



Entrepreneurship for Bottom Billions

Diju Raha & Sorin Cohn

2010 Asia Business Conference

Duke Fuqua School of Business

February 2010

- **Introduction (Diju Raha):**
Disruptive Innovation &
Entrepreneurship for Bottom Billions
- **Opportunities (Sorin Cohn):**
Cellphone as Antipoverty Vaccine –
Research Projects on Business Issues
- **Discussions (All)**

Despite \$2.5 Trillion in aid since 1950

- Billions of people below \$1/day poverty level
- High level of illiteracy
- The Millennium Declaration - 9 years afterwards...
- More than 70 countries in need of fundamental socio-economic re-structuring

Demands Disruptive Innovation

Disruptive Innovation

- **A radical departure from current thinking**
- **A quantum jump from status quo**
- **Establishes new platforms with significant impacts:**
 - Technology
 - Economic
 - Social
 - Leadership (industrial, political, etc)
- **Major examples from the past and present:**
 - The Green Revolution
 - The Growth-through-Outsourcing Upheaval
 - The Nano Disruption (in progress)
 - The Children's Machine (in progress?)

Disruptive Innovation in Agriculture

- 69 years ago Mexico Agriculture research organization requested a research grant to improve yield of wheat and maize in Mexico
- Grant application was rejected
- US. VP. Henry Wallace and Nelson Rockefeller intervened: a small research grant was approved by Rockefeller foundation mainly to avoid communist infiltration and protect Rockefeller investments
- Research proved very successful.
- 20 years later Ford foundation and later US aid and later still World Bank joined to sign a major philanthropic project known as “Green Revolution”.
- The “Green Revolution” under the stewardship Dr. Norman Borlaugh helped avoid widespread famine in India, china in 60’s.
- Initial philanthropic investment in Agriculture Research saved millions of people from starvation, poverty and spun off Multi Billion Dollar Agriculture Industry.

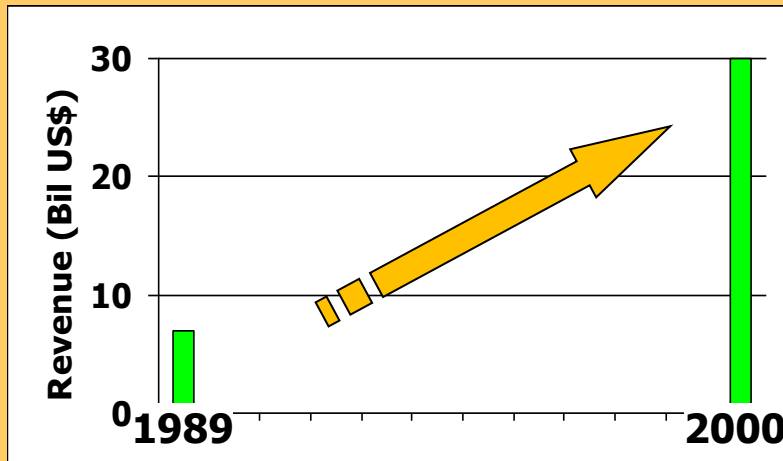
Disruptive innovation in Agriculture

Norman Borlaug signing the guest book at the Nobel Peace Center in September 2006. Behind him is Geir Lundestad, Director of the Norwegian Nobel Institute.

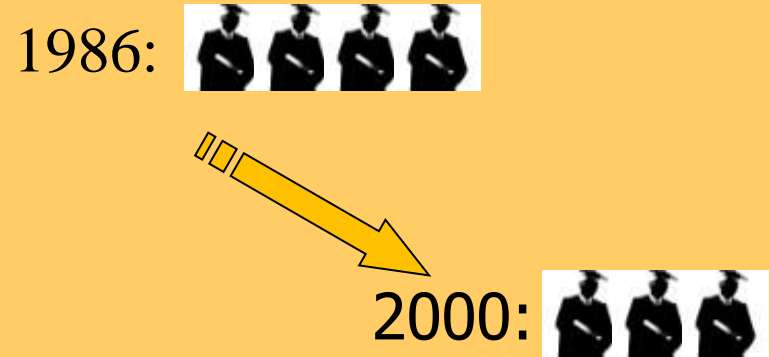


Disruptive Innovation: Outsourcing Overseas

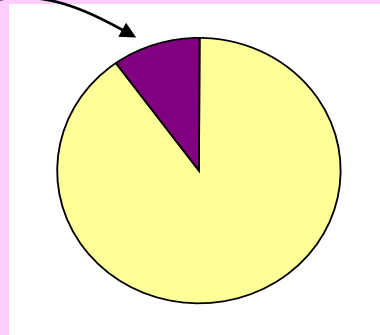
Growth goal (Nortel):



