Rural E-commerce: Challenges and Opportunities

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Outline

- First generation E-commerce (aimed at urban areas of developed and developing countries)
- Technology requirements for next generation E-commerce (aimed at rural areas).
- Cultural, religious, and environmental challenges in rural areas.
- Impact on infrastructures and operating modalities - rural areas
- Financing and legal requirements
- Pricing structure

First Generation E-commerce Skills

- PC based internet searching and browsing skills provide access to the world's knowledge base.
- Ability to create web pages using multimedia allow communities to share creative works and resources with the world.
- Ability to collaborate using internet increases the social and economic value of a community.
- The ability to communicate and work together eliminates distance as a barrier to prosperity.

E-commerce in Rural Australia

- Lifeline for many people and communities.
- Farmers and small businesses have the capacity to present a regional image to the world.
- Create focal points for inquiries about local businesses and their offerings.
- Allows people to conduct global businesses and develop new products and services

E-commerce in Rural California

- Rural E-Commerce Grant Program was started in 2001. It provides resources for rural California communities to address the telecommunications challenges.
- More than 17 projects have been funded throughout CA.
- Technology-based economic development was the primary goal.
- Increased product sales by rural businesses.
- More work remains to be done.

E-commerce in Rural India

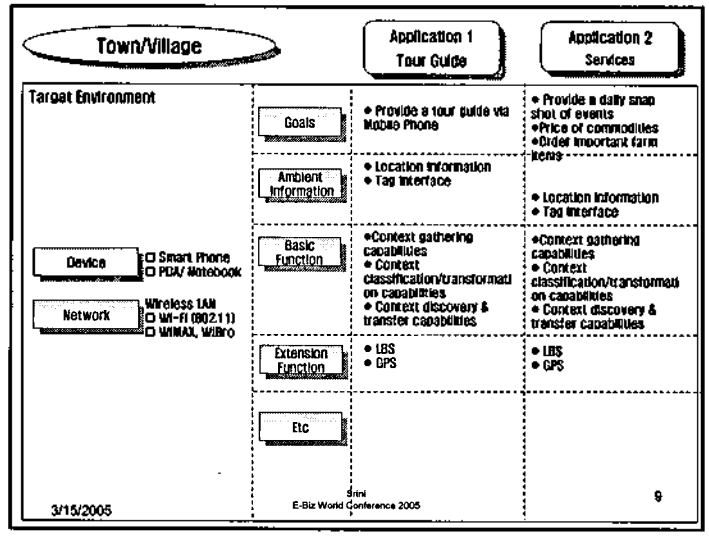
- Rural Access to Services through Internet (RASI) program in different parts of the country.
- Villages have kiosks that provide agricultural information (planting, pest control, weather, and price information) and basic tele-medicine.
- Network of entrepreneurs through cell phone to support direct sales of products made by artisans and skilled workers.
- Remote area networking using wireless packet radio modems.
- Upgrading the education standards in rural primary schools and developing innovative audio-visual presentation tools to establish after school activity

