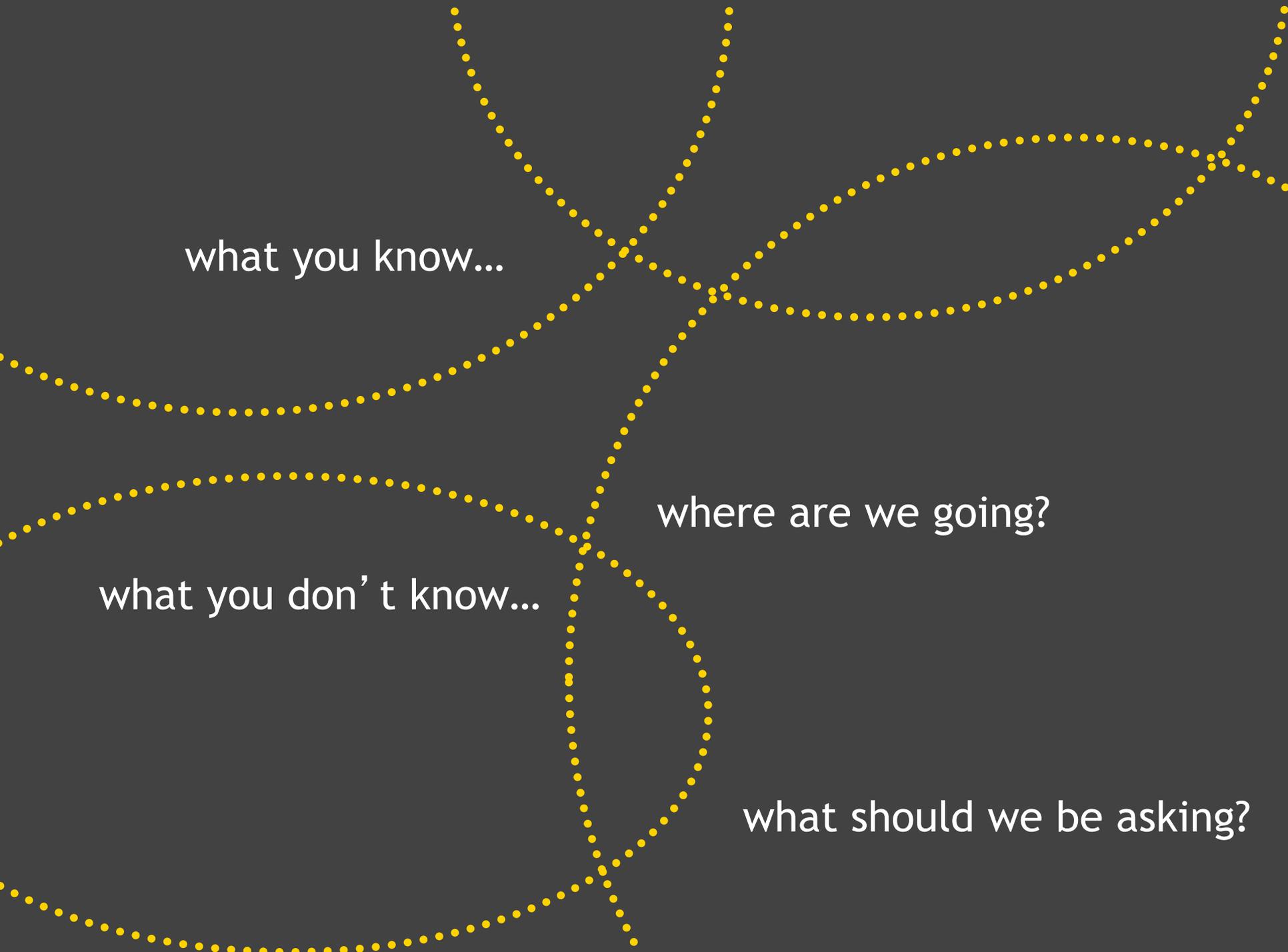


the device that  
used to be your **phone**...

---

vinod khosla, [vk@khoslaventures.com](mailto:vk@khoslaventures.com)

---



what you know...

where are we going?

what you don't know...

what should we be asking?

transport

dead or alive?

what you know...



The whole world can talk for free.

transport is dead, right?

# **\$1 trillion** spent on telecom transport last year

...so it's not quite dead, yet

- mobile transport growing 15% in 2007 to \$650B
- wireline transport flat in 2007 at \$550B

# what's next in transport:

---

working with incumbent carriers:

- do you have a choice?
- if so, when do you *want to* be carrier friendly?

how do new carriers change the rules?