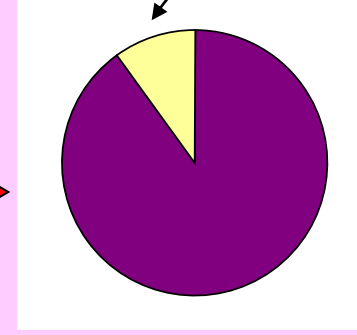
Fewer science & tech grads in US & Canada



Late 1970's:
Nortel hiring **top 10%** of engineering grads

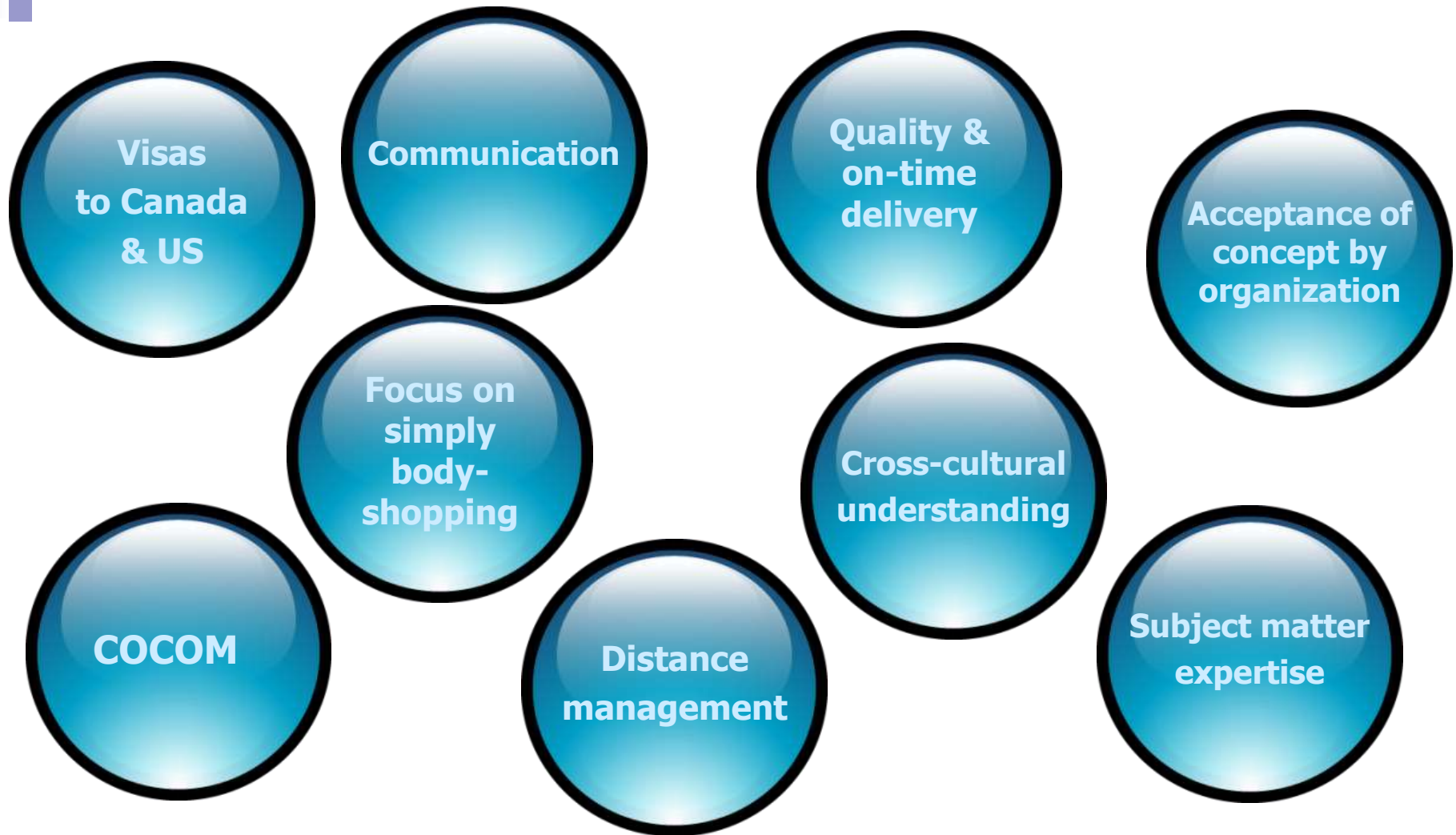


1989:
Nortel hiring **90%** of engineering grads



