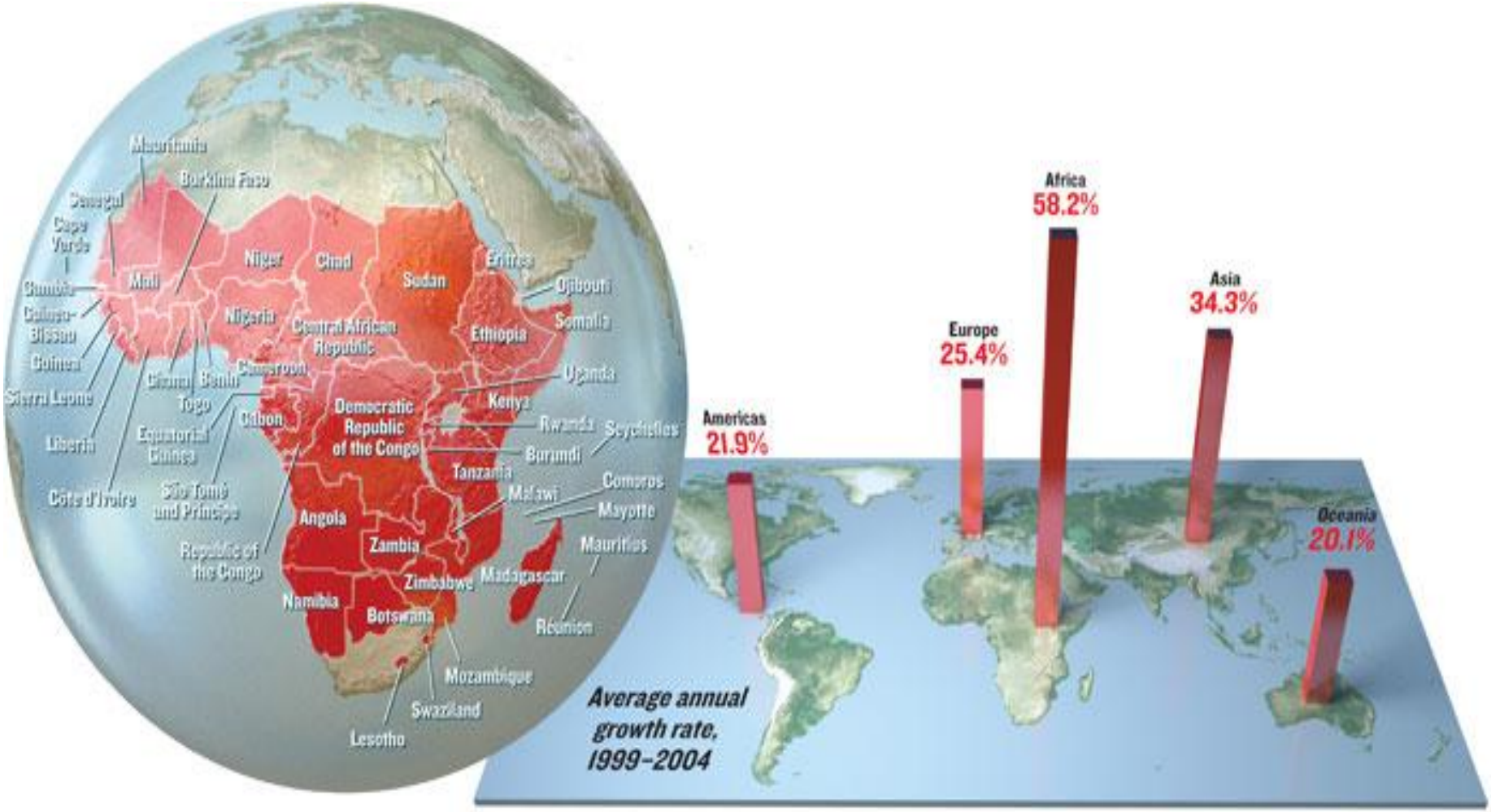

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Here's what's happened:

- The current generation of telecommunications is not only better in various ways than landlines, but considerably cheaper.
- So many countries in which landlines were beyond the means of the average worker have been obscured with mobiles over the last decade- leapfrogging the old technology.
- Mobiles are also democratizing financial markets, opening the door to faster, more equitable economic growth.