---

# MoIP: Mobile over IP



((truphone))



iSkoot

different approaches: existing voice networks or all IP?

# what's next in transport:

---

- do you want a desk phone and a cell phone?  
(many younger people have already made the choice)
-

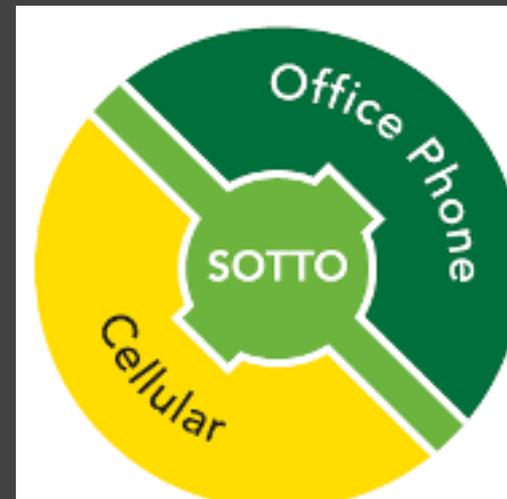
# SoIP: Services over IP

---

a sample service for small businesses:

---

- professional image + more productivity = revenue
- one simpler, cheaper landline + mobile phone



- a proven model: tens of thousands of paid business customers ... but not paying for transport

# what's next in transport:

---

- what if transport revenue didn't "die" but GREW?
  - ...and was paid for by businesses instead of consumers?
-

# business-sponsored calling

- Has this happened before? Sure.
  - Toll Free / 800 business
  - Oh, and Google



speaking of advertising

---

ads over ip are big business

---

Google™

YAHOO!

Microsoft® adCenter

# what's next in advertising:

---

- broadcast TV is free
  - tv over IP is expensive (iTunes) or illegal (BitTorrent)
  - sounds like we're missing an ad model...
    - ➔ what can IP video advertising learn from the web?
    - ➔ where else are we missing an ad model?
-

