towards the portable internet and the ubiquity of networks

Hong Kong Mobility Roundtable
2-3 June 2005 (Hong Kong)

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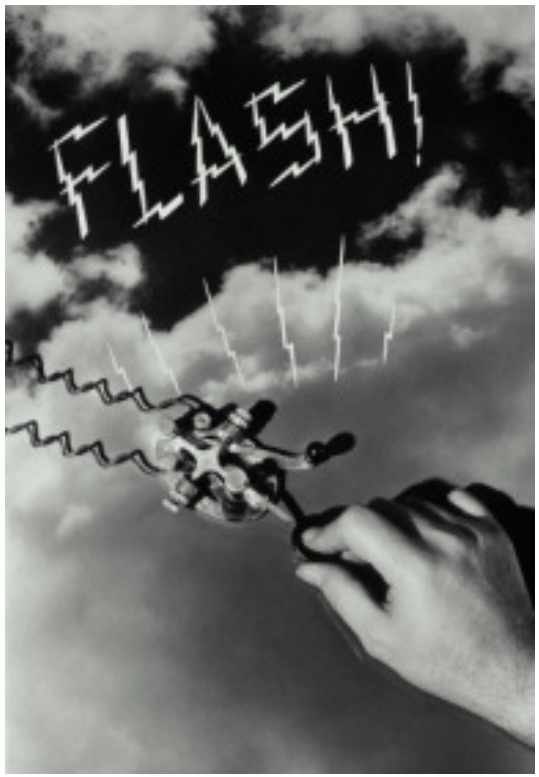
Note: The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership. Lara Srivastava can be contacted at lara.srivastava@itu.int

“what hath God wrought”…



…in 1844 - the first interurban telegraphic communication from Washington to Baltimore, ‘morsed’ by Samuel