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What this means operationally:

- Know your customer!
- Persons with disabilities should be able to benefit from the same opportunities as others.
- Involve persons with disabilities in the design of accessibility features for mobiles.
- Encourage national or regional coordination to create common policies and practices.

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What this means operationally:

- Involve regulators and service providers in the process.
- Implement proven solutions for accessible mobile technology with large impact.
- Identify what the drivers are for growth in the mobile sector.

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This presents a real opportunity for development actors and their partners to design means through which to ensure access to services for persons with disabilities as well as bring untapped human capital resources and talent into the global economic mainstream.

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For donors:

- Seeing mobile technology as a tool for inclusion.

- Mobiles are an excellent tool for reaching the hard to reach in society.
- Champion the use mobile technology for development.
- Look to build private- public partnerships in this field.
- Help build the evidence base.

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For Governments:

- Making ICT accessible including mobiles is required by the CRPD.
- Help in reaching the unreached.
- Develop regulatory standards for customer protection.
- Untapped niche market.
- Makes economic sense.

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In conclusion:

- This is an exciting approach to using technological innovation to address development challenges.
- There still remains a digital divide between persons with disabilities and non-disabled people.
- Mobile phone technology cannot serve as the “silver bullet” for development.
- Impact evaluations of mobile phone development projects are required to better understand their impacts upon economic & social outcomes.
- Mobile phone technology must work in partnership with other public good provision and investment.

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Thank you for your attention.

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G3ict The Global Initiative for Inclusive ICTs

A Flagship Advocacy Initiative of the United Nations Global Alliance for ICT and Development

How Mobile Phones Can Improve Access to Services for Persons with Disabilities

By Axel Leblois, G3ict

A USAID Microenterprise Development Office
EPS Seminar Series

Washington, D.C., April 27, 2012

Topics

1. The Raku Raku story
2. Mobile accessibility 101
3. Assessing mobile payments accessibility
4. Suggested steps to evaluate mobile payments accessibility

1 - The Raku Raku Story 2001-2009

NTT DoCoMo Market Situation in 2001

- Overall penetration of cell phones in Japan: 82.6%
- NTT DoCoMo market share: 51%
- Opportunity: rate of utilization decreases significantly with age

Decision to tackle issue across organization

- Adoption of Universal Design principles
- Applied to handsets, stores & services

DOCOMO's Hearty Plaza

docomo

We exchanged opinions with people with disabilities and universal design authorities from the stage of design and construction and developed enriched service menus and outlet design planning.

Interior, DOCOMO Shop Marunouchi in Yuraku-Cho, Chiyoda-Ku, Tokyo

Full services menu

- Sign language staff

- Concierge service

- Consultation
- English, tael, brail, tael

Shop design

- Resolved levels on floors/corridor
- Set up indoor directions
- Set up omni-counter

- Set up omni-toilet
- Directions by artificial voice guide

DOCOMO's Hearty Plaza Graphic

「"DOCOMO Hearty Plaza" won a 2004 Good Design Award

Source: NTT DoCoMo presentation at
ITU – UNESCAP meeting in Bangkok, August 26, 2009

Example of Raku Raku Accessible and Assistive Features and Services

- A large screen with large characters
- Dedicated buttons to call certain pre-recorded numbers automatically
- "Read aloud" menus and text
- Voice input text messages and email
- Access to a network of talking books (Bibulio-net) with an integrated DAISY player
- An optional bone conductor receiver to transmit sound waves directly from bone to nerve