# ad-supported tv - with ip



**YuMe** Networks

- right ad, right place, right time > free (legal) video

# user generated advertising?

**Personalize a TV ad.**  
Choose an ad and make it your own.

**Select a TV schedule.**  
Choose where and when your ad will run.

**Launch your campaign.**  
Watch your business on TV.



**More exposure.**  
**More awareness.**  
**More customers.**  
Television means business.

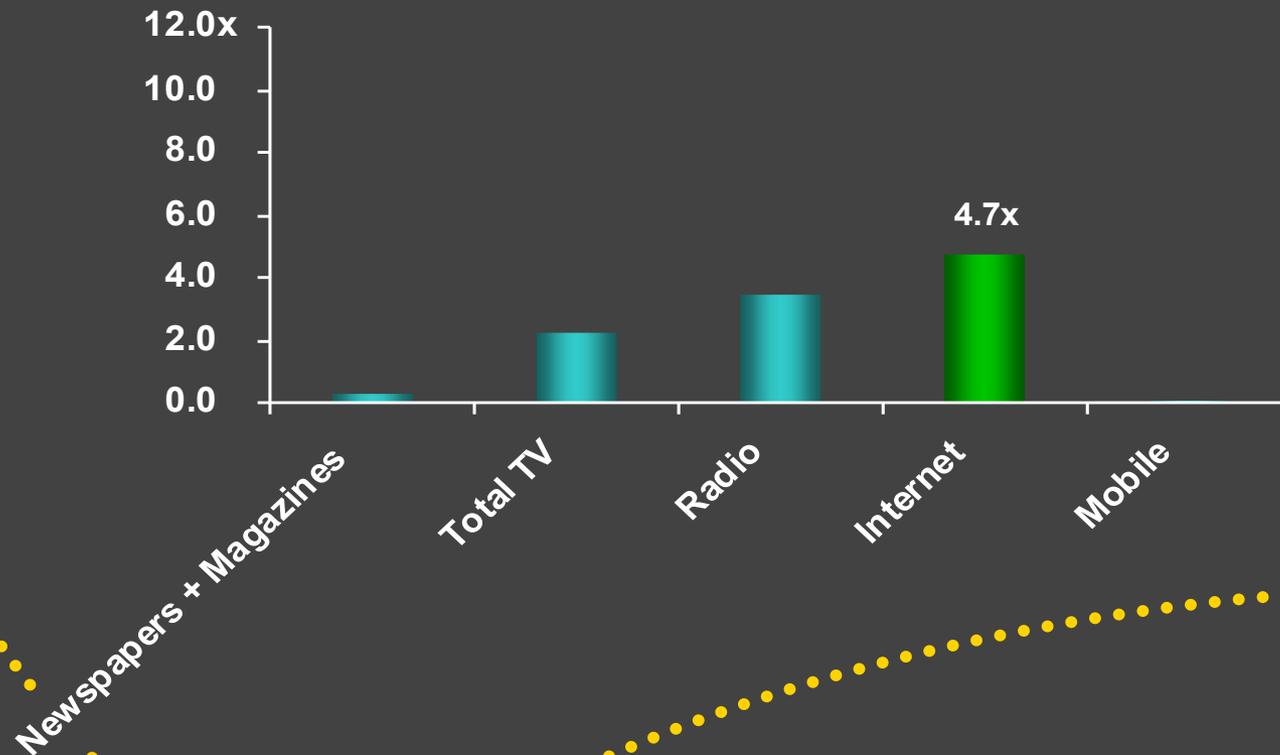
**Try it now**



- anyone can produce and post ads, best ads rise to the top
- anyone can then customize those ads

# untapped ad potential on mobile?

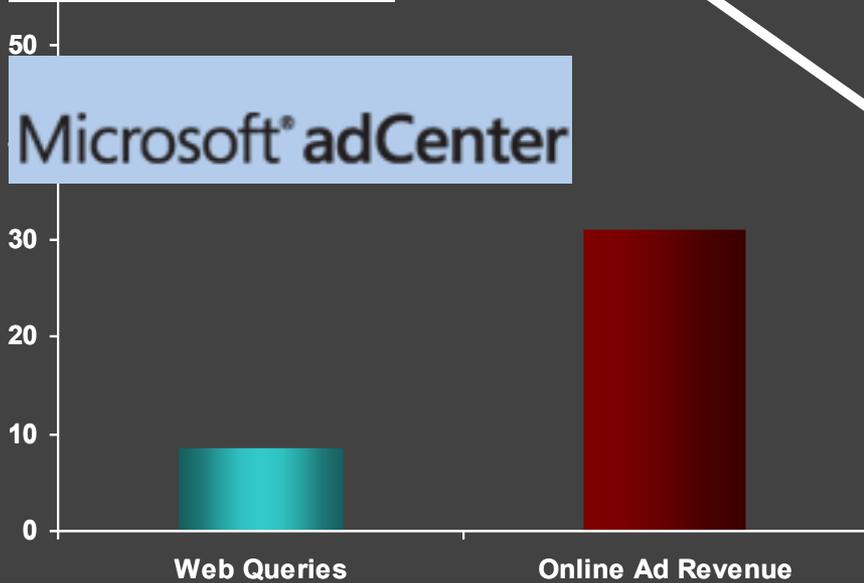
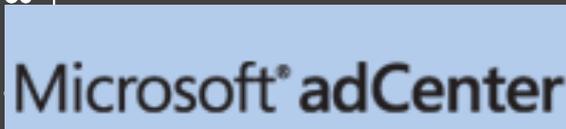
## US Media Usage to Ad Spending Ratios



# beyond ads: \$50b on SMS



Advertising

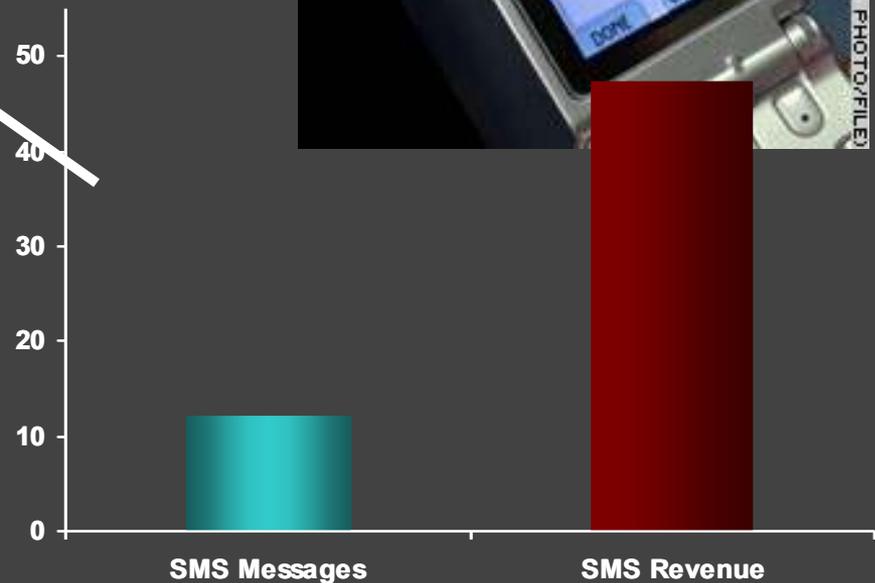


(monthly - in billions)