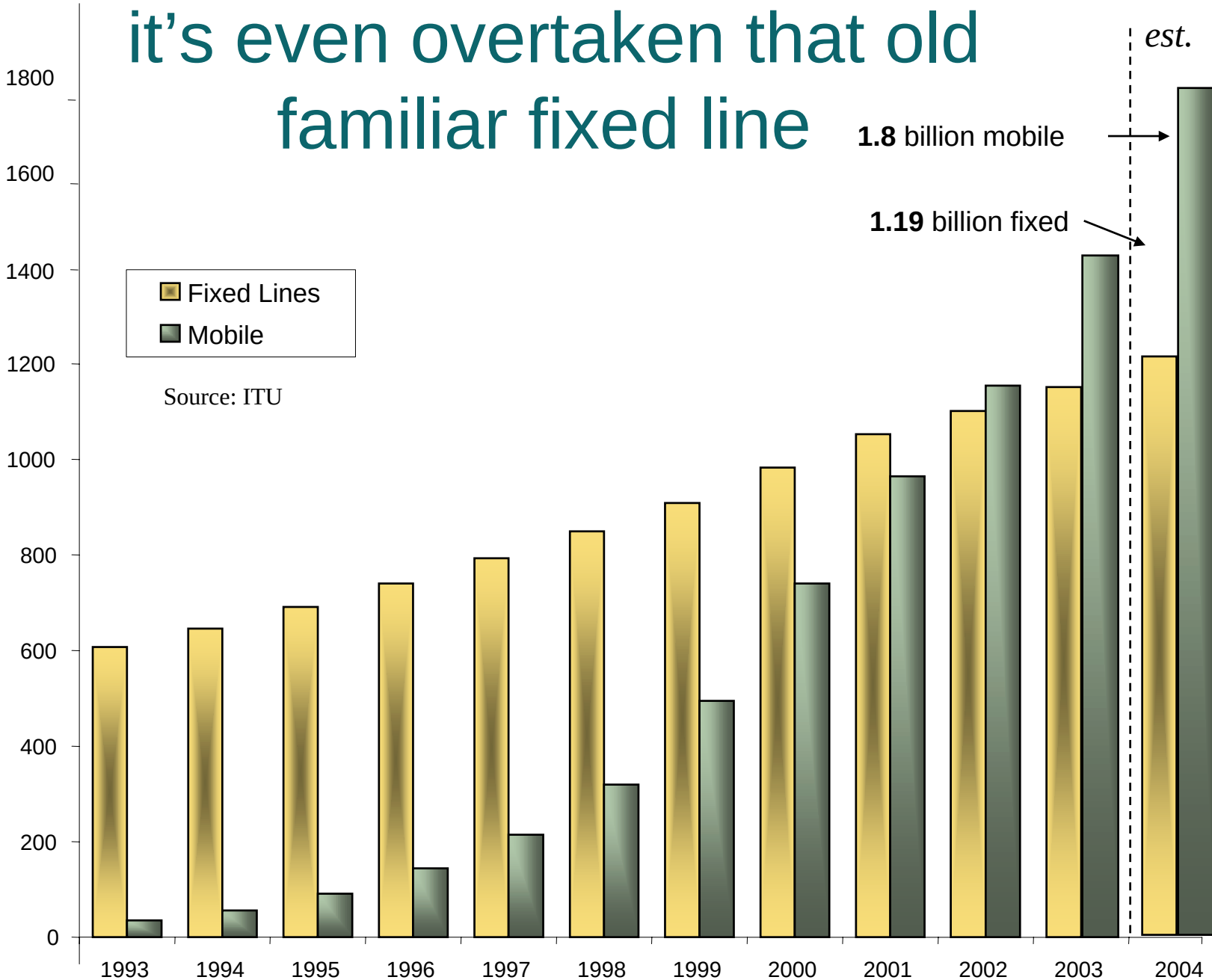
…the dawn of the information age

- the phenomenon of the World Wide Web
- the growth of high-speed broadband infrastructure
- the emphasis on “always-on” communications and information access
- the advances in computing to render networks & tech even more “ubiquitous”
- the overwhelming popularity of the mobile phone

mobility has come a long way since the days of the clunky car phone…

1910

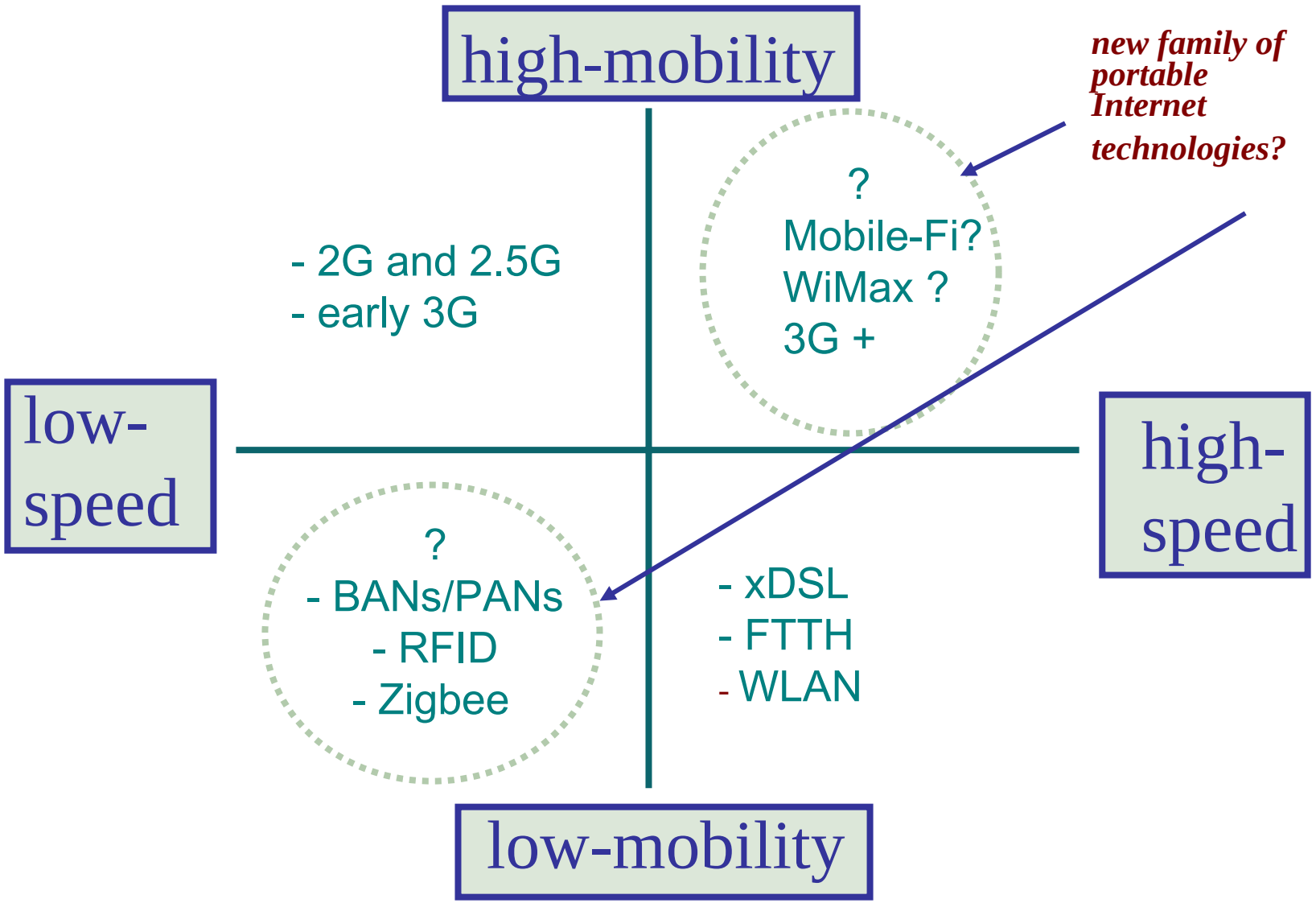
it's even overtaken that old familiar fixed line



