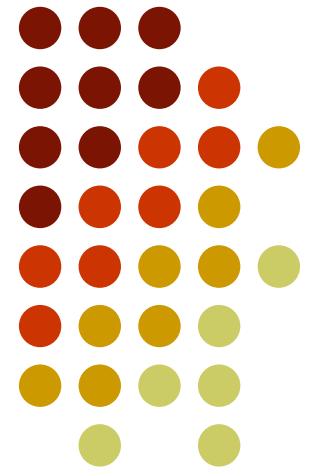


Stolen handsets

Emerging challenge in mobile markets



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Handset is the last mile of mobile phone



Sunny side of the mobile market



More than 2.3 bn people use mobile phone. **Over 2 bn GSM users until June 2006.** Operators' turnover was \$570 bn and handset makers' turnover was \$117 bn in 2005.



Current monthly intake is over 31 million – i.e., one million customers every day!
China, India, Indonesia and Russia are driving this growth.

Dark side of the mobile market



Yet more than 3 billion unconnected people live under the mobile networks' coverage.

They are from the emerging markets (Below 50% market penetration with less than US\$5.00 monthly ARPU)

GSMA says handset cost is the biggest barrier to connect them and 80% of the next billion mobile users are coming from this group.

Steps have been taken to deliver affordable handsets to these potential clients.

There is, however, no effort to protect these low-end customers' investment in handsets.

GSM Association's Universal Access agenda: Nov. 2005



1. Openness of telecom markets
2. **Lowering affordability barriers***
3. Compliance to international standards and recommendations securing interoperability
4. Harmonized spectrum and technology agnostic spectrum allocation
5. **Availability of affordable standardized high volume handsets***
6. Enabling profitable operator strategies for low-spending user segments
7. Enabling flexible options for efficient rural coverage build out including network sharing between operators
8. Converged Core with Access independent Services as long term Target Architecture

*It says nothing to protect the investment on handsets

Road to next billion customers



- Ultra-low cost handsets (ULCH) will fuel this growth.
- GSMA launched Emerging Market Handset (EMH) project in 2004. It will supply 12 million (2% of global intake) ULCH @\$40 in 2005-06.
This cost will come down to below \$30.
- ULCH sales will pass 36 million in 2007. In 2010 almost 48 million ULCH will be sold, which will be 5.3% of new device sales.

Outline of EMH project



- Operators from emerging markets are creating a critical mass of ULCH through a special procurement initiative.
- A handset specification and tender was issued - 18 vendors contested.
- Motorola won first contract to supply 6 million ULCH in February '05.
- Motorola also won the second deal for additional 6 million ULCH in September '05.

The drivers of EMH initiative



Emerging Market Handset (EMH) Programme of GSM Association	
Operator	Country
	Thailand
	India
	India
	Philippines
	India
	India
	South Africa, Rwanda, Uganda, Swaziland, Cameroon, Nigeria, Zambia, Cote d'Ivoire
	Board Sponsor & Bangladesh, Kazakhstan, Pakistan, Russia, Ukraine
	Algeria, Bangladesh, DR Congo, Egypt, Iraq, Pakistan, Tunisia
	South Africa, Congo, Lesotho, Mozambique, Tanzania