('06 - billions of \$)



Mobile SMS



(monthly - in billions)

('06 - billions of \$)

# viral mobile apps + mobile monetization = \$100b opportunity

**myspace.com**  
a place for friends

 Male  
27 years old  
San Jose,  
CALIFORNIA  
United States

Last Login:  
3/13/2007

View My: [Pics](#) | [Videos](#)

**Contacting Nick Argon**

|   |   |
|---|---|
|  <a href="#">Send Message</a>    |  <a href="#">Forward to Friend</a> |
|  <a href="#">Add to Friends</a>  |  <a href="#">Add to Favorites</a>  |
|  <a href="#">Instant Message</a> |  <a href="#">Block User</a>        |
|  <a href="#">Add to Group</a>    |  <a href="#">Rank User</a>         |

**Start Here** [post from Mobile to MySpace](#) 

Enter your Phone Number

**Frengo** Home My Frengo Sports Goals Casual Ambassadors Rewards

**Make your phone more fun.**

**Play More.**

-  [Sign Up](#)
-  [Play with friends](#)
-  [Win prizes](#)
- [Learn More](#)

**I Never**

Have you ever finished up all your tasks? I mean that's the only way to be a winner. Well, I never.

[PLAY NOW](#)

**More Fun Stuff**

- Plan your Night Out**  
Poll your friends on where to go and what to do!  

- Tourney Pick 'Em**  
Pick the Winners for prizes.  

- Post to MySpace**  
Post to MySpace from your mobile!  


varian | Sprint | FORTÉ | T-Mobile |  **CELLULAR ONE** | 

# 1,000 micro-content channels + mobile monetization = opportunity



[ where i am ] + [ what i like ]

Get plugged in to your local scene with our exclusive texts. No ads, no spam. Just timely insider info sent to your phone.

## 1 where i am

- + Atlanta
- + Austin
- + Boston
- + Charlotte
- + Chicago
- + Cleveland
- + Dallas
- + Denver
- + Detroit
- + Houston
- + Kansas City
- + Las Vegas
- + Los Angeles
- + Miami
- + Minneapolis
- + Nashville
- + New Orleans
- + New York
- + Philadelphia
- + Phoenix
- + Portland, OR
- + San Diego
- + San Francisco
- + Seattle
- + Washington DC
- + National

+ [ select your interest ]

## 2 what i like

+ [ get the service + FREE ]

## 3 get it now **FREE**





hardware & software:

---

inflection points

# inflection points:

---

- where does hardware hold back what is possible?
  - what kind of new businesses can be enabled?
-

youtube was a warm up act  
500+ million camera phones

Then

Now



# a problem...

---

## ...an opportunity



- An average SMS is 140 bytes and costs 10 cents, or \$750/MB
- Video recording of a rock concert is 5 gigabytes and would cost \$3.85M to upload at the same price