the mobile phone and the internet – a winning combination?

- successes and failures
  - i-mode
  - WAP
- the evolution of messaging
  - from SMS to MMS
  - from still to moving
  - from store & forward to MIM and video conferencing
- portable, mobile
  - laptop, palmtop…FINGERTIP!

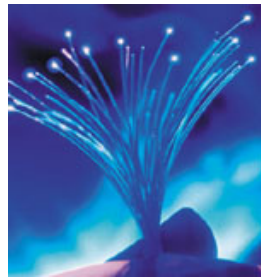
mapping mobility and speed:



higher mobility, lower speed we know about…

- Early 2G
  - dominated by GSM
  - characterized by fragmented market
  - some mobility of internet, but limited in most markets
- 2G -> 2.5G -> early 3G
  - messaging goes mobile and multimedia
  - increased accessibility, through e.g. services like Vodafone live!
  - still limited in take-up

higher speed, lower mobility we've seen around…



- FTTx, xDSL (no mobility)
- Most popular for low mobliity is currently 802.11b (IEEE) or Wi-Fi (Wireless Fidelity)
  - Range is limited (100m) but speed is high (up to 11 Mbit/s). Mostly for stationary environments
  - Advantages:
    - unlicensed spectrum
    - easy to deploy
  - Disadvantages: no dedicated bandwidth, security concerns, high power consumption
- User base (2004): 115 million users worldwide, est.

higher speed, higher mobility:

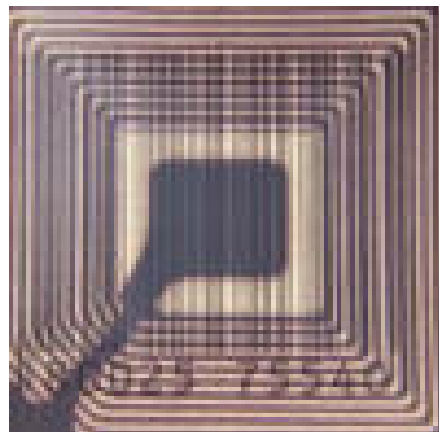
…underlying the “portable” Internet?