10 operators
from 27 markets

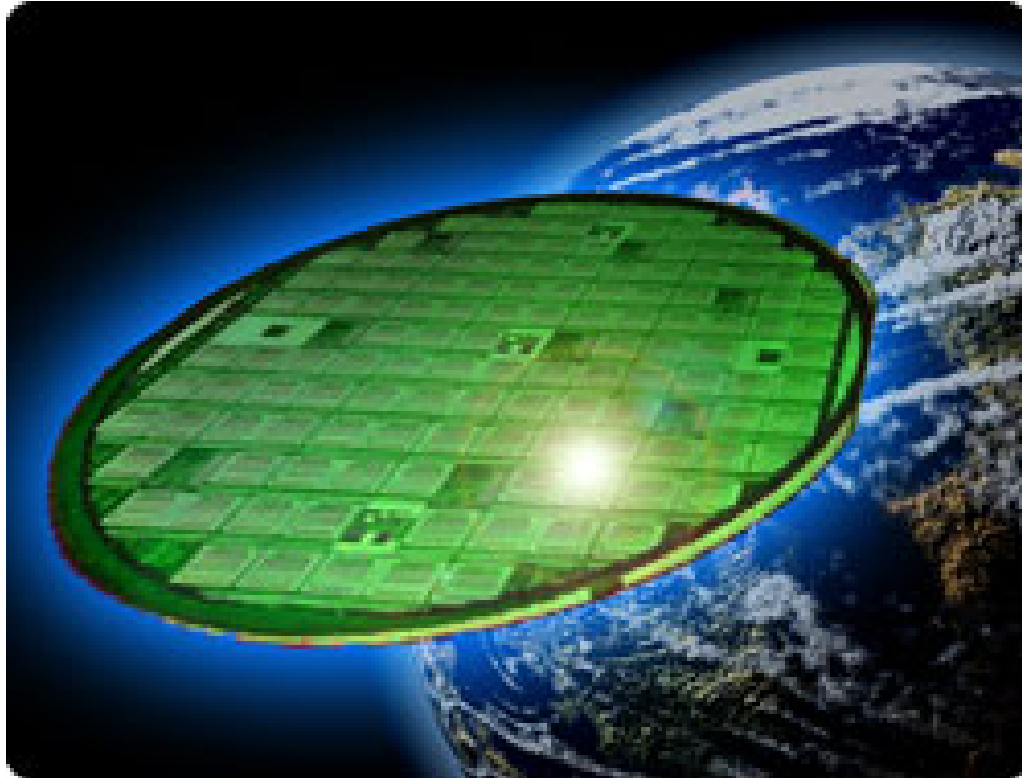
C 113x: World's first ULCH



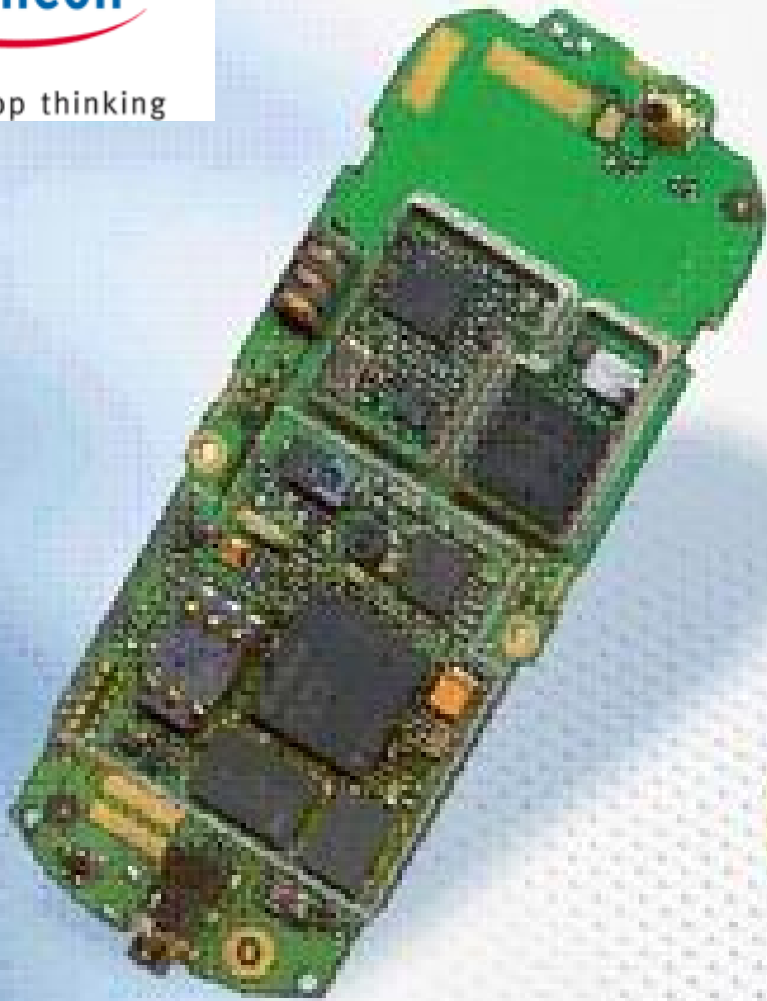
Below \$40 ex-works
12 million units to
be shipped by Q206