Conclusion: Enrich the Talent Pool
→ Nortel must GLOBALIZE

Disruptive Innovation: India Barriers in 1989

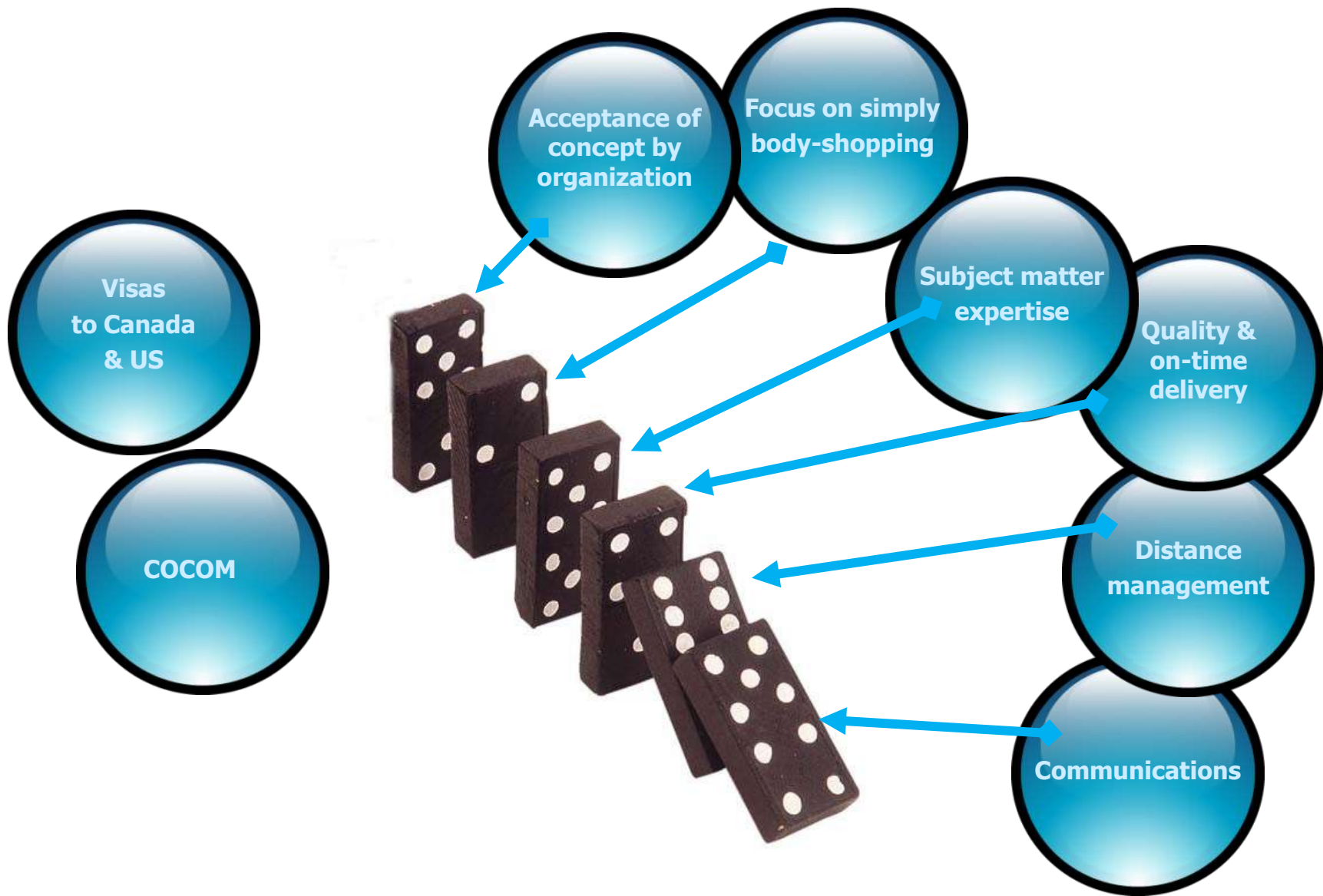


... but if the roads are paved, the Gold Rush is over!