- enhanced 3G
  - HSPDA
  - CDMA 2000 1x EV-DV, EV-DO
- 802.16 or WiMax
  - (Worldwide Interoperability for Microwave access)
  - higher capacity: max 70 Mbit/s over 50 km
  - Type of WMAN
- 802.20 also known as “Mobile-Fi”
  - Optimized for high-mobility environments

lower speed, lower mobility:

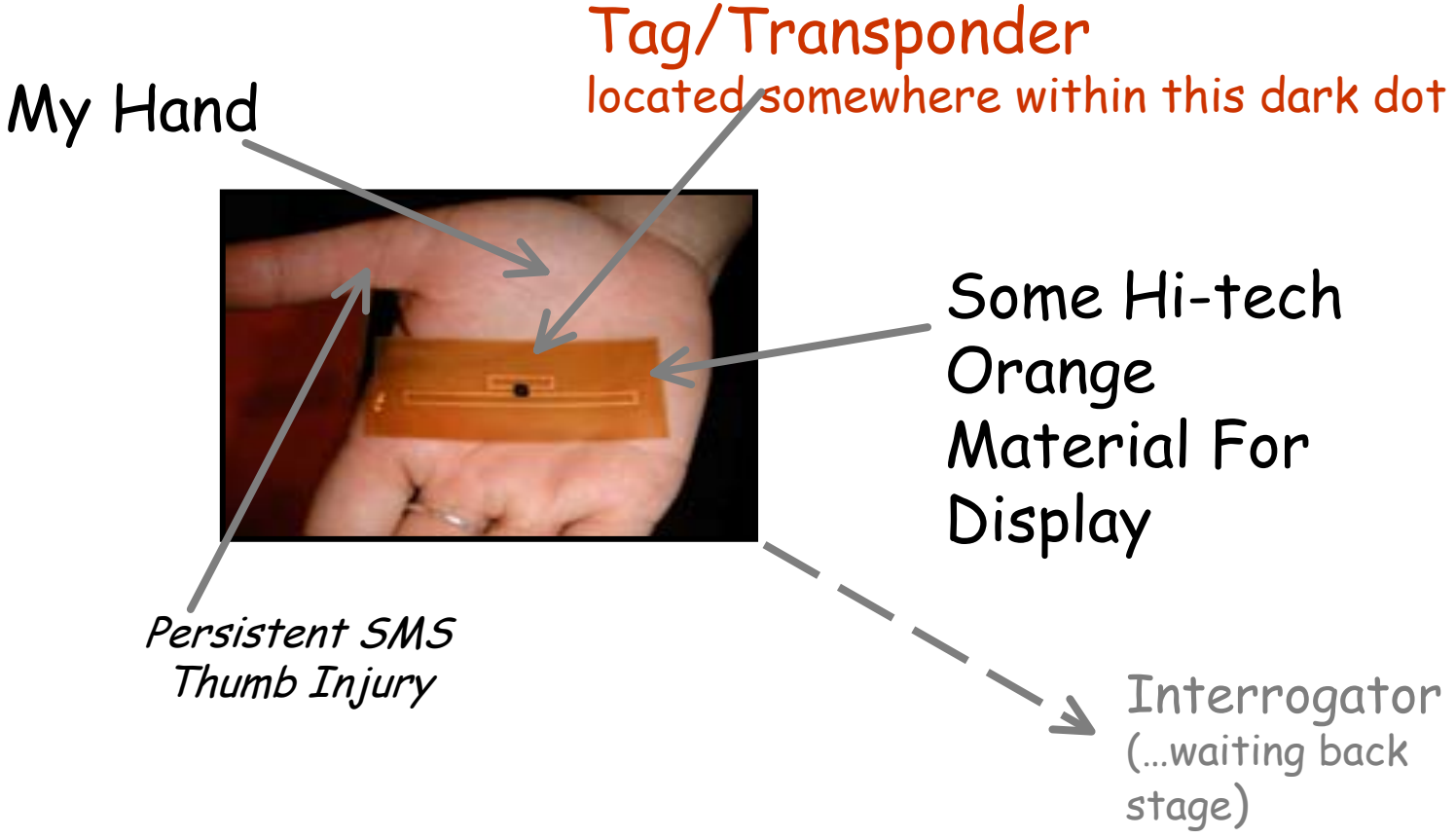
…enabling the “portable Internet”?