- Dimensions: 101.3 x 45.7 x 21.5mm
- Size: 74 cc
- Weight: 86.3 grams
- Battery: 920 mAh
- **Talk Time: 340 - 700 minutes**
- **Standby Time: 175 - 450 hours**
- Display 96 X 64 B&W
- SMS with iTAP predictive text entry
- Pre-loaded games
- Ringtone composer
- Alarm, calculator, stopwatch, and currency converter

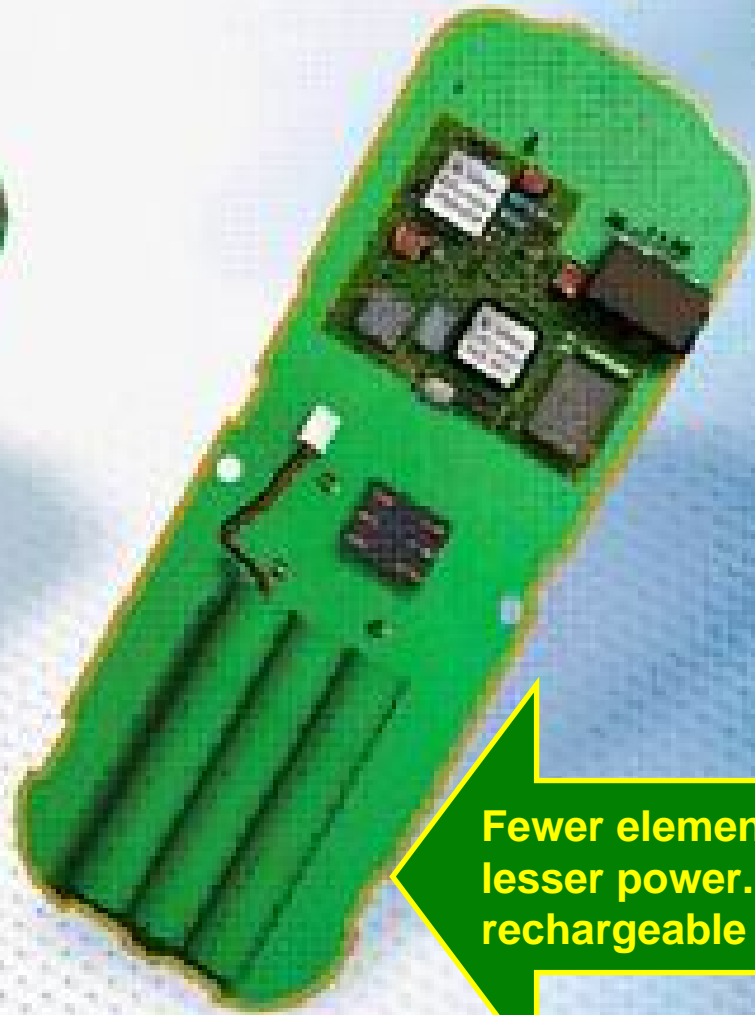
Semiconductor industry in ULCH



- ✓ Infineon's bellow \$20 and Philips' bellow \$30 platforms.
 - ✓ Both to integrate the key functions of a mobile phone into a single chip of around \$5.
- ✓ Texas Instruments has developed **TCS2010** chipset for ULCH.