# is **wireless** the answer?

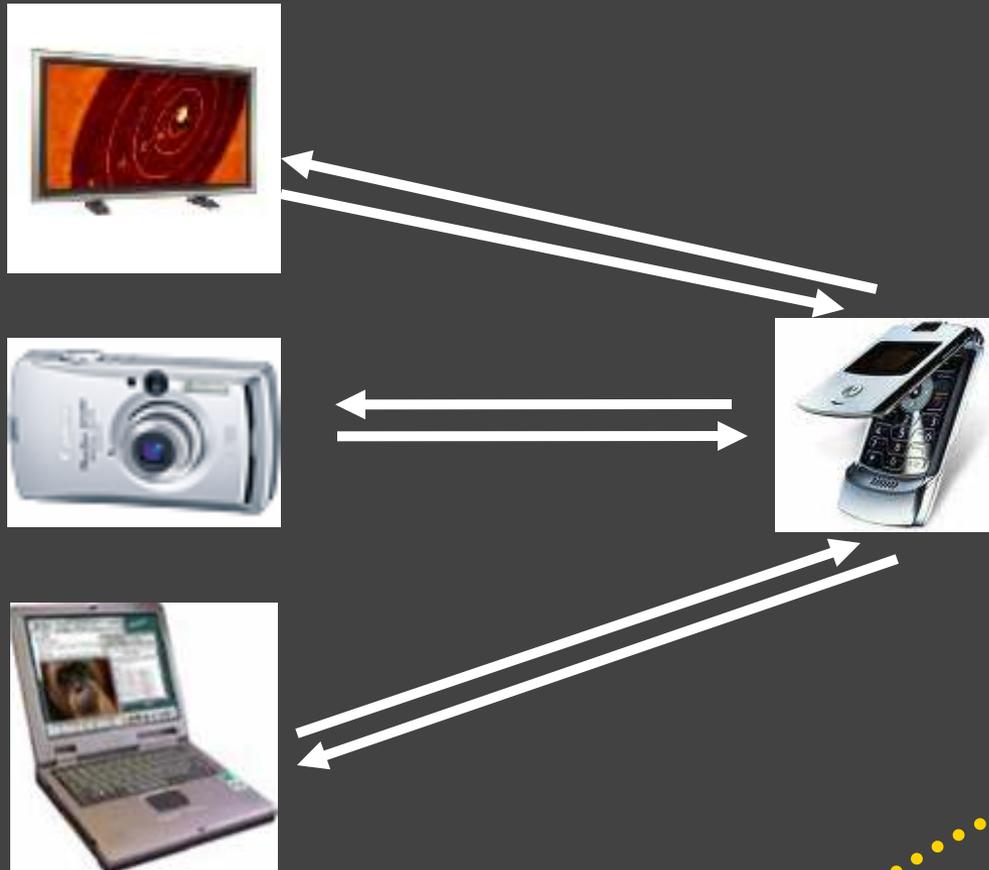
- yes, but maybe not the wireless you think



| <b>Nikon Coolpix P1</b>   | <b>Measured Throughput</b> | <b>1GB</b>    |
|---------------------------|----------------------------|---------------|
| USB2 wired                | 5.5Mbps                    | 22mins        |
| Wifi 802.11 b/g           | 2.15 Mbps                  | <b>60mins</b> |
| <b>Artimi WUSB Module</b> | <b>~200 Mbps</b>           | <b>40secs</b> |

**WUSB v Wifi**  
**90x throughput**  
**90x battery efficiency**

# one step further



100 GB on your cell phone?

# 100 GB = power drain!

---



- battery life is the biggest obstacle to these technologies
  - batteries coming soon that recharge 80%+ in one minute!
  - expect more innovation here...
-

you think you know

mobile tv



you think you know

---

the big screen



# the **new** screen

---



- your mobile device as a **full-fledged TV!**
- spatial photonics, texas instruments, microvision...

