

Mobile Web and Developing Countries

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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-presence (“invisibility”) of the non-English majority