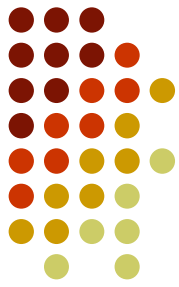


**Previous GSM mobile phone
with SMS functionality:
ca. 150 to 200
electronic components**



**Fewer elements need
lesser power. Uses AAA
rechargeable batteries.**

**Ultra low-cost mobile phone
with Infineon's ULC platform:
below 100
electronic components**

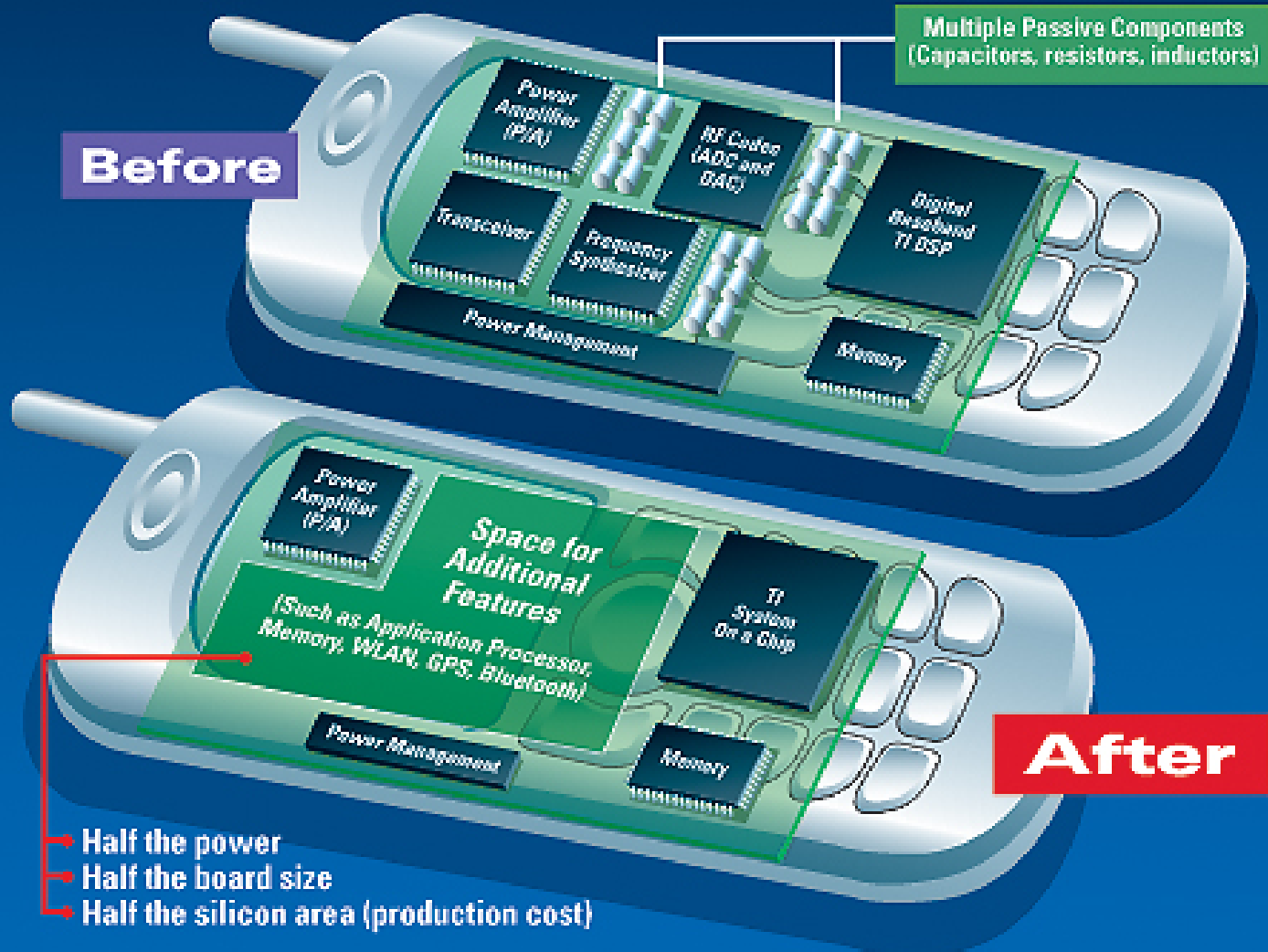


Band	GSM900 / DCS1800
Size	~90X41X15mm
LCD	1.4" 128X96 BW or CSTN
Memory	16Mb Flash ROM + 4Mb RAM
External Memory	No
Camera	No
Battery	750 mAh, Long time standby
Audio	16 poly soft MIDI
Video	No
3D engine	No
Connectivity	SMS
Others	<ul style="list-style-type: none">• Phonebook• PIM• English / Chinese input

TechFaith Wireless' ULC Reference Phone, based on Philips Nexperia 5130. Less than \$20 total phone BoM is expected by Q2 2006.