Disruptive Innovation: challenges with telecom connectivity in India

- Highly restrictive telecom regulations
- No undersea cables; Scarcely satellite channels
- No high-speed telecom equipment
- Earth stations not maintained
- Only one telecom carrier... controlled by the Central Government

Communications makes barriers fall



Barriers fall: Nortel is the catalyst



JAMES BAGNALL
investigates
how Diju Raha
of Nortel Networks
jump-started
the sub-continent's
tech industry

—*Ottawa Citizen*, 3/12/01

- Nortel invested millions of dollar upfront, saved millions, engaged best and brightest Indian Minds for R&D.
- \$100M *body-shopping* Indian IT industry was transformed to *work-from-India*
- Is now worth \$36B... and growing!
- through Nortel initiatives

Disruptive Innovation in Auto Industry

- ❑ A car for bottom millions at the price of one lakh Indian Rupees or \$2000 US
- ❑ Initiative was launched by India's Tata motor not by established global auto giants.
- ❑ A team of 500 engineers of Tata Motors in India rigorously designed the lowest cost production car in 2009.
- ❑ Cost target of \$2000 US was met
- ❑ Mileage: 61MPG Hwy and 52 MPG in city driving.
- ❑ Commercial launch May 2009 203,000 sold to date.
- ❑ Indian auto maker, the game changer showed the global auto giants how the game has to be played and in the process is shaking the global auto industry

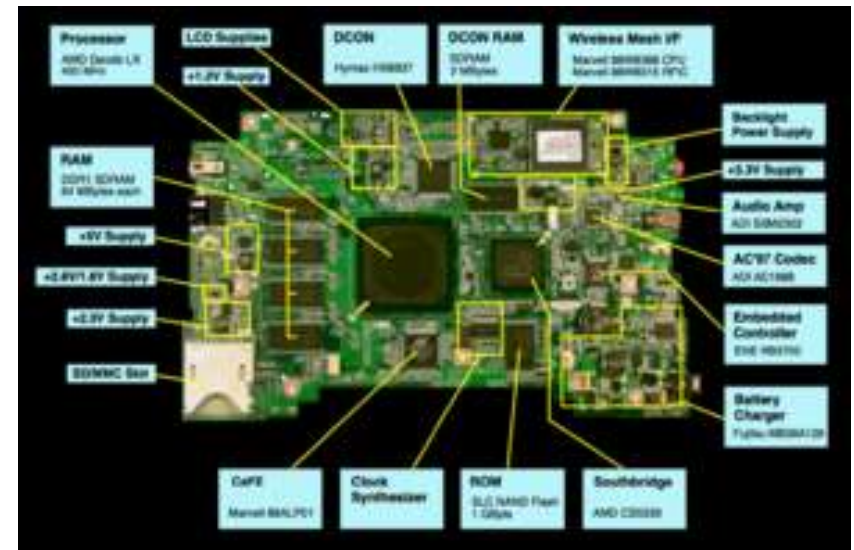
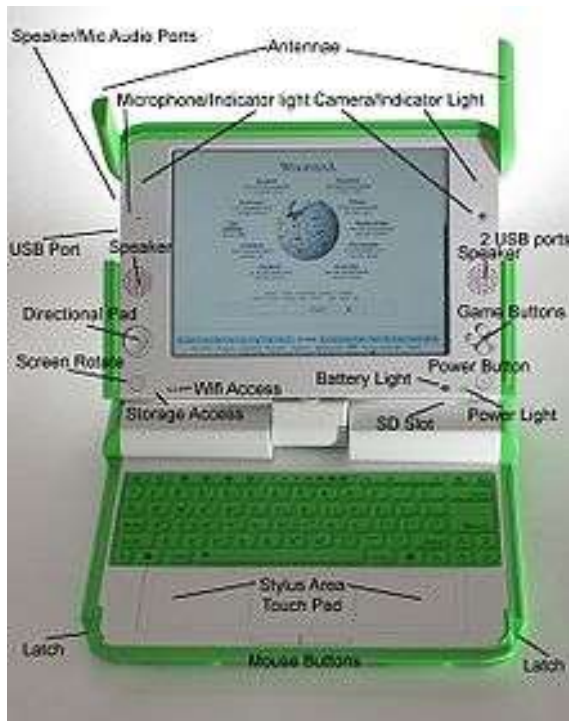


Disruptive Innovation in Computers

- The **\$100 Laptop** or **Children's Machine** is an inexpensive subnotebook computer intended to be distributed to children in developing countries
- The laptop is developed by the One Laptop per Child (OLPC) non-profit organization and manufactured by Quanta Computer
- The subnotebooks are designed for sale to government-education systems which then give each primary school child their own laptop
- Pricing was set to start at \$188 in 2006 with a stated goal to reach the \$100 mark in 2008
- The first early prototype was unveiled by the project's founder Nicholas Negroponte and then-United Nations General Secretary Kofi Annan on November 19, 2005 at the World Summit on the Information Society (WSIS) in Tunis, Tunisia
- In late 2008, the NYC Department of Education began a project to purchase large numbers of XO computers for use by New York schoolchildren