# software freed from hardware

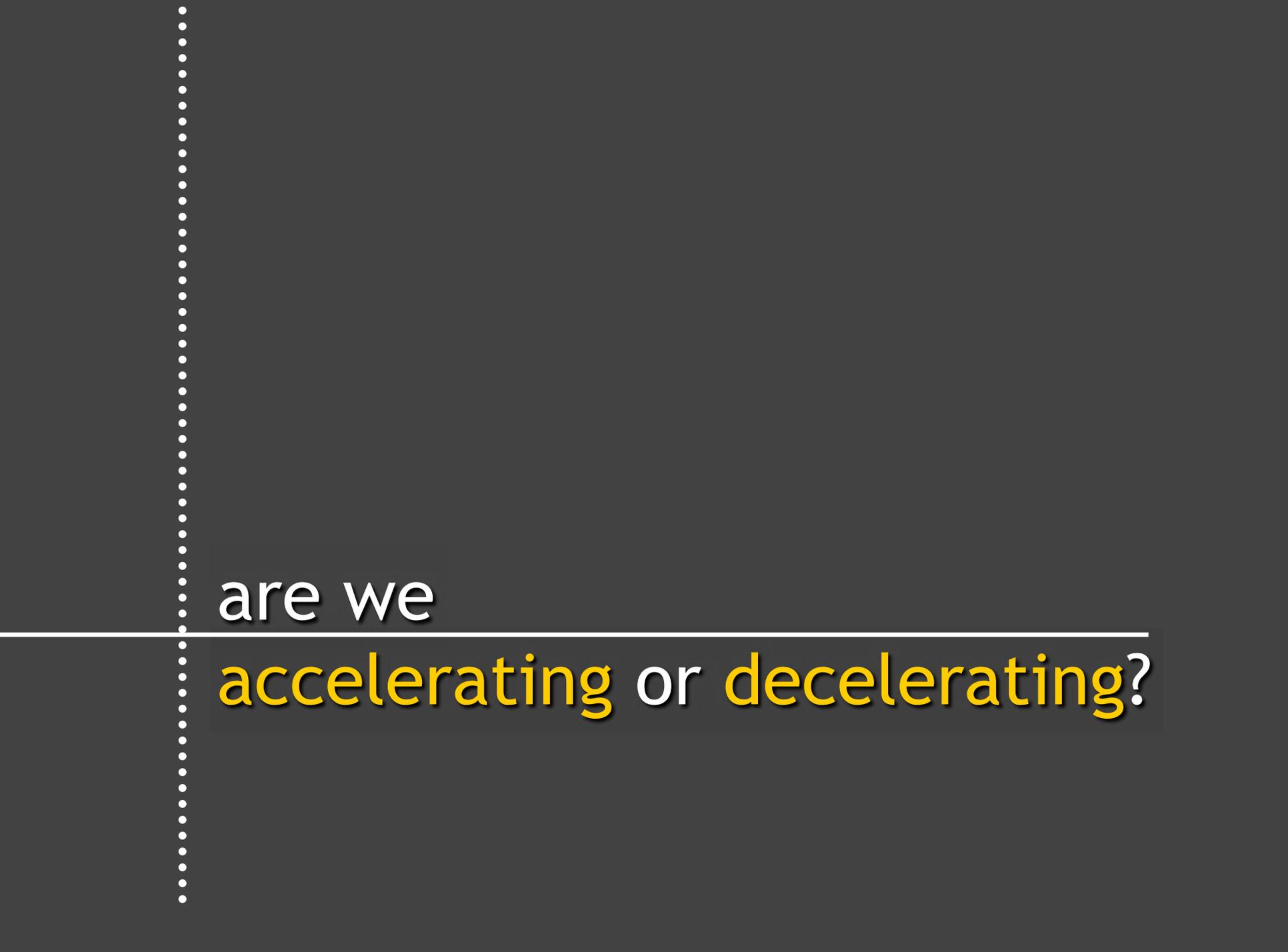
---



Moka5 allows your entire PC to be carried on your phone...  
or your “phone on your phone” (entire address book...)

---

---



are we

accelerating or decelerating?

can you *understand* me now?

---



real-time translation of speech is being developed

# telemedicine

---



- your cell phone could be as a diagnostic tool
  - care providers in rural areas could use a “Doc In a Phone”
- 
-