**1.8 billion+
Mobile handsets
are fitted with
TI's digital
baseband.**



"As the wireless industry continues to decrease the cost of bringing mobile telephony to these underserved regions, we will see great improvements in commerce, social interaction, and even safety,"

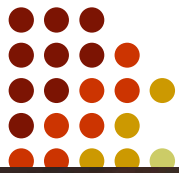
**Dr. Bill Krenik,
Wireless
Advanced
Architectures
Manager, Texas
Instruments.**

\$39 Motorola C115 for India

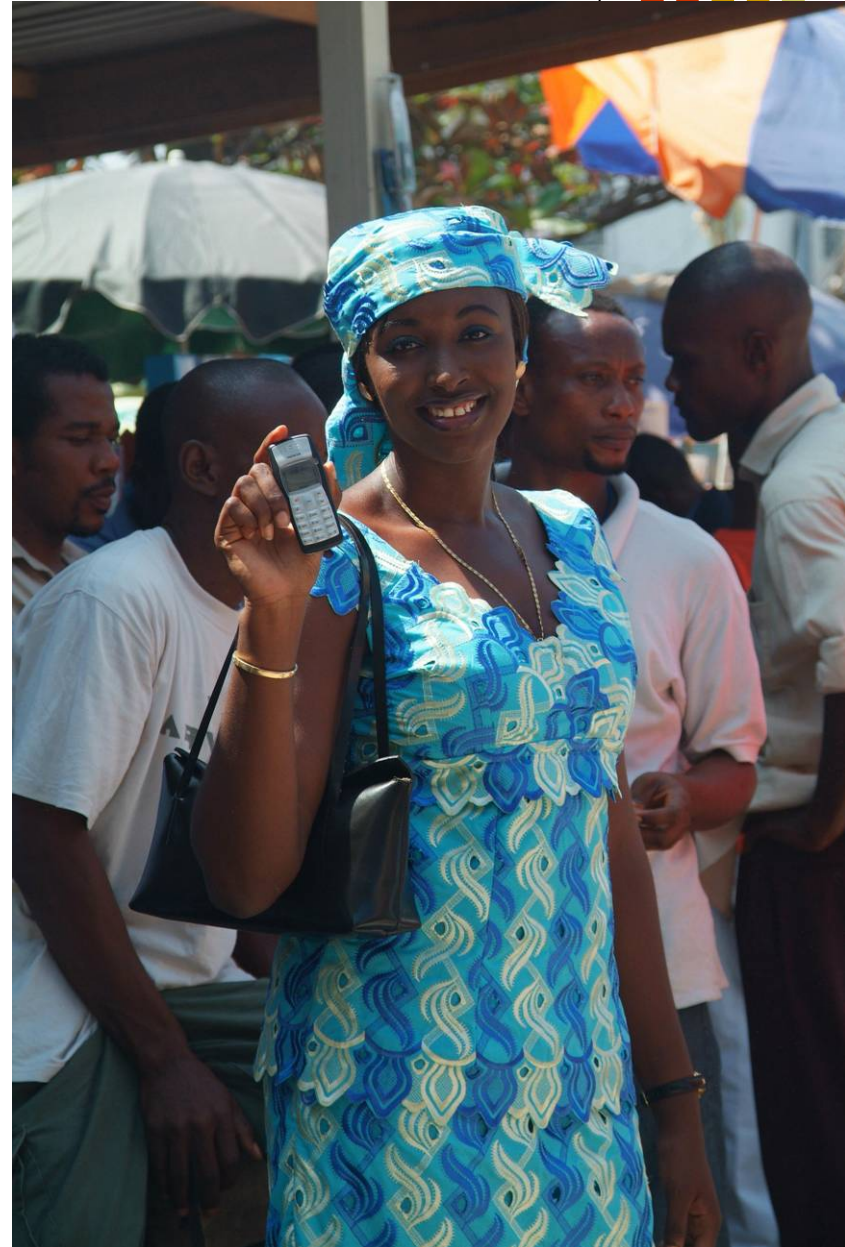


- Launched on Dec. 22, 2005.
 - Blue screen
 - Hindi messaging
 - 400 minutes talk-time
 - 340 hours standby time
- Minister gave away five units to five “Common” citizens.
 1. Nurse
 2. Wrestler
 3. Paan shop owner
 4. Auto-rickshaw driver
 5. Primary school teacher
- Each set costs Rs.1,700 (US\$39). Minister urged for @Rs.1,000 (US\$23) phone.