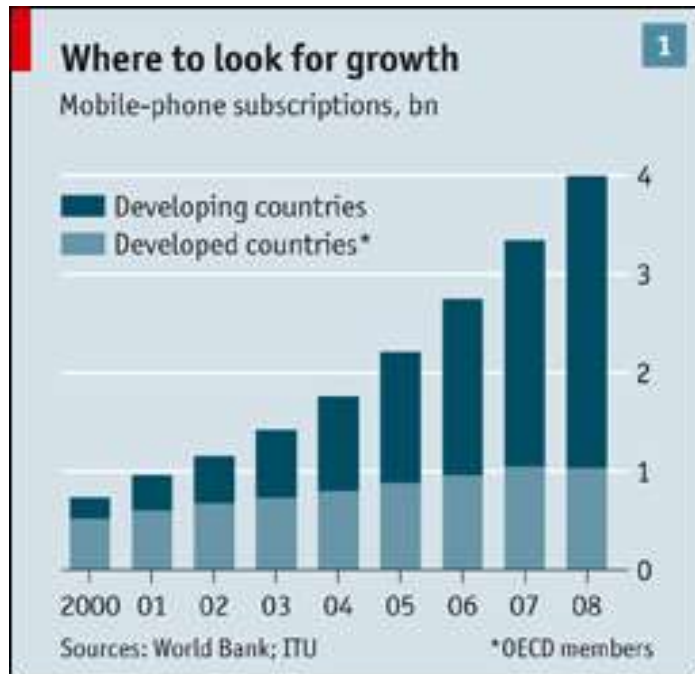
Wikipedia: http://en.wikipedia.org/wiki/The_Children's_Machine

The Children's Machine



**And, what
about the
cellphone?**

The Cellphone Growth



- ❑ Home-grown mobile operators in China, India, Africa and the Middle East
- ❑ China's two leading low cost telecoms-equipment-makers, Huawei and ZTE
- ❑ Prepaid billing systems, allowing people to load up their phones with credit
- ❑ Basic handset cost decline from \$250 in 1997 to around \$20 today
- ❑ Mobile data services growth:
 - ❖ In rich countries for multi-media entertainment and gaming
 - ❖ In poor countries more interest in instruction, health care and money transfer

Cellphone Potential: Bottom-up Examples

Mobile phones unlock entrepreneurship

- ❑ Globally micro-entrepreneurs account for 50-60% of all businesses, and in Africa nearly 90%,
- ❑ With mobile phones, basic activities such as stock handling and negotiating prices become much more efficient
- ❑ Some examples:
 1. Porters, carpenters and other self-employed workers advertise their services on lamp-posts and notice boards and ask potential clients to get in touch with them
 2. A roadside kiosk in Nairobi selling underwear and ice cream, increased income by 70% in six months after using a mobile phone in 2006
 3. Fishermen in Kerala with mobile phone calls several markets while still at sea before deciding where to sell which eliminated waste, dramatically reduced the variation in prices along the coast, brought down consumer prices by 4% and increased fishermen's profits by 8%.
Mobile phones paid for themselves within two months

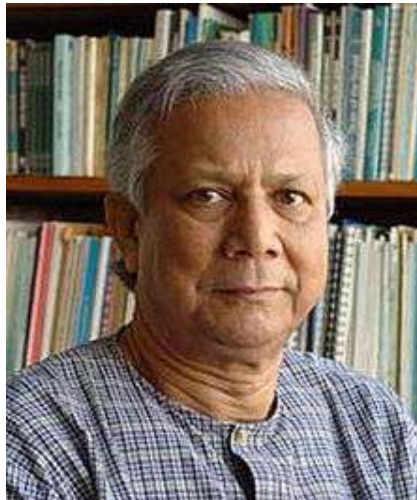
Cellphone Social Change Examples

Mobile phones empower people economically and socially, and enable “civil society”

- ❑ Election monitoring in countries like Nigeria, Kenya and Sierra Leone:
 - ❖ Reporting vote totals by phone from polling stations to local radio stations makes it harder to fiddle the results later.
- ❑ Cellphone SMS to co-ordinate and report political protests in many countries
- ❑ Mobile phones used to root out corruption in more direct ways.
 - ❖ Zubair Bhatti, a Pakistani bureaucrat, asked all clerks in the Jhang district who handled land transfers to submit a daily list of transactions, giving the amount paid and the mobile-phone numbers of the buyer and the seller.
 - ❖ He explained that he would be calling buyers and sellers at random to find out whether they had been asked to pay any extra bribes or commissions.
 - ❖ When charges were subsequently brought against a clerk who had asked for a bribe, the others realized that Mr Bhatti meant business
 - ❖ Jhang model, as it is now known, is being adopted in other districts. “It could easily be institutionalized with a call centre”

Cellphone Potential for Disruptive Innovation

“When you get a mobile phone it is almost like having a card to get out of poverty in a couple of years.”