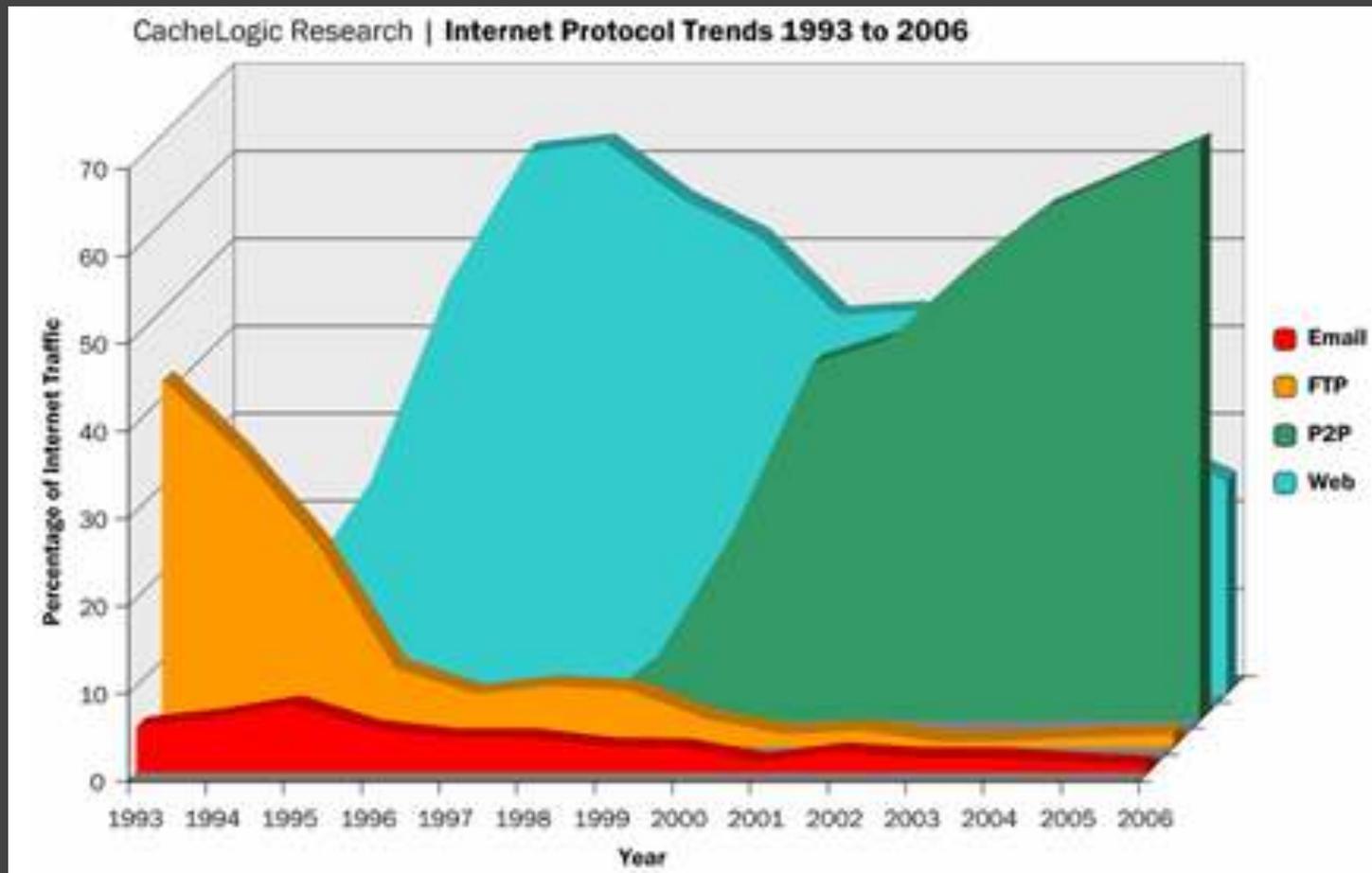
# a different kind of cockroach

---

- 1999: UUnet founder predicts silicon cockroaches will swamp internet traffic



# a different kind of cockroach



# a clean example

---

The Carnegie Mellon logo is displayed in white serif font on a red rectangular background.The eSuds.net logo features the text 'eSuds.net' in a blue, bubbly font with white highlights, set against a light blue background.

- students know machine availability via cell phones, updates on laundry status via SMS
- if this is coming to washing machines, much broader use of m2m applications not far behind

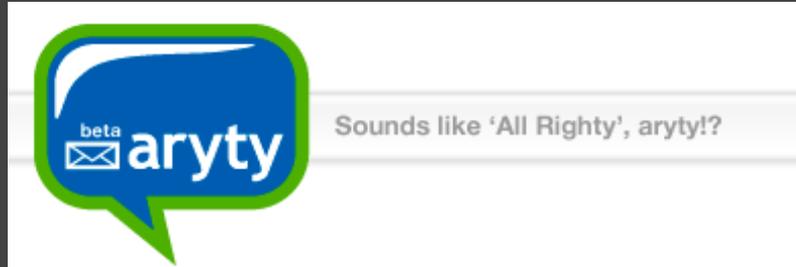
baby steps toward banking

# your phone as your **wallet**



- “your cell phone as your wallet: still waiting” (cnn)

# taking baby steps to banking

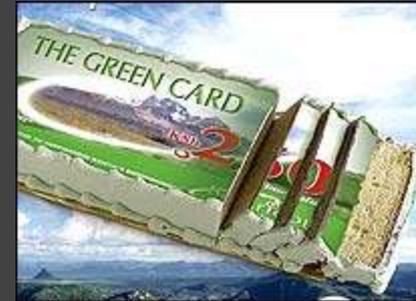


- In the Philippines, SMART Padala offers a way to transmit money from users via text messages - without bank accounts
- ARYTY allows family/friends in the US to send prepaid minutes back to the Philippines

# a new banking market

---

- In Kenya, Safaricom allows the transfer of surplus phone minutes as payments - in effect, a new currency



- 60% of mobile users worldwide are prepaid
  - 60% of \$667b  $\approx$  \$420b in minutes as a potential currency

...why give carriers all the interest?