- often used at the edges of the network, e.g. as wire replacements
- takes the next step in “always-on” connections anywhere and anytime…
  - to anyone and “anything”
- enables a ‘ubiquitous communication environment’
- key growth area:
  - RFID



quick look at RFID as an 'enabler'

- not a new idea - all about radio after all (19thC)
- RFID system consist of : a tag (smaller than a grain of rice), a reader and middleware



fragmented standards

- RFID currently hindered by fragmented efforts towards standardization
  - With exception of development of standardization of identifiers/codes
- 2 main areas for RFID standardization
  - RFID frequency and protocols for communication of readers & tags/labels
  - Standardization of data formats placed on tags and labels
- Main international players include ISO, ETSI, EPCglobal…and ITU

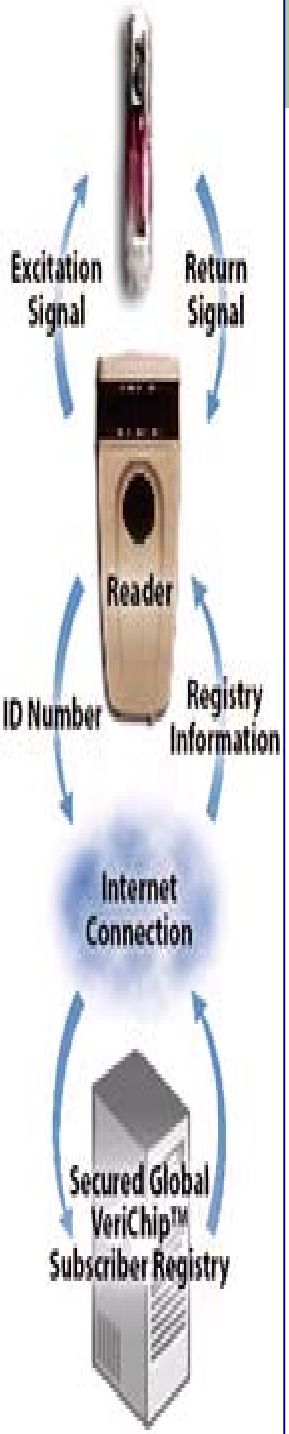
the uniqueness of RFID

- RFID transponders contain “unique” identifiers & are thus more than just the next generation of bar codes
- information contained on RFID tag can include: location, price, washing instructions, banking details, medical records etc…
- RFID already being used in transport, access control and supply-chain management.
- New developments include the use of RFID for retail shopping, contactless payment and personal identification

creating smart lifestyles

- RFID deployment in combination with sensor technologies to develop smart appliances, houses, and cities
- RFID environments for the physically challenged or elderly
- RFID tags & readers are getting smaller

Example: Smart Watch (U. of Washington/Intel)
Working prototype is an intelligent, integrated and responsible system, capable of prompting users who leave house or workplace without essential items, e.g .keys, wallet, which are tagged. When the watch passes a reader, information is sent to a personal server that checks whether all critical items are present.