Question to Audience

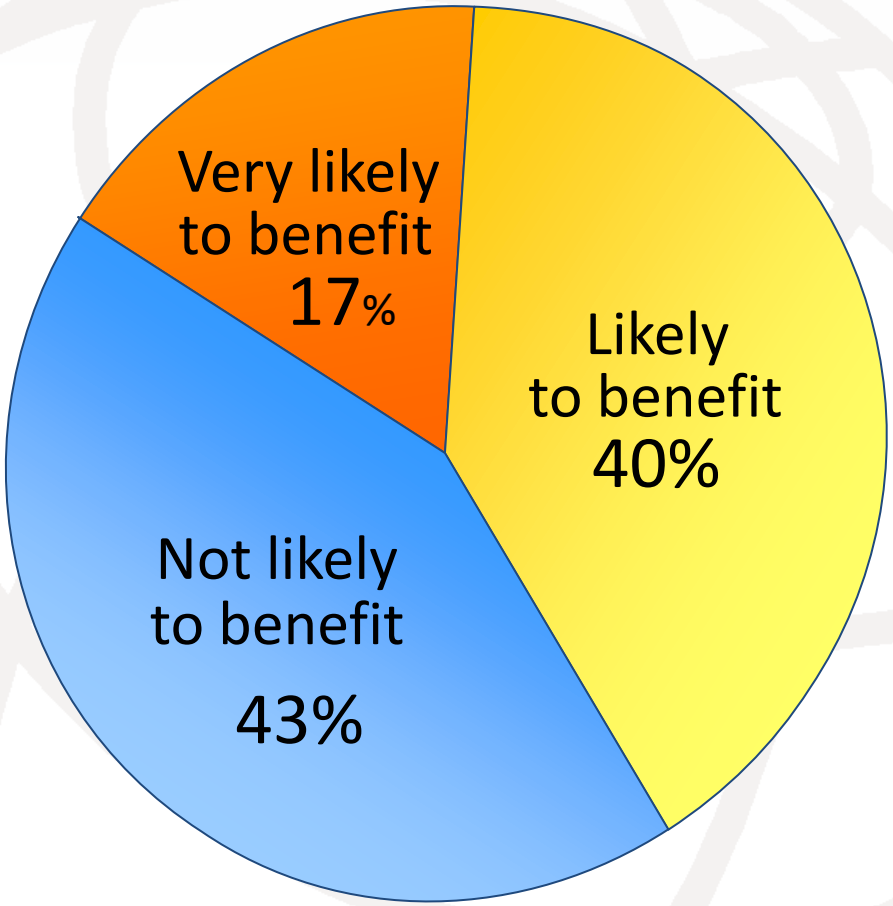
How many Raku Raku phones have been sold by NTT DoCoMo in Japan between 2002 and 2009?

Answer

How many Raku Raku phones have been sold by NTT DoCoMo in Japan between 2002 and 2009?

15 Million!

57% of Microsoft Windows Customers Likely to Benefit from its Accessibility Features



57% of adult computer users (age 18-64 in the U.S.) are likely or very likely to benefit from accessibility features

- 1 in 4 users experiences a visual difficulty.
- 1 in 4 experience pain in wrists or hands.
- 1 in 5 has a hearing difficulty.

Study commissioned by Microsoft, Conducted by Forrester Research in 2003

Other Success Stories

Service providers with programs for persons with disabilities

- AT&T - United States
- AFOM - France
- Etisalat - Egypt
- Maroc Telecom - Morocco

Common Success factors

- Universal design, understanding user's needs
- Dedicated marketing and services
- Involvement of persons with disabilities

2 - Mobile Accessibility 101

For full accessibility, users must be able to do three things for every control, instruction or output:

- **Perceive it**
- **Understand it**
- **Operate it**

Accessibility features and alternative modes are necessary for visual, auditory, speech, physical, dexterity, and cognitive impairments

Examples of Accessibility Features

Visual

- Elevated dot or audible or tactile feedback to confirm a button has been pressed

Hearing

- Visual alerts to notify the user of incoming calls/messages

Speech

- SMS with predictive text

Dexterity

- Call answered by pressing any key

Cognition

- Ability to associate photos with telephone numbers

Example of Alternative Modes

Visual
- Text-to-Speech

Hearing
- Video Relay Service with sign language

Speech
- Peer-to-peer video for sign language

Dexterity
- Voice recognition for controls and input

Cognition
- Icon interface

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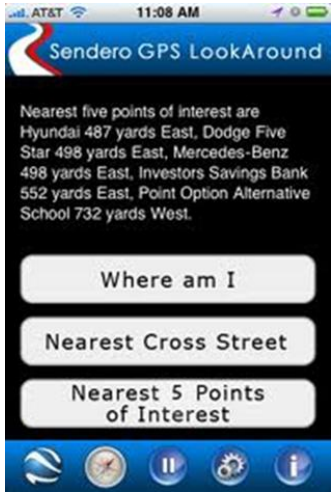
Assistive Mobile Apps for Persons with Disabilities

