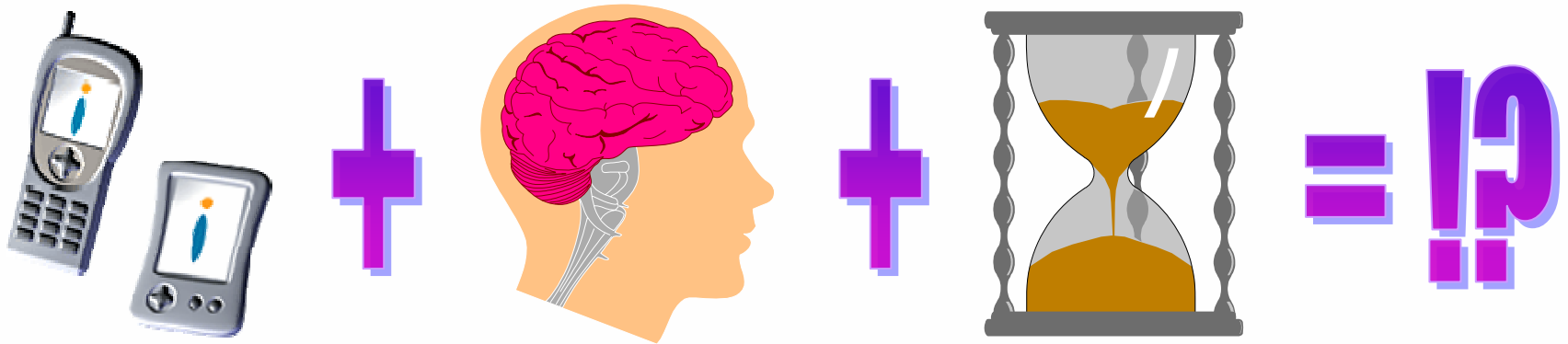# The mind-boggling future of the mobile phone

Learning from an example of accelerated technology?

David Wood, Co-Founder & EVP Research, **symbian**

Personal context: Three brains

- My biological brain

    … 47 years of data

    … In need of a very serious de-frag (and lots more besides)

- My Psion Series 5mx PDA

    … 18 years of data

    … Closest to my heart

> Before long, most people will have two active brains

- My smartphone (Nokia, Sony Ericsson, Samsung, or Motorola...)

    … Communications, community, content, commerce – and convenience

    … Mobile window to the digital world (Google, Wikipedia, BBC, EBay…)

- Forgetting my Compaq Evo nc4010 laptop

    … Love-hate relation

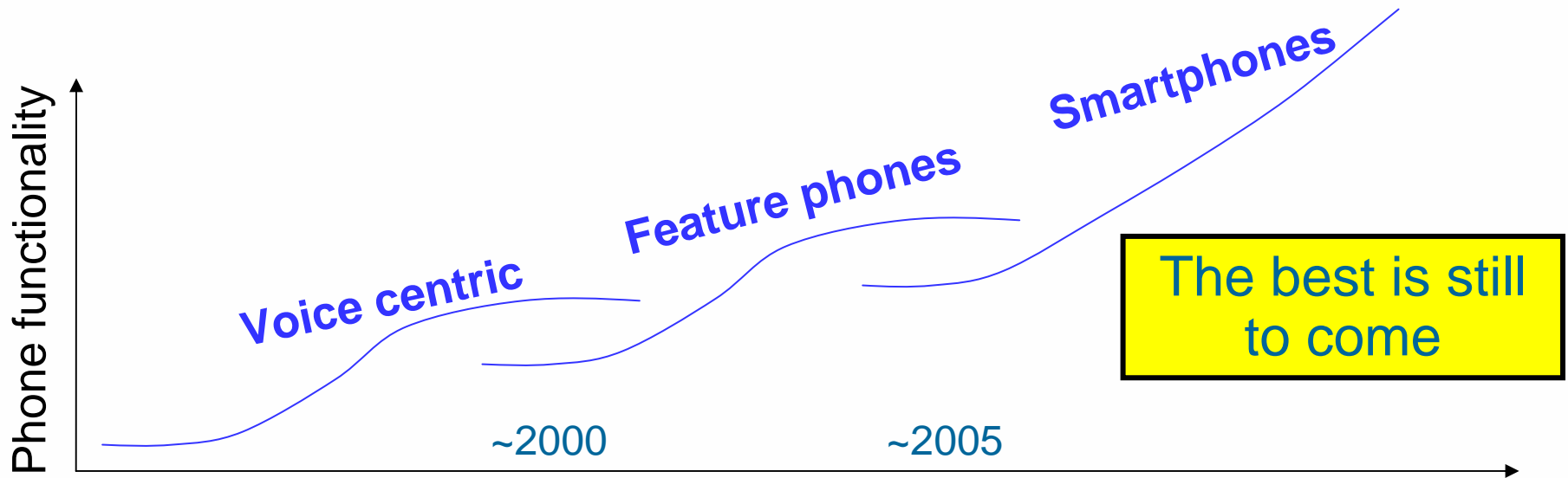   … In some ways the most powerful, in many ways the least immediate