# mobile sales **that work**



- 2D Barcodes allow quicker sales without standing in line (just point your phone at an item and go!)
- In Japan, the Felica system allows you to pay for tickets and buy food at stores
- More than 20 million Japanese consumers have phones with embedded circuitry that can function as credit cards

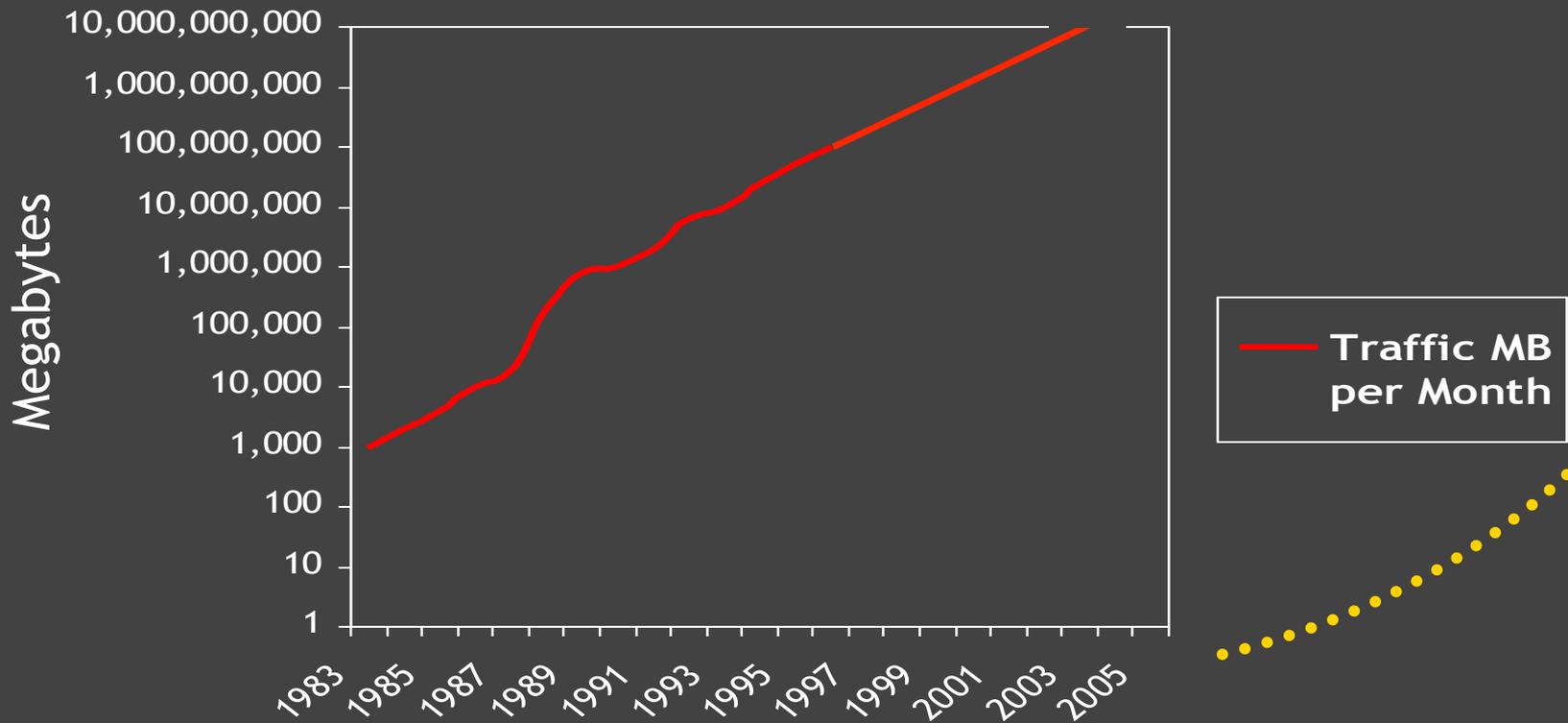
# Japanese phones are already there



- 80%+ cell phones sold in Japan have 2D barcode readers
- 27% of consumers use their phones as barcode readers, and 26% use them as GPS systems
- Moreover, a significant minority (more than 10%) use their phones as FM radios, Voice Records, and TV Tuners

# parting thought

net growth has never stopped



parting thought

---

don't bet against the net

- even in the depths of the bust, bets on IP proving out

The logo for Infonera, featuring a stylized yellow 'i' icon followed by the word 'infinera' in a bold, purple, sans-serif font, with a registered trademark symbol (®) to the upper right.

**infinera<sup>®</sup>**