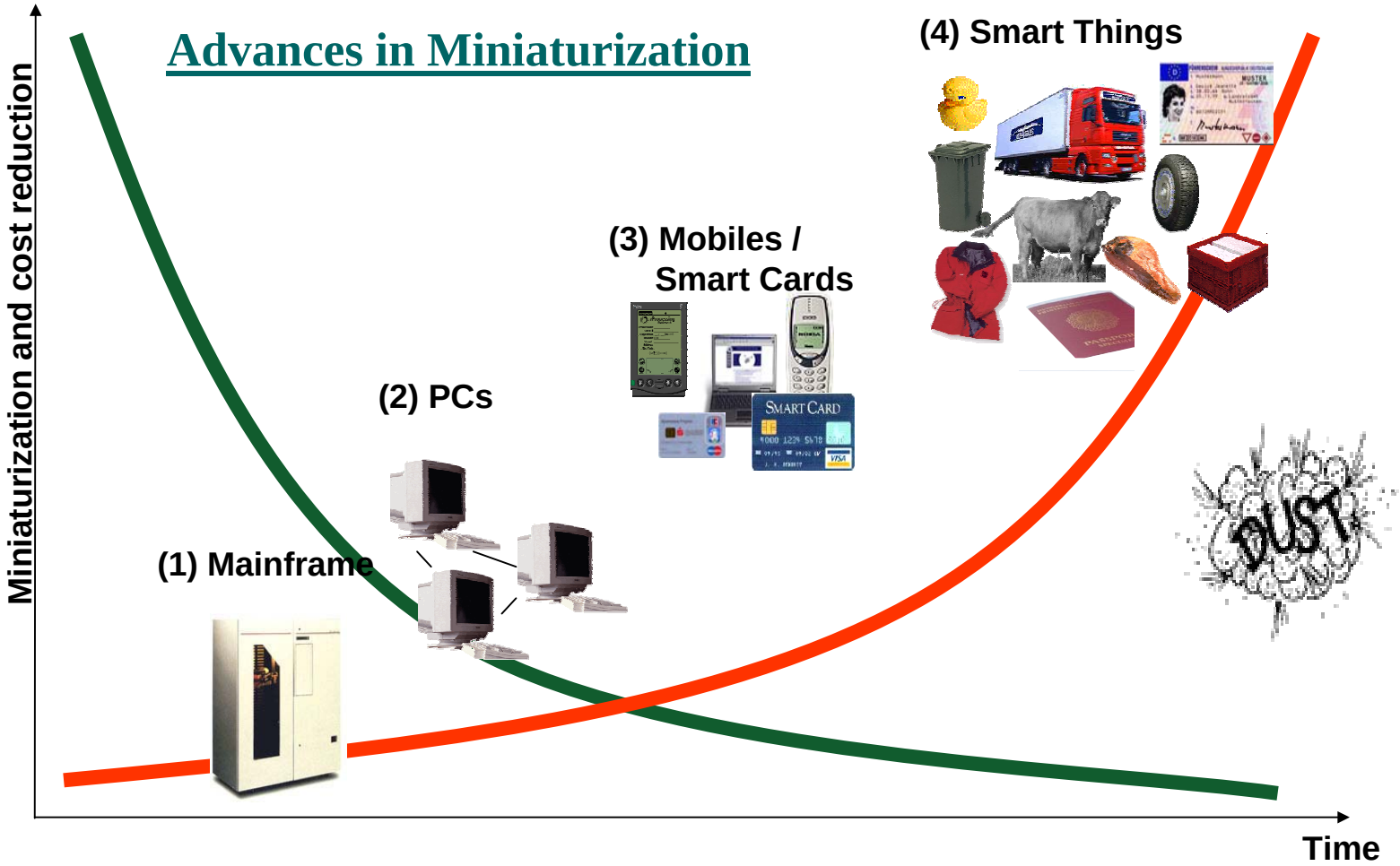


chipping humans?

- Verichip™ developed by Applied Digital Solutions is the size of a grain of rice
- Already being used today, e.g. by Baja Beach Club in Barcelona
  - VIP patrons can order drinks by simple wave of the hand
  - Access control to exclusive lounges

- Verichip™ Recently approved by US FDA (Food & Drug Administration), for now, for medical purposes

so we're on our way to a world of "smart things"....



Source: E. Fleisch, University of St. Gallen, Switzerland

though we will be & are certainly facing a number of challenges on our way:

- technical challenges
  - harmonization and standardization
  - efficient use of spectrum
- economic challenges
  - how to find those economies of scale
- public policy challenges
  - how to allocate spectrum, how to govern resources
  - how to protect data and limit harmful content
  - how to reach “true” ubiquity (‘the last billion’)
- social challenges
  - privacy protection (also a regulatory challenge)
  - impact on human behaviour and social interaction

…preparing for these challenges promises a future with endless possibility - imagine:

- you can’t lock your keys inside your house;
- you can keep an eye on an ageing relative’s health with your mobile phone;
- you don’t have to stand in line at the shop, as payment is automatic when you exit… or perhaps your intelligent fridge has already pre-ordered for you;
- your mobile can scan any medication at the pharmacy, or foods in the supermarket, in order to avoid contra-indications or allergies;
- your smart car tells you when the movie is on, how to get there, allows you to buy tickets, and each one of your tires is networked, with its own ‘home page’ ;
- your jacket adjusts to the temperature outside before it starts to rain or before the heat gets to you!

“ to chop a tree, spend twice the time sharpening the axe”

- Chinese proverb

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t h a n k s !

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