Muhammad Yunus,
2006 Nobel Peace Prize
Grameen Bank in Bangladesh

How can YOU participate in the business evolution and spread of cellphone services to bring entrepreneurial economical benefits and social changes to the bottom billions?

Agenda - 2

- **Introduction (Diju Raha): Disruptive Innovation & Entrepreneurship for Bottom Billions**

- **Opportunities (Sorin Cohn):
Cellphone as Antipoverty Vaccine**
 - ❖ Challenges
 - ❖ Planning for Connected Opportunities Revolution (Disruptive Innovation → Paradigm Shift)
 - ❖ Research Projects on Business Issues

- **Discussions (All)**

Cellphone Socio-Economic Impacts

- Location-Independent Access to Just-in-Time “Services”
- Cellphone changed the affluent societies behaviour: the way we interact, work and play
- Increased the GDP of every nation
- Increased the productivity of every class of users from bankers to bakers to rickshaw pullers in the third world cities

Making cellphone services available to bottom billions will:

- **Be a quantum step in alleviating poverty depravation**
- **Give voice to the voiceless and**
- **Open up unprecedented opportunities**

Citizen Services & the Bottom Billions

Massively affordable just-in-time “citizen services”
for self-empowerment out of poverty



Technology Imperatives & Challenges

■ Services Paradigm Shift

- Anywhere & Anytime: Cellular Empowerment
- “Citizen Services” for the largely illiterate bottom billions

■ Key Imperatives for Massive Adoption

- “Citizen Services” → Services Platform
- Anywhere & Anytime → Affordable Network Access
- Bottom Billions → Affordable User Terminals
- Illiterate population → Appropriate User Interfaces
- National/Regional adaptability → Socio-Political Challenges

Technology largely exists for pilot programs...

Needs evolution for massive accessibility & affordability

Services Platform Challenges

- Capacity for (tens and hundreds of) millions of users
- High speed
- Security & personal identification
- Local service adaptability
- Easy development and deployment of targeted services
- Interfaces to Government/Agencies' Systems & Services
- Iconic interaction

Network Infrastructure Challenges

- Capacity for hundreds of millions of users
- Variety of services
- User localization capabilities
- Affordable & power thrifty for sparse remote locations
 - Local non-grid power for remote base stations (10% present)
 - Low operating expenses
 - Ruggedized & self-deployable (almost) base stations
- Facilities for local entrepreneurship

Personal Devices Challenges

- Rugged (shock, waterproof, dirt, etc...)
- Affordable
- Appropriate power modalities (solar, dynamo, etc...)
- Appropriate service interfaces
 - Iconic (with potential iconic → audible transcription)
 - Language choice - translation (possibly Services Platform)
- Localization
- User-identification capabilities

A market of a few billion users warrants such devices... eventually.
But it needs a jump start to shorten its development!

Economic, Social and Political Challenges

- Bottom billions are too poor to be treated as consumers
- Traditional aid emphasized survival rather than self-empowerment
- Governance failure
- Paucity of public services & impaired access to them
- Obstacles to private initiative development
- Monetization of cell-minutes → Cell-minute Bank

There are local, bottom-up trials of services that help some poor
but no concerted effort to empower the bottom billions

Agenda

- The Cellphone and the Bottom Billions
- Challenges
- **Planning for Connected Opportunities Revolution
(Disruptive Innovation → Paradigm Shift)**