Two possible learnings from the rapid progress of mobile phones

1. To what extent can improvements
   in mobile phones
   make humans smarter, wiser, kinder, better?

2. To what extent can aspects
   of the rapid improvements in mobile phones
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   in <u>other</u> areas of
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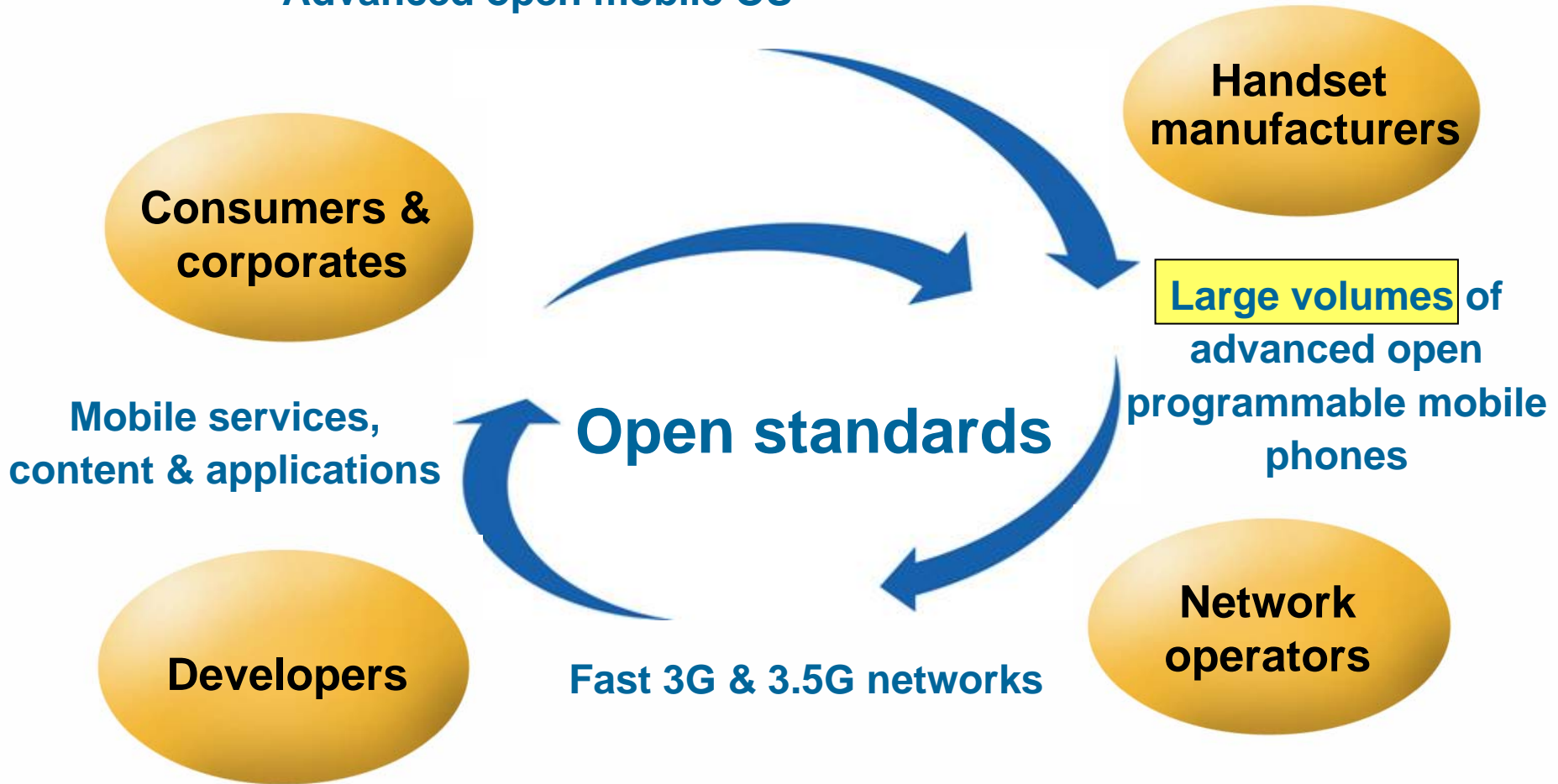
Three waves of mobile phones