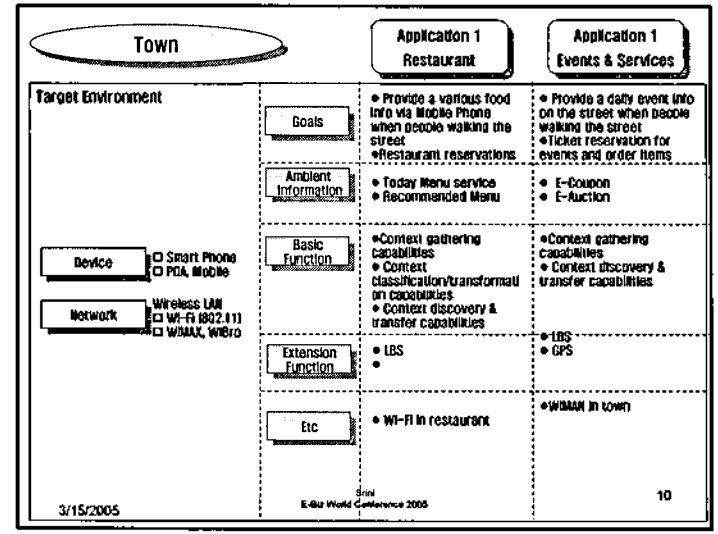
Rural Areas

- Rural mass market has numbers on its side.
- It is a long-term challenge for the PC industry to attract this segment to the PC platform.
- This market will likely choose PC alternatives, such as smartphones and thin clients.
- This group has poor communication infrastructure, low-income, and very price-sensitive.
- They lack community infrastructure, funding, communications, and reliable power sources to support PC platforms.
- Wireless communication, solar power, fuel cells and other advanced technologies can play a role.

Next Generation E-commerce

- Global – Universal Telecommunication Oriented Personal Information Access
- Local – University/Town (village) Level Object based Personal Information Access
- Use robust PDAs, smartphones, and thin clients for user interface and display in developing countries.
- Leverage mechanisms and protocols developed for Distributed and Grid Computing to obtain access to computing resources.
- Use PCs, Laptops, and other computers as intermediaries for communication and storage.





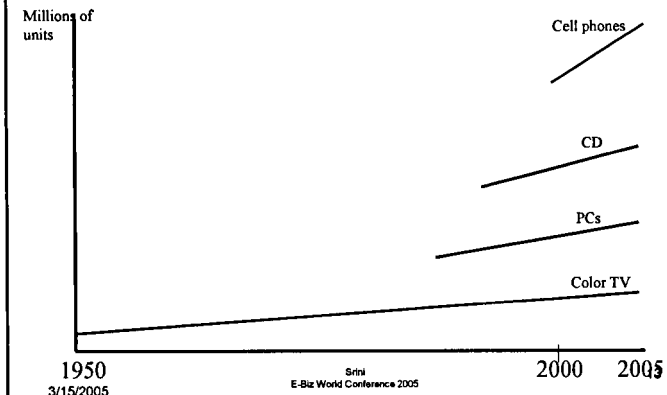
Enabling Technologies

- PCs, Cell phones, and Smartphones
- Wireless communications (802.11ag, WiFi, WiMAX)
- Low-cost sensors (GPS, digital camera, video camera, microphone, infrared camera, pressure sensors)
- Distributed real-time middleware (TMO)
- Realistic viewing on smartphones
- Grid computing
- Ad-hoc networks and mesh networks

Technical Challenges

- Diverse user interfaces:
  - touch sensitive display with stylus,
  - speech/word recognition for many languages,
  - simple machine translators for signs and posters
  - colorcode/camera combination for object recognition
- Low-cost PDAs that are reliable and robust.
- NANOS - small foot-print real-time OS that can handle the user interfaces and real-time user interactions.
- Base stations that are self-sustaining and low-cost for deployment in rural areas for high data rate wireless communication.
- Intensive efforts in modeling, analysis, language translations, and application software.
- Many field trials have to be conducted in towns, villages, and remote areas.

Growth Comparison



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Cell Phones

- 675 M units in 2004
- 580 M units in 2003
- 18% to 20% growth rate
- Nokia (30.8%), Samsung (13.8%), Motorola (13.45) are the top three suppliers
- cell phones in India - 45 M in 2004
- cell phones in China - 320 M in 2004

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Cell Phone Market for Next Decade

- More than 700 M phones in India for education and personal access
- More than 600 M phones in China
- More than 600 M phones in Africa
- More than 1200 M phones for the rest of the world
- Growth mainly due to people living in rural areas

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Brainpower Requirements

- Financial experts for developing novel approaches for funding rural entrepreneurs.
- Legal experts for developing institutions in rural areas.
- Business experts for developing business models.
- Communication and technology experts for adapting wireless technology to the rural needs.
- Programmers and analysts for modeling, simulation, and implementation.
- Sociologists and economists for planning and organizing.

