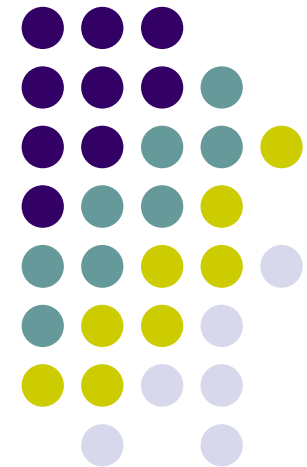


Mobile Internet for bridging Digital Divide

Sudhalakshmi Narasimhan
Midas Communication Technologies, India



Midas



Outline

- Can Mobile be PC for common man
- The Input / Output bottlenecks of a mobile
- Is there Sufficient Spectrum for Internet on Mobile?

Why have mobiles grown faster?



- Number of mobile in the world > 1.5 billion
- Number of PCs in the world < 500 million

WHY?

- Cost of mobile has stumbled from US\$ 500 to US\$ 50 in the last seven years
 - Driven by Moore's law
 - and competition
- Cost of PC (incl. software) has fallen at a much slower pace
 - Lack of competition

Handsets are reaching the common man much more rapidly

Midas

Device of the future for the common man?



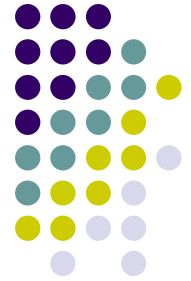
- As processing power of handsets increase, can they deliver communications applications like PCs?
 - Email
 - Information
 - Transactions

Blackberry is already replacing laptops for many professionals

- Small size – easy to carry, easy to use
- Connects anywhere, anytime

As prices fall, can these kind of devices reach a large number of underprivileged?

The Input / Output bottlenecks



- What hinders a rapid acceptance of applications delivered through mobiles?
 - Size of screen
 - Keyboard
 - Language
- Voice-enabled devices may partially alleviate problems in the future
 - But, handsets may not enable applications like document handling

New Internet applications on mobiles



- Can one hear music of choice: 30 kbps sustained?
- Can one watch video programs on demand : 100 kbps sustained?

Is there sufficient bandwidth to deliver these streaming services?

- Not in 2G (10 kbps)
- Not in 2.5G (100 kbps shared)
- Barely in 3G (several hundred kbps shared)

More spectrally efficient mobile technology required for Internet on mobile

Will operators allot more spectrum for Internet?



Operators earn from same spectrum use

- **SMS : Voice : Internet = 100 : 5 : 1.2**
 - that too assuming currently high dial-up charges for Internet
- spectrum-starved operator's **priority can not be Internet**

	Voice	SMS	Internet
<i>bitrate</i>	2x10 kbps	300 bits	40 kbps
<i>price</i>	Re 1/min	30 p per msg	50 p per min
<i>revenue per kbit</i>	5 paise	100 paise	1.2 paise

50 paise = 1 cent

Midas



To conclude

- Handsets that can deliver Internet will reach the common man faster than PCs
- Efficient mobile technologies are required to incentivize operators to deliver Internet applications on these handsets

Fixed Wireless is the best means today to connect and deliver internet applications in rural areas of the developing world