- In the summer of 2005, Nokia sold its one billionth mobile phone - a Nokia 1100 - in Nigeria.
- "It will be new growth markets like Nigeria that will fuel the growth towards three billion subscribers by 2010," says Kai Öistämö, Senior VP, Nokia.



CONNECTING PEOPLE furthermore



March 30, 2006: Nokia launched 2610 (€75), 2310 (€65) and 1112 (€45) models for the first time mobile phone users in the growth markets.

So what?




- Black market* sold 39% (248 million) handsets in 50 developing countries during **2004**, causing a loss of \$2.70 billion in tax revenues.
- GSM Association, 2005
- Sri Lanka had \$2.10 billion and Bangladesh had \$3.03 billion total reserves in **2004**.
- World Bank, 2005

* No reliable data says how many of the 248 million handsets are the stolen ones.

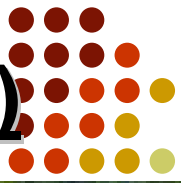
High demand + low supply = Black market (1)

Homebound euphoria during Eid holiday in Bangladesh



**Ticket
please!**

High demand + low supply = Black market (2)



Transporting stolen natural gas in rural China (National Geographic)



It's a teamwork!
See those legs?

Stop Press:



- Altogether 3,748 cases of stolen mobiles were reported in Singapore from January to September of 2005. In the same period of 2004, the Singapore police received 2,592 cases. (Channel News Asia, Dec, 6, 2005)
- More than 100,000 handsets are stolen in London every year. They are sold in at least 46 different countries including Iraq, Peru, Australia, Dubai, China and Jamaica. (BBC News, Nov. 30 2005)
- Nearly 100 mobile phones are stolen in Karachi every day. (ANI, Dec.4, 2005)

Worst case!

It's all about International Mobile Equipment Identity (IMEI) code



- Dial ***#06#** to know your handset's unique 15-digit IMEI code.
- If your handset's IMEI matches with another, that is certainly **NOT** a coincidence.
- **Either of the handset has to be a stolen one!**
- A hacker must have copied one phone's IMEI to another.

Central Equipment Identity Register (CEIR) was formed in 2004



- "The cost to operators today of implementing local stolen phone databases, on a per subscriber basis, is prohibitively high," said Rob Conway, CEO of GSMA.
- "This has been a significant barrier to implementation for many operators, in many markets of the world. Our members are in need of more cost effective solutions, tailored to the needs of their markets."
- In response, the GSMA has created GSM Technology Services, a venture with **iLabs** that offers cost effective EIR solutions together with improved functionality.
- "Over time we believe we will be able to leverage greater economies of scale to further reduce costs, and therefore improve the viability for more operators to develop their own customised databases," said Conway.

How it works?



- The database of IMEI is regularly uploaded to Central Equipment Identity Register (CEIR) .
- While connected to the CEIR, an operator downloads changes submitted by competing networks.
- Each time a mobile phone tries to access a network, its identity is checked against the operator's local database.
- **The black-listed stolen phones are denied access.**

Case study: UK



- An average of 900,000 phones were annually stolen in UK until 2002. Now it has been reduced significantly.
- Thanks to the Mobile Telephones (Re-programming) Act 2002 that came into force on October 4, 2002.
- It forbids the changing of IMEI number and possessing, supplying or offering to supply the necessary equipment with the intent to use it for re-programming mobile phones in UK.
- Yet annually 100,000 mobiles get stolen in London alone!
 - "In Iraq a new phone can cost £500, so a briefcase of stolen mobiles can be worth a lot of money. There's not a continent in this world that we have not found a mobile phone that has been stolen in London."

Eddie Thompson,
Detective Superintendent,
National Mobile Phone Crime Unit
BBC News: November 30, 2005

Remote island of good governance simply doesn't exist

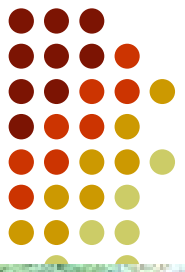


- Making the law and its enforcement through CEIR may have protected the UK mobile phone's market.
- The culprits have, however, discovered new black markets beyond the borders.
- GSM operators must get linked with a regional, if not global, CEIR.