Phone functionality

Voice centric

Feature phones

Smartphones

~2000

~2005

The best is still to come

Great communications	Graphics display	Rich programmability
Voice (& text)	Colour	Virtuous cycle
Pocketability	Camera	Innovation
Size	Audio: Ringtones+	Applications & services
Weight	Video	*Personal productivity*
Battery life	Memory	*Business productivity*
Robustness	Information	Mobile commerce
Reliability	Personalisation	Customisability

The smartphone market open virtuous cycle

Advanced open mobile OS

Handset manufacturers

Consumers & corporates

Large volumes of advanced open programmable mobile phones

Open standards

Mobile services, content & applications

Developers
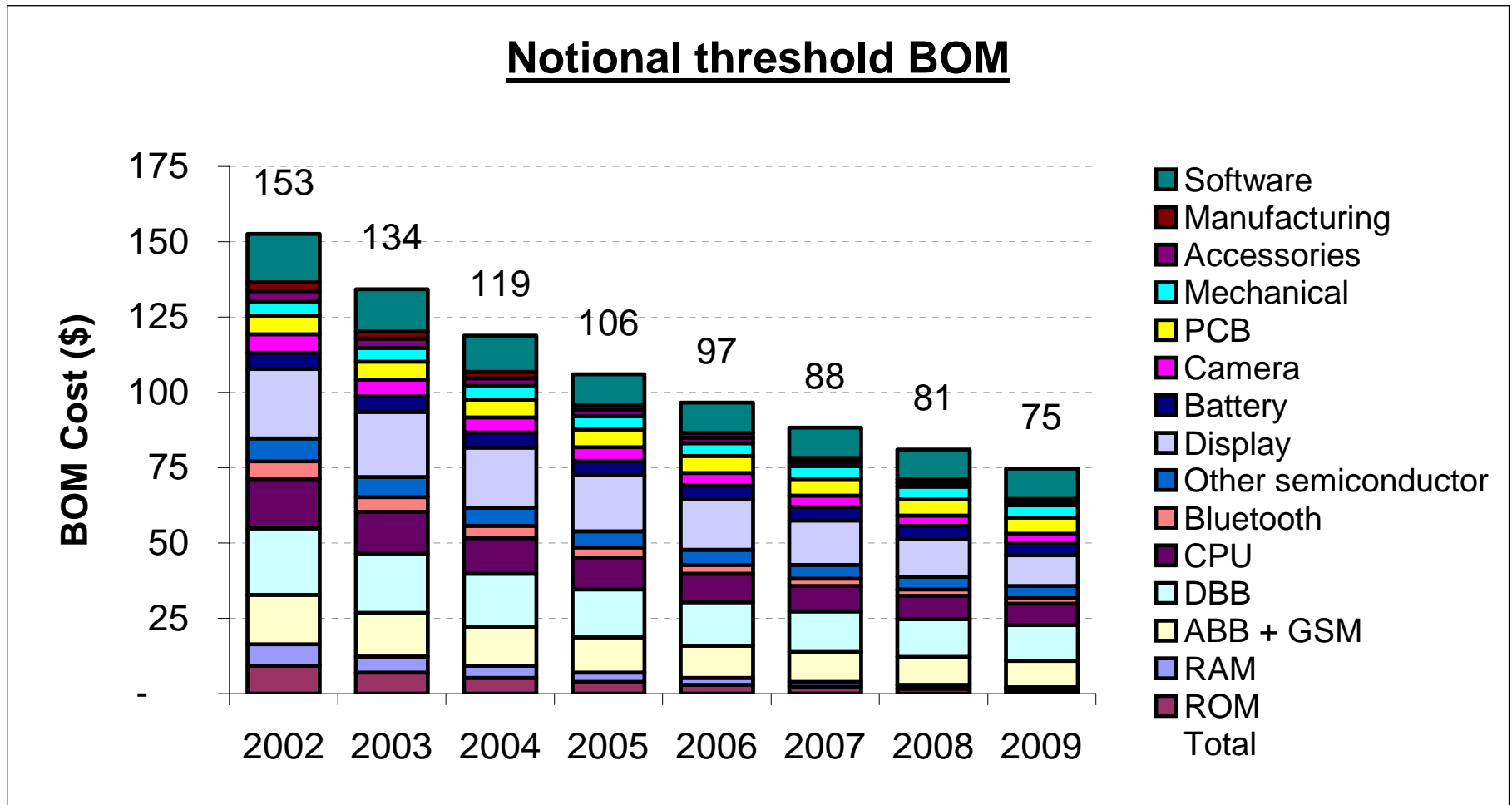
Fast 3G & 3.5G networks

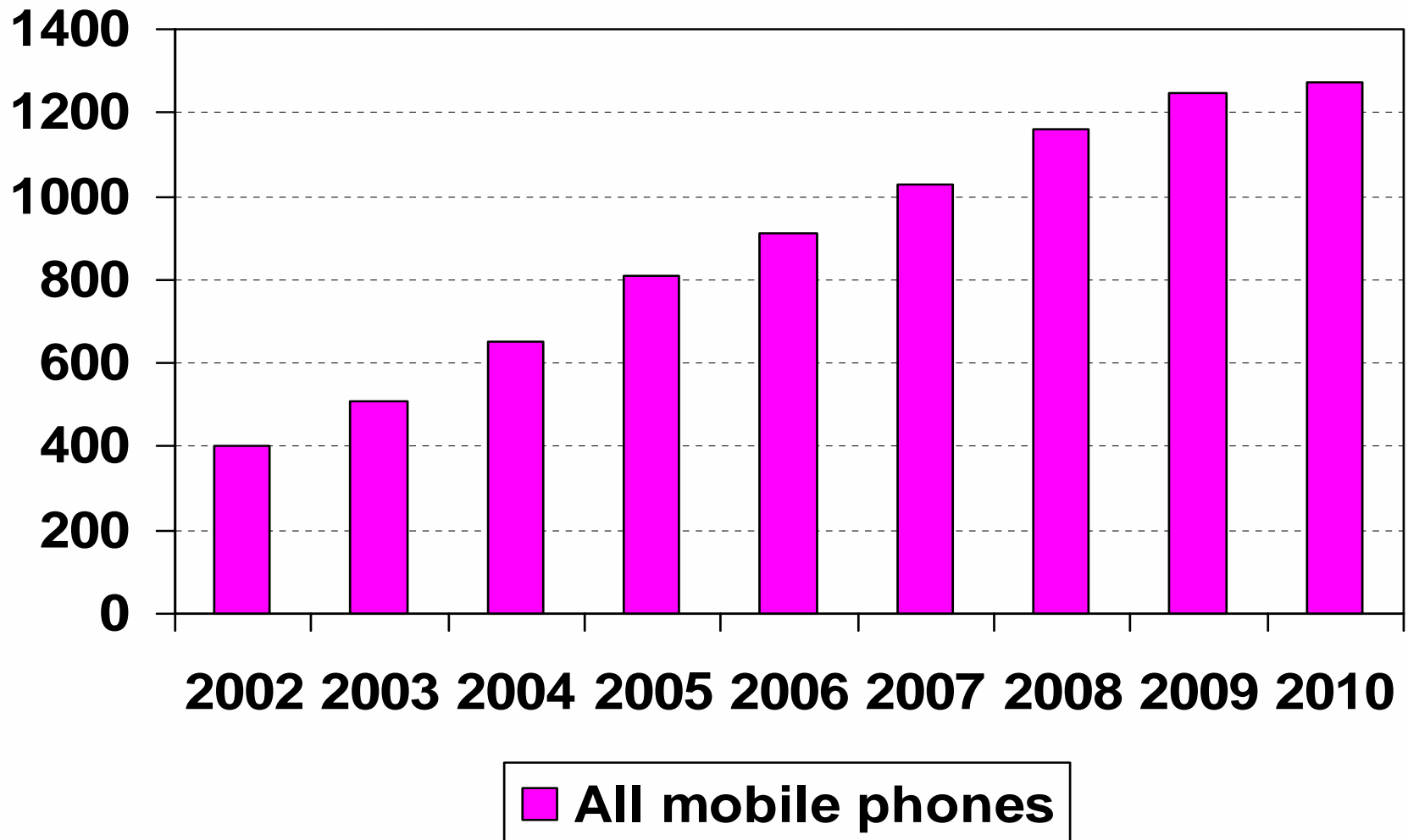**Network operators**

Driving costs down and volumes up

- Need to drive down costs:

    … Device build costs, and service deployment costs, and usage costs

- Costs are reduced, in part, by the working of Moore's Law

    … More computing power in a smartphone than put a man on the Moon?

- Moore's Law is driven by ingenuity in real companies

    … Eg ARM   **ARM** THE ARCHITECTURE FOR THE DIGITAL WORLD

- An even bigger effect is

    … Economies of Scale, and *the Learning Effect*, and the Free Market

- "Practice makes perfect"

    … Companies will practice very hard, if the potential rewards are very high

Smartphone Bill Of Materials cost decline

Notional threshold BOM

BOM Cost ($) vs Year

- 2002: 153
- 2003: 134
- 2004: 119
- 2005: 106
- 2006: 97
- 2007: 88
- 2008: 81
- 2009: 75

Legend:
- Software
- Manufacturing
- Accessories
- Mechanical
- PCB
- Camera
- Battery
- Display
- Other semiconductor
- Bluetooth
- CPU
- DBB
- ABB + GSM
- RAM
- ROM
- Total

Mobile phone market: sales per annum (M)

2002 2003 2004 2005 2006 2007 2008 2009 2010

□ **All mobile phones**

Smartphone _addressable_ market per annum (M)

But just because something's technically possible, it doesn't mean it will happen!