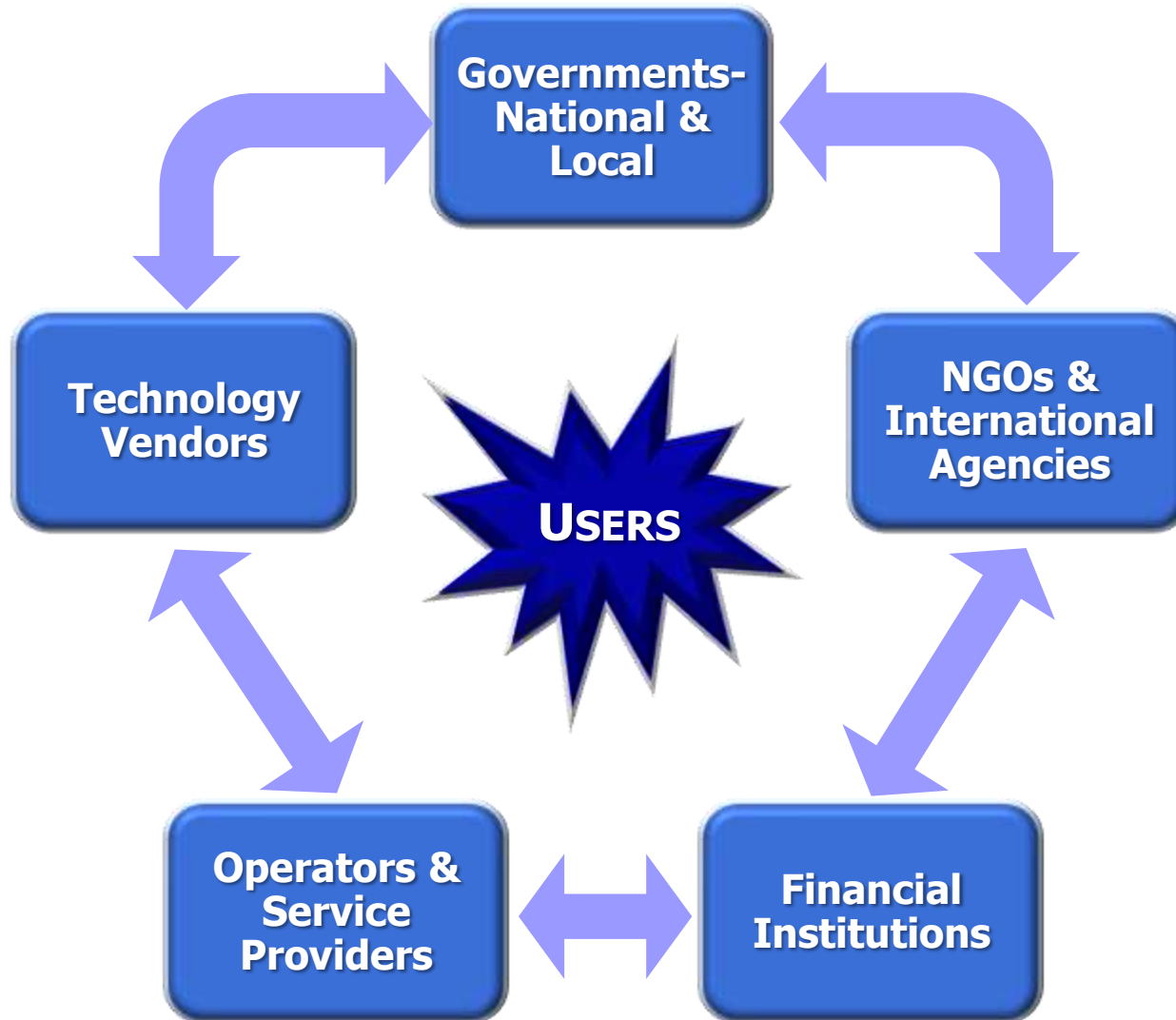
Jump Starting the Process

Provision of meaningful and cost effective services to the huge, dispersed and diverse markets characteristic for poverty stricken regions requires a departure from traditional ways to deploy viable services:

Paradigm Shift:

- From communication tool for the rich into a tool for economic emancipation and social improvement for the poor
- From “parachuted” aid to catalyzing self-improvement and entrepreneurship
- From commercial services to Citizen Services
- From generic to personal and localized services

Comprehensive Concerted Undertaking



Citizen c-Services Imperatives

■ Local Priority

- Services designed with local authorities for local needs
- Not a simple transplant of developed world services