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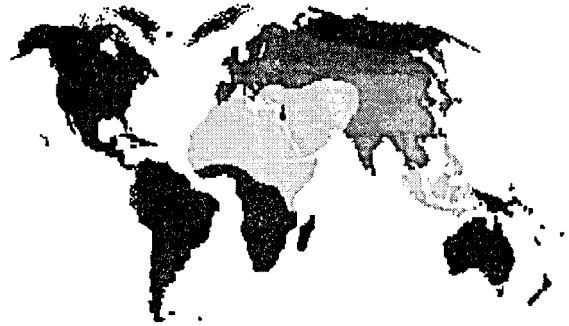
Software

- Abundance of people with basic programming skills (C, Java, DB2) in India, China,Korea
- Simple tools - Desktop computers, compilers for programming languages, user interface tools
- Outsourcing - cheaper to move software projects to places where programmers and engineers are located.
- Knowledge of how things work and terrific imagination on the part of systems analysts and programmers
- Training of new programmers and analysts using programming teams and vocational training institutions

Culture

- Cultural differences and economic opportunities resulted in conflicts, colonialism, and mutual suspicion prior to industrial revolution.
- Marginal trickling down of industrial revolution to Asia until 1940s due to colonialism.
- Benefits of industrial revolution spread to NEA, SEA, and India only in the second half of 20th century to alleviate poverty, disease, and increase agricultural productivity.
- IT revolution has the capability to promote progress in the next decade for all countries and US could provide the leadership with countries such as China, India, EU, Japan, and Korea.

World Cultures Prior to Industrial Revolution

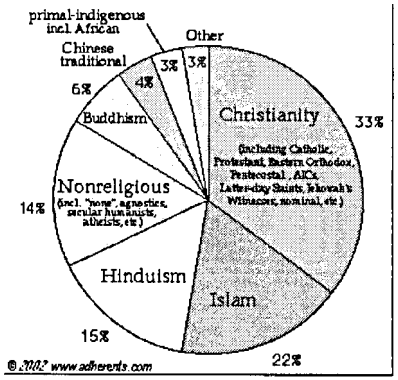


http://www.mnsu.edu/emuseum/cultural/religion/

Cultures Before Industrial Revolution

- Animism – existence of spiritual beings
- Christianity
- Hinduism
- Islam
- Judaism
- Buddhism

Pie Chart of World Religions - 21st Century



http://www.adherents.com/Religions_By_Adherents.html

Top 10 Organized Religions in the World and Impact of IT in 2004

- Christianity - 30%
- Islam - 10%
- Hinduism - 8%
- Buddhism - 8%
- Sikhism - 12%
- Judaism - 70%
- Bahá'í Faith - 15%
- Confucianism - 10%
- Jainism - 10%
- Shintoism - 7%

Cultural Challenges

- The assumption of economics (there is basic information available about the state of the market) is not true in rural areas and villages.
- Wealth and resource gap within regions, states, and among countries.
- Countries are polarized on ideological or religious grounds.Polarization within countries and within states.
- Low adult literacy rate in countries like India and large households (6 to 8 people)
- PC penetration impeded by local tariffs.
- Ratio of urban vs rural population in countries

Financial Requirements

- Capital for development must be available from many sources
- Links to world markets
- Legal protection for entrepreneurs
- Finances for domestic private businesses must be less restrictive
- Good institutions and private ownership are vital for economic growth
- Liberalized foreign direct investment (FDI)

- Provide escape mechanisms for entrepreneurs
- Provide mobility to escape inefficient institutions
- Rural and backward regions must be groomed using indigenous entrepreneurs
- FDI is an urban phenomenon and must be carefully observed
- Hospitable financial institutional environment for the countryside entrepreneurial talent

Legal Requirements

- Institute legislation to protect private property rights
- Grant rights to small scale IT industrial workers so that they can have ownership
- Income distribution will boost consumption of goods and demand for e-commerce
- Adopt sustainable growth paths for all sectors of the economy
- One nation and two systems might not be appropriate for all countries

Marketing & Pricing Structure

- Provide PCs, PDAs, handsets, or thin clients free of charge or for a nominal price and gain market share rapidly
- Fixed price for access– good for rural areas
- Price based on total time spent accessing
- Bandwidth based pricing
- Service based pricing
- On-demand TV, movies, and music

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