Chart values (addressable market, M):

Year	Smartphones	Other phones (total)
2002	~25	~400
2003	~55	~510
2004	~90	~650
2005	~145	~810
2006	~220	~910
2007	~305	~1030
2008	~375	~1160
2009	~495	~1250
2010	~620	~1270

Legend: ■ Smartphones ■ Other phones
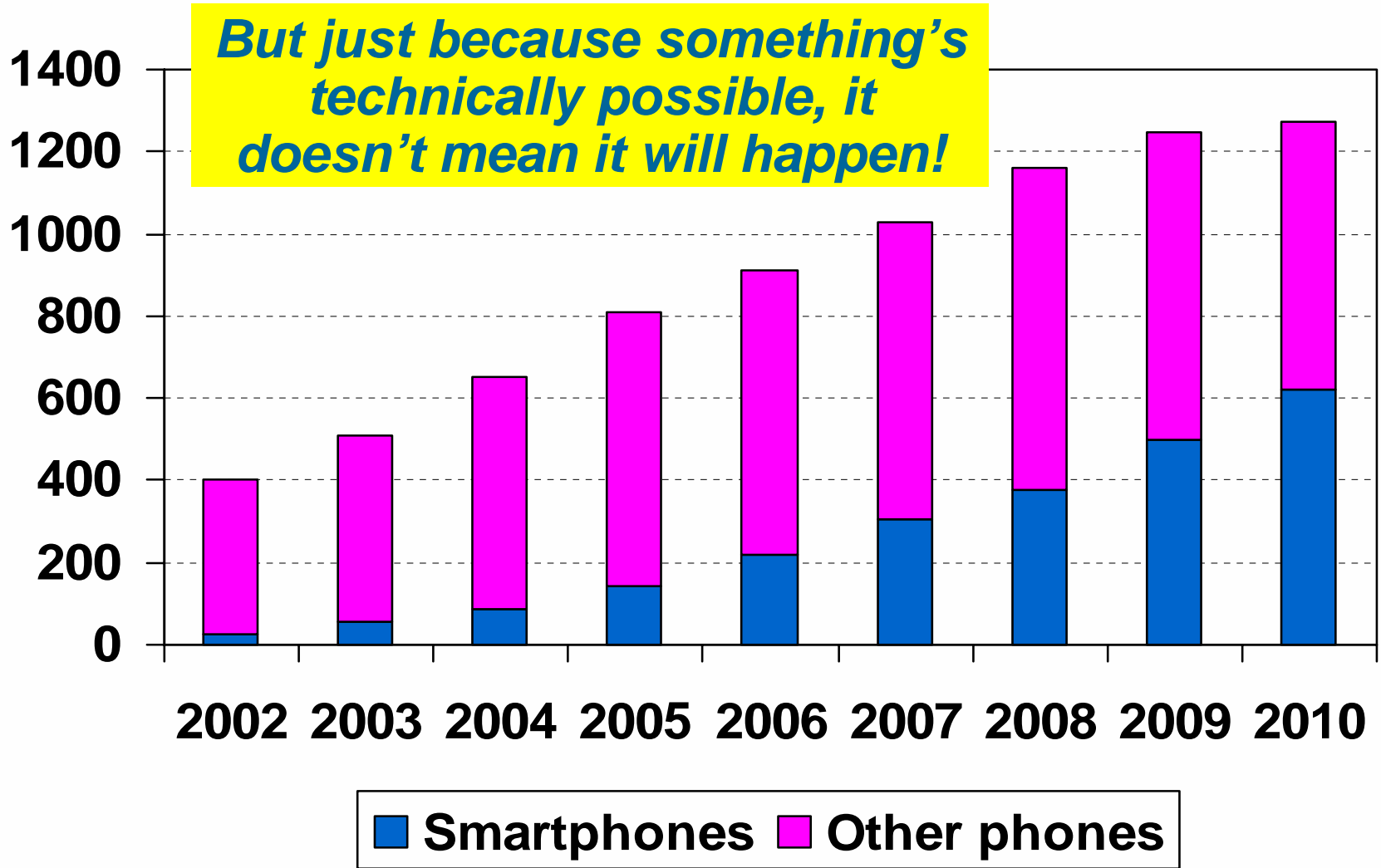
Technology adoption life-cycle

