Mobile Web and Developing Countries

K. Gopinath
IISc, Bangalore
Drivers for a Mobile Web in India

• Cost!
  – PC cost a limiting factor in Internet's spread

• Linguistic Reasons
  – Current Internet dominated by “English” and “structured prose”
  – Mobile Web requires less “prose” but more quick and direct interactions
    • “Hinglish”/Ideograms

• Social and Environmental Reasons
  – Need an extremely simple but effective coord device
Cost

• Rs 20K (approx) reqd for a PC is still about the avg annual income in India
  – Even if bought on a loan, requires Rs 150pm interest alone on the loan
  – Since it is unaffordable except the “rich”, many services for the “not so rich” not just avlbl in the Indian Internet
    • Eg: bus schedules in Bangalore not on net as of last year
  – Usefulness of Internet to general population is a ?
  – A PC-based Internet also not very useful as most of the population does not have a “white-collar” job
    • Service sector requires mobility; a mobile Web a closer fit to what is reqd (also explains why voice mobile uptake very strong)

• Need a device close to Rs 1000-2000: only a mobile is in this range. Price of a cycle (Rs 2000) “semi-affordable”
Linguistic Aspects

- “English” infrastructure appropriate only to the top 5% of the population in India
  - Voice mobile more prevalent in small towns than Internet
- “Hinglish” (Hindi+English) etc can take root if less attention paid to “literary” style, etc
- A “sign” based lang more appropriate?
  - Pidgin and Creole resulted historically when a dominant language used in interactions with a dominated population
  - Currently, use of English in that category for the 90% pop.
- Font issues are big wrt Indian langs!
  - Need standardised ways of interoperability between “legacy” fonts
A good “coordination” device?

- Need “collective” wisdom to solve pressing probs such as TB, env. degradation, water pollution, AIDS,...
  - Success of efforts such as Wikipedia, social tagging are examples of how “small efforts” can be pooled
  - India has been doing this for many years also!
    - Coops (milk, clothing, ...)
    - “SHG”s
    - Mumbai “dabbawalas”?
    - “Pani panchayats”
  - Need to provide a coord device that bootstraps solutions for “big” problems not (yet satisfactorily) solved

- At the same time, environmentally less demanding
  - Less load compared to PCs or older models (eg newspaper)
Environmental Impact of News Delivery

• Preliminary analysis (details in paper): *Paper route better than thru PC+Web!*
  - On newspaper (*life cycle analysis*): 3.2Wh per A4 page
  - On a PC almost double (6.7Wh)
  - On a mobile (very inconvenient right now!): 0.2Wh

• If a good number of people in a city use a PC at the same time, the electric grid may not be able to handle it (esp in Indian cities...)

Two Approaches for Delivering Content

- Make content *simpler* somehow so that the form factor of the mobile can handle it
  - Transcoding, remove “clutter”, data/voice integration for effective use of “actionable” data
  - However, non-English languages (such as Hindi, Telugu, ...) have a more complex aspect (input, fonts, search, ...)
  - Requires “intermediate” processing
    - May be non-standard and may become interoperable
    - Cannot make things *simpler*!? *i18n* more complex than ASCII!
    - Any customization involves managing the device (“sysadm”)
      - Not possible with “naive” users

- Keep mobile web experience same as on the PC
  - Is it possible? May be?!?
A Proposal

• One solution: make the mobile a “modem”
  – Use of voice and data “disjoint” functions
    • I have used a CDMA 1xRTT phone that way...
  – Need addl devices for display, etc.

• Or, make the mobile a platform a good “appl modem”
  • instead of just transmitting bits
  – Make it a “low” mgmt platform: A “thin” mobile!
  – Have ability only to display (graphics/video) data from server (resized for form factor) with all processing on servers (incl fonts, etc...), and have the ability to connect to std displays/keyboard/TV. [Use some form of “Display Postscript”/SVG Tiny]
  – Much more easy to make it a “secure” platform
    • Only need to guarantee the “thin” mobile model and its sw
  – May be less prone to obsolescence?
A Mobile = Effective “PC”? 

- With newer addons to mobiles, can be “equal” to a PC (at a much lower cost?)
  - Virtual “laser” keyboard and (?) “nano-projectors”
  - Head-mounted displays and “virtual reality env”
  - Newer types of “flexible” displays

- Once Mobile Web bootstrapped, can possibly later move to a “full” Internet once input/output problems with mobile solved using the above kind of technologies
Mobiles and “Public GIS”

• GIS-based analyses needed widescale
• However, good GIS sw typ proprietary and no economies of scale
• Need a “public GIS”
  – SVG-based GIS on mobile?
  – Mobile web the input device & possibly also output device
  – Report geo-located info (weather, medical emergencies, env pollution, biodiversity cataloging, epidemiological observations, disaster mitigation, ...)
  – May be an imp component in getting a handle on “big” probs
Enable new modes of societal interaction?

- If micropayments or "easy" (micro)coordination feasible, may enable new modes of societal interaction crucial for longterm sustainability?
  - eg. carpooling, groundwater use,
  - "Free rider" problem needs to be solved
    - An "authenticated" mobile can be a part of a solution if sufficient care is taken to preserve privacy at the same time

- Currently, not possible
  - Either sub-optimal solutions or (worse) tragedy of the commons
Conclusions

- Mobile Web a singular opportunity for developing countries such as India
- A “low mgmt” and secure platform critical
  - security and privacy needs attention
- However, from an appl perspective, unclear what direction to follow as of now given the “English” domination and the non-presentation (“invisibility”) of the non-English majority