■ Coupling with Government/Agency Resources

■ Conducive to Self-Empowerment & Entrepreneurship

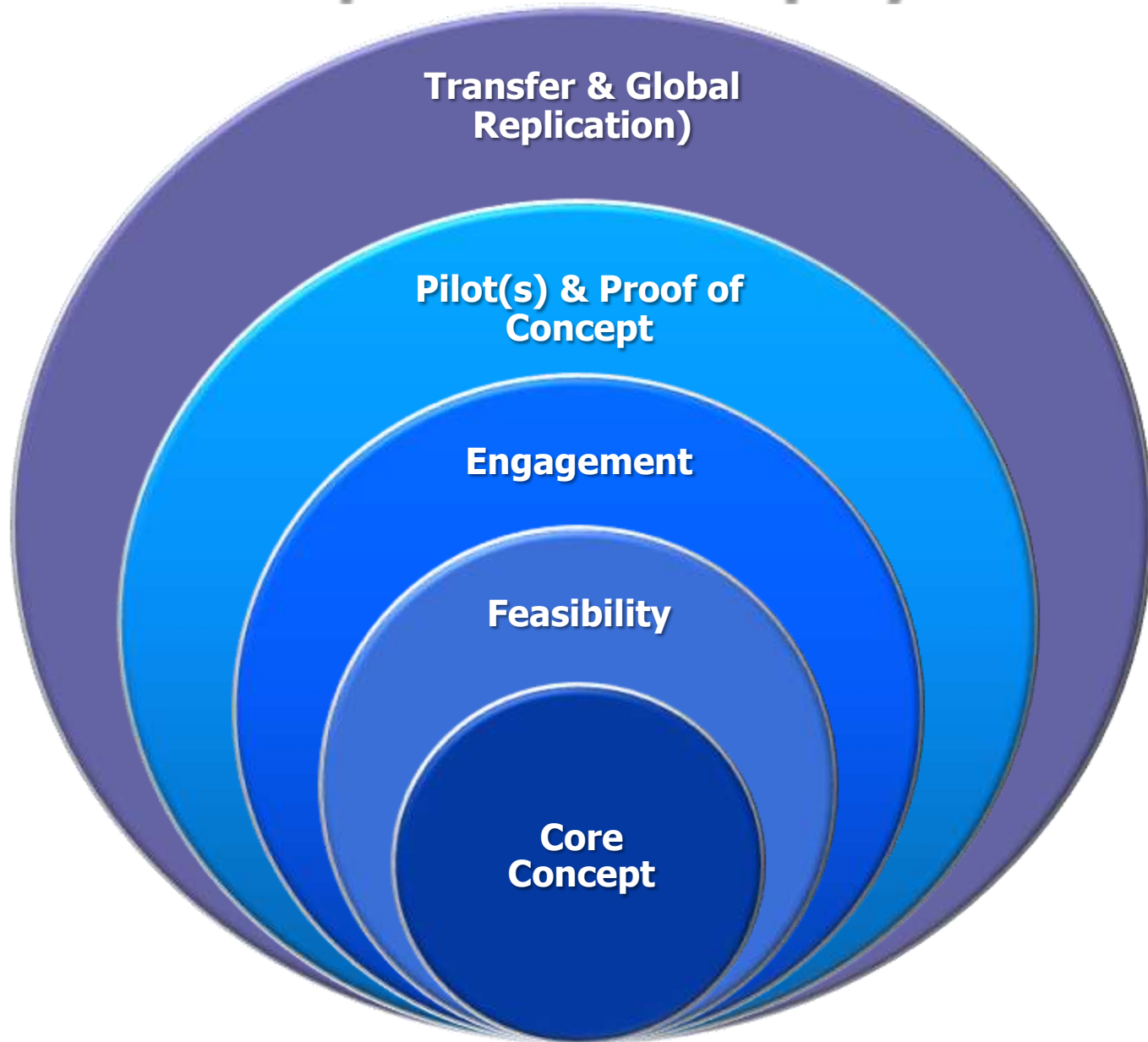
■ Personal Identification & Localization

■ Effective Monitoring and Feedback Means

■ Adaptability to Other Regions



Phase Development and Deployment



Research Project Opportunities at Fuqua

1. Constructive commitment of government aid agencies and philanthropies e.g. CIDA US AID, UN, ADB, Rockefeller, Ford foundation and others.
2. Creation of a cellphone “minutes bank” where currency is the cellphone minute
3. National regulatory issues & effective commitment of local governments
4. Economic deployment of networks in low density remote locations
5. Low cost wireless phones for illiterates – possibly icon based
6. Citizen Services: platform and tunable service opportunities with Cellular Service providers
7. Localization and User Identification as a civic or business service
8. ...

Agenda - 3

- **Introduction (Diju Raha): Disruptive Innovation & Entrepreneurship for Bottom Billions**
- **Opportunities (Sorin Cohn): Cellphone as Antipoverty Vaccine**
- **Discussions (All)**

Connected Opportunities Revolution

- There was the “Green Revolution” in the 2nd half of the 20th century to eliminate famine
- There will be the “Connected Opportunities Revolution” in the 1st half of the 21st century to eradicate poverty
 - Networks = fields
 - Cellphones = tools
 - Free minutes = seeds
 - Citizen services = irrigation systems

**VISION IS THE ART
OF SEEING THINGS
INVISIBLE**

Thank You

Diju Raha & Sorin Cohn
diju.raha@eximsoftint.com scohn@rogers.com