Can accept poor usability

Won't accept poor usability

THE CHASM

Innovators, technology enthusiasts

Early adopters, visionaries

Early majority

Late majority

Laggards, sceptics

Bowling pin solutions

Customers want technology and features

Customers want complete solutions, reliability, and convenience
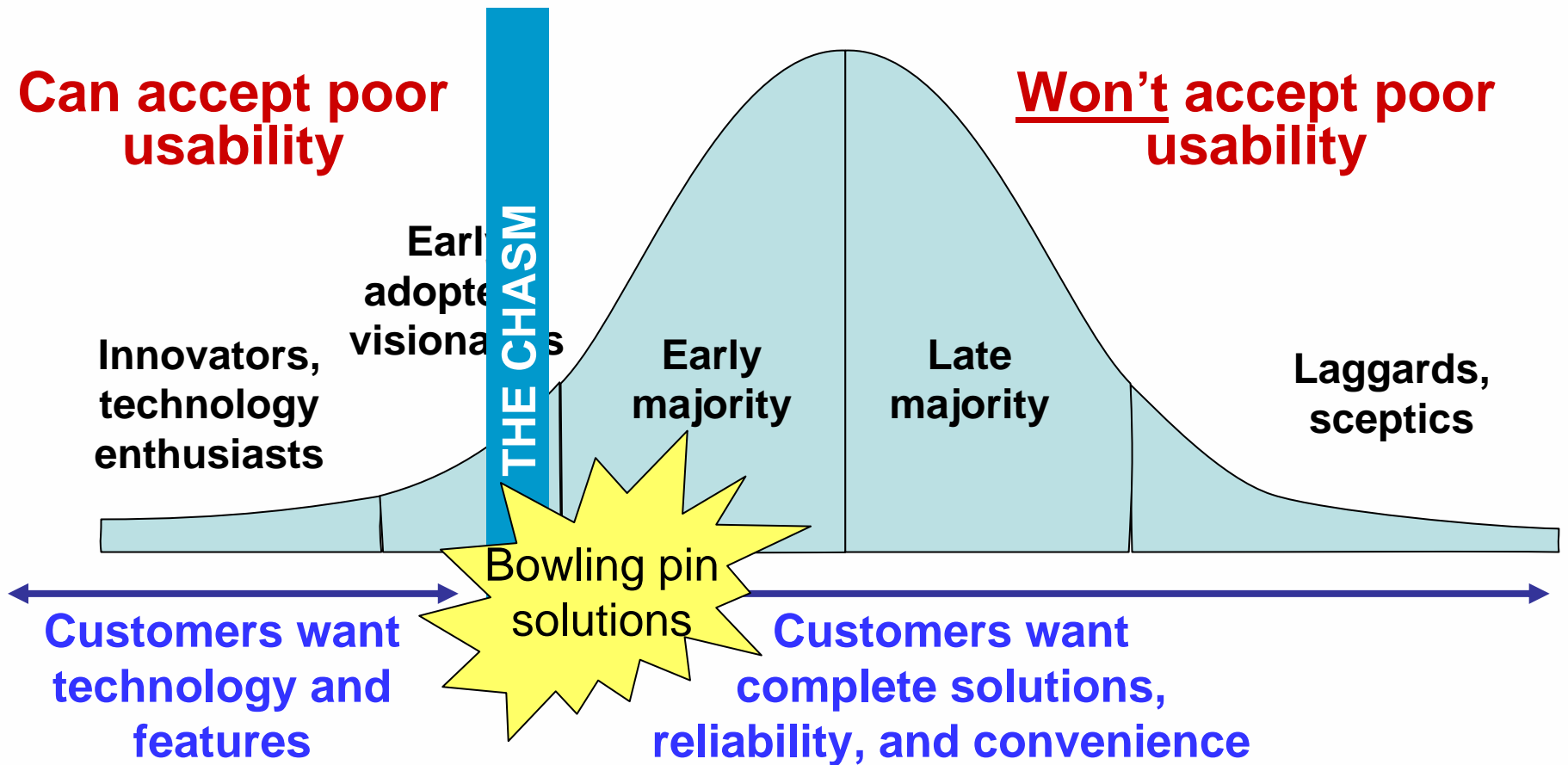
(source: Geoffrey Moore – "Crossing the Chasm")

Smartphones are crossing the chasm because:

- They allow users to build on & do more of the things that caused users to buy phones in the first place

  - …**Communication** (and messaging)

  - …**Safety & connection** (timely info in context)

  - …**Fashion & fun** (personalisation)

- AND they allow users to do these things **simply**

  - …(Even though the phones themselves are increasingly complex)