It harms everybody

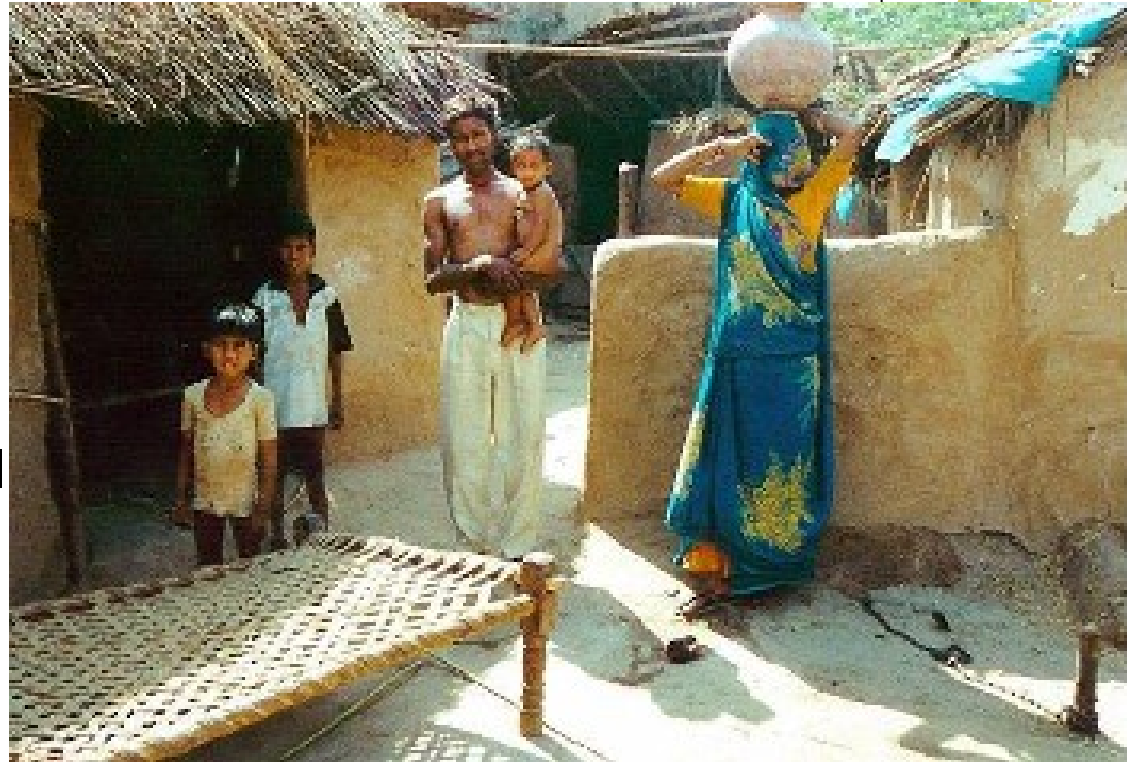


- Mobile phone is the most personal and portable device anybody has ever used.
- **Spending \$30~\$40 for a handset is still a big deal for the ordinary citizens of emerging markets.**
- **ULCH through EMH initiative alone is not a sustainable strategy for the growth.**



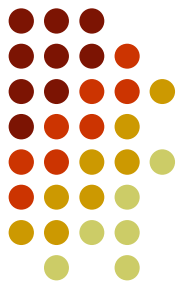
What does a stolen ULCH of Rs.1,000 mean to this Indian family?

- **Food:** How much rice or wheat can be purchased?
- **Housing:** To what extent of this house can be fixed?
- **Health:** How much of medical expenses can be covered?
- **Education:** How much the kids' education cost covers?
- **Living:** How many cloths can be bought for this family?



**Investment on
handset/ULCH has to be
protected first.**

Everybody, regardless rich or poor, is equally exposed to mobile phone theft!



Conclusion:



- **“Connecting the unconnected”** is a glamorous pre-sales campaign.
- **“Protecting the unprotected”** should be the mandatory post-sales obligation.
- Governments, Regulators and Operators are to work in tandem to ensure it.
- It's a matter of common goodwill.

Mission: Possible

Any doubt?

Any question?