Economies of scale of new OS environments

Decreasing cost of processing power and memory, smart phones more affordable

New enabling mobile technologies:

- **Near Field Communications**
- **Geo-positioning systems**
- **Voice recognition and text-to-speech**
- **Advanced Optical Character Recognition**
- **New peripherals (braille input/output, switches etc.)**



Hundreds of new apps designed for all types of disability

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Examples of New Apps

- Remote house environmental controls
- Remote electronic kiosks controls
- Path finding and local services
- Money reader
- Apps for special education
- Apps for autistic children
- Mobile DAISY e-book reader
- Real time captioning

USER EXPERIENCE DEMONSTRATION

Issues for Developing Nations Mobile Users

- **Mobile markets not yet saturated provide little incentives for mobile operators to focus on seniors and persons with disabilities**
- **Availability of handsets with accessibility features**
- **Cost of high-end smart phones**
- **Lack of text-to-speech and voice recognition in many languages**
- **New OS environments bring many free or low-cost apps but they need to be localized**

3 - Assessing Mobile Payments Accessibility

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Types of Mobile Phone Payments

Four "cashless" mobile payments models:

1. **Direct mobile billing (via phone bill)**
2. **Mobile web payments (e-commerce web site transaction via mobile)**
3. **Payment via Near-Field Communications (NFC) based on pre-existing credit cards or bank accounts with special POS terminal**
4. **SMS-based transactions, which do not require bank or credit card accounts nor specialized POS – <u>works best for developing countries</u>**

M-PESA: Leading SMS Based Mobile Payment Experiment

- **Conceived by Vodafone with support of UK Department for International Development**
- **Launched in Kenya by Safaricom in 2007**
- **13.4 Million users by end of 2010**
- **70% of households in Kenya**
- **50% of the poor, unbanked and rural populations use the service**

M-PESA is an SMS based system requiring a minimum level of literacy - primary education

25,000 M-PESA agents in Kenya

Compared to Banks, Post Office branches or ATMs, M-PESA is:

- Quicker
- Safer
- Cheaper
- More convenient

Alternatives:

- 876 bank branches
- 1,025 Post Offices
- 1,424 ATMs

How Does It Work?

- To access the service, customers must first register at an authorized M-PESA retail outlet.
- An individual electronic money account is created, linked to their phone number and only accessible through a SIM card-resident application on the mobile phone.
- Customers can deposit and withdraw cash to/from their accounts by exchanging cash for electronic value at M-PESA retail stores
- Three-factor authentication makes the system very secure (SIM card + showing an ID + knowing the PIN)

How Does It Work? (2)

M-PESA retail outlets are paid a fee by Safaricom each time they exchange cash for electronic value on behalf of customers. Once customers have money in their accounts, they can use their phones to:

- **Transfer funds to other M-PESA users and to non-registered users**
- **Pay bills for goods or services**
- **Purchase mobile airtime credit**

All transactions are authorized and recorded in real time using secure SMS, and are capped at $500.


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Accessibility Factors which May Impact Usage by Persons with Disabilities

General accessibility factors:

- Physical access to M-PESA agent facilities
- Proportion of young persons with disabilities not receiving primary education and high rate of illiteracy among deaf may limit ability to use SMS

Mobile accessibility factors:

- Availability of mainstream mobile handset accessibility features
- Usage of available mobile assistive solutions such as text-to-speech (TTS) by persons with disabilities
- Secured transaction for blind persons possible with ear plug and TTS confirmation of text and numbers entered

4 - Suggested Steps to Evaluate Mobile Payments Accessibility

1. Identify available accessible handsets and assistive applications in Kenya in English and Swahili
2. Conduct accessibility tests of M-PESA with Kenyan associations of persons with disabilities
3. Share results with mobile service providers

4. Evaluate alternatives to promote accessible solutions for persons with disabilities including user training

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