- AND on that basis, provide additional functionality of genuine value to users

  - …**For example, becoming people's preferred personal mobile gateway into the digital universe…**
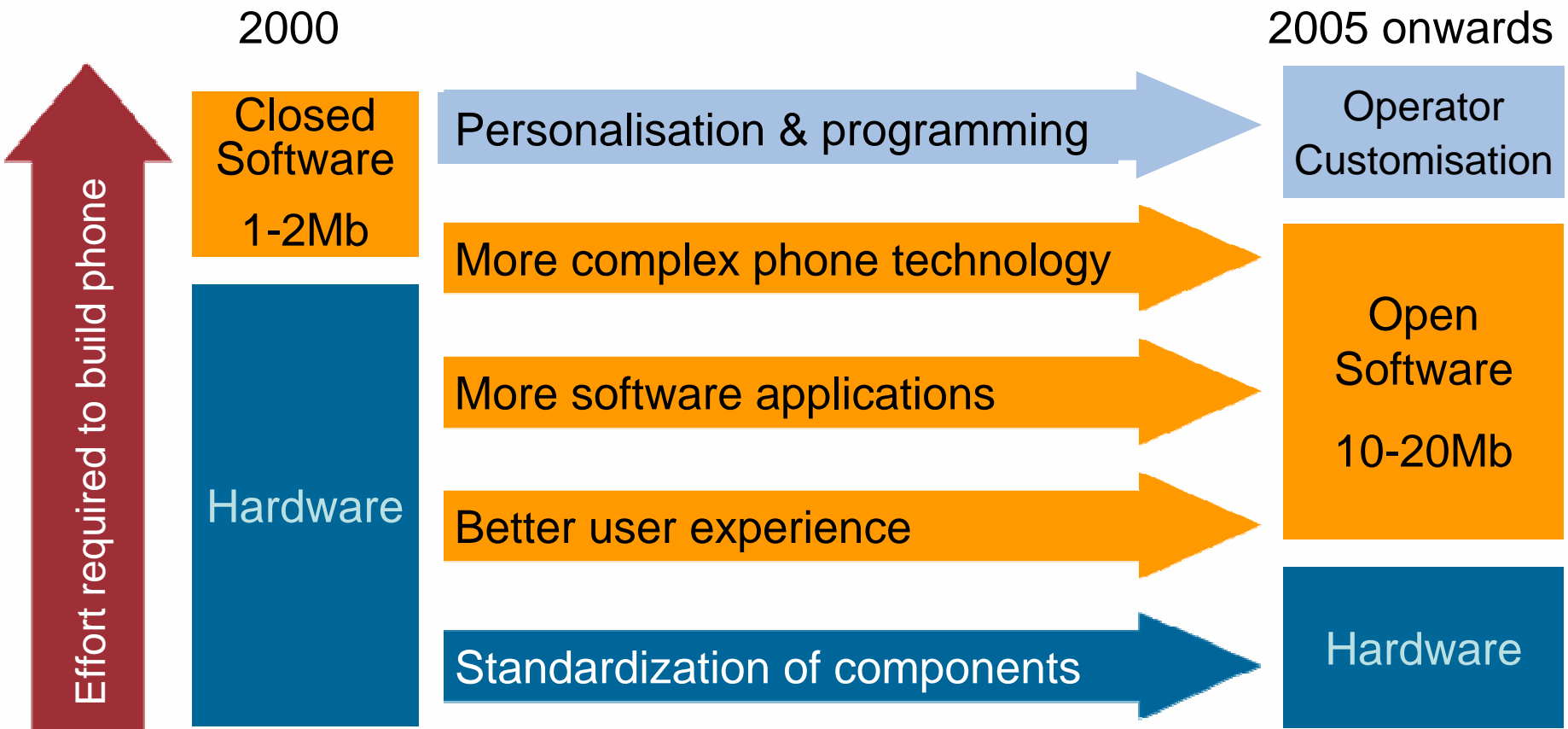
Mobile gateway into the digital universe

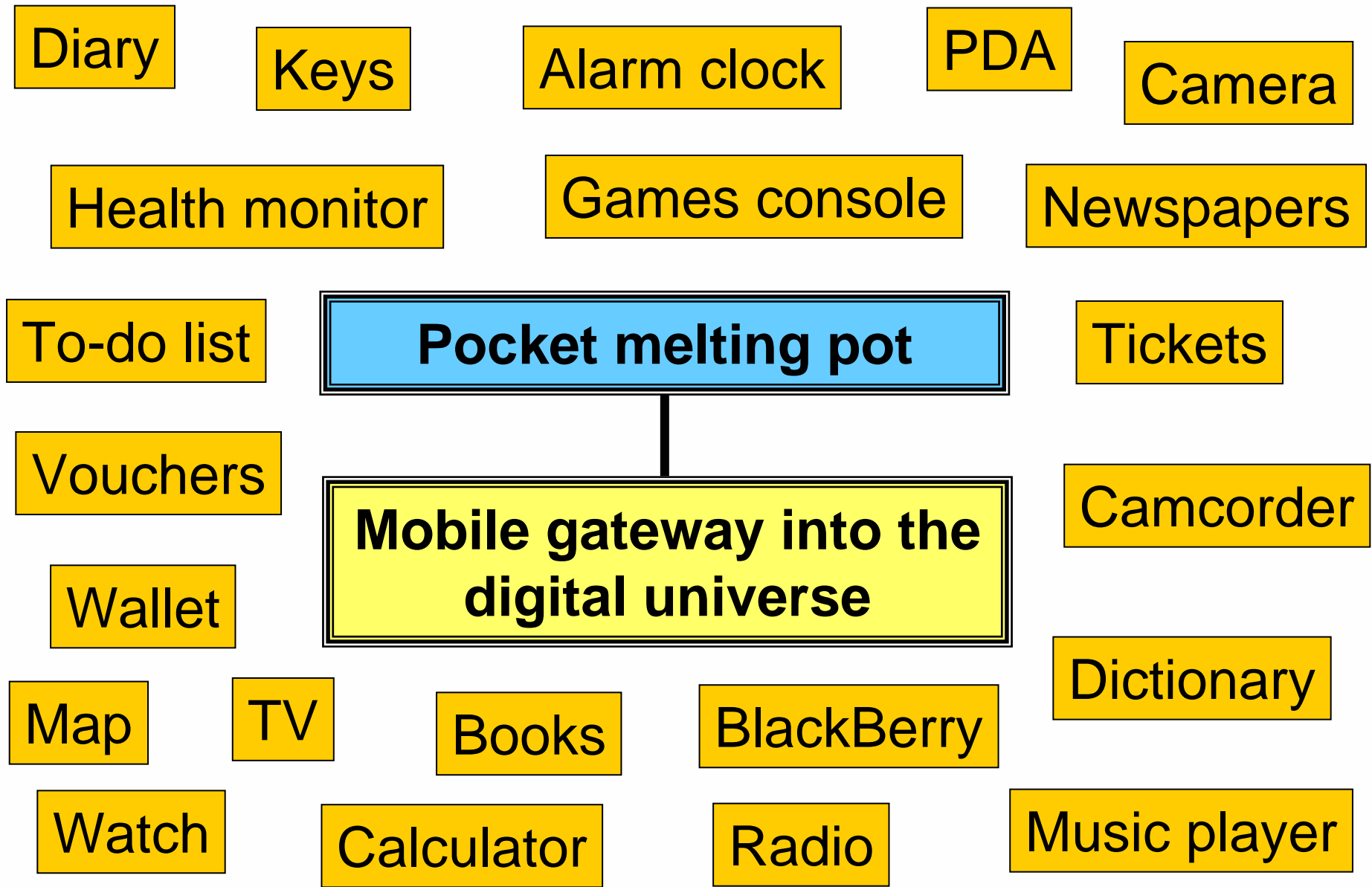TransVision 2006: *Emerging Technologies of Human Enhancement*

Accessing the digital world, while mobile

- Improved bandwidth – faster networks

- Improved screens

  - … Number of pixels, Resolution, Colour depth, Sharpness

- Improved input

  - … Handwriting recognition, Intelligent word completion
  - … Bluetooth keyboards, Gestures, Voice recognition, Brainwaves…

- Intelligent software!

  - … Proxies, Layout engines, optimised transmission…
  - … Intelligent sentence completion and comprehension…

The increasing value of software

2000

2005 onwards

Effort required to build phone

| Closed Software 1-2Mb |
| Hardware |

Personalisation & programming

More complex phone technology

More software applications

Better user experience

Standardization of components

Operator Customisation

Open Software 10-20Mb

Hardware

Diary

Keys

Alarm clock

PDA

Camera

Health monitor

Games console

Newspapers

To-do list

Pocket melting pot

Tickets

Vouchers

Mobile gateway into the digital universe

Camcorder

Wallet

Dictionary

Map

TV

Books

BlackBerry

Watch

Calculator

Radio

Music player

Mind-transforming effects of smartphones

Users cope – younger users take them in their stride

Smarter users

- Better memory

- More in touch with key information

- More in touch with key people

- Better organised and more productive

- Better mentored

- More choice

- Smartphones will increasingly become smarter than their human users
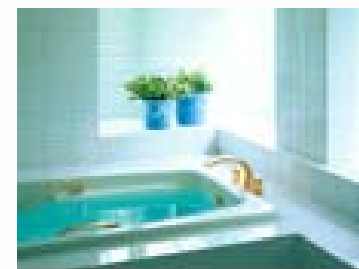
Smart Phones = Smart Lives

More achieved
More leisure
More pleasure…

New waterproof Japanese phone

- Sony Ericsson shipped the SO902iWP – a completely waterproof phone

- Commercially available on June 30

- Can be used in the bathroom, seaside and even under water

バスルームで

海辺で

For more information about smartphones

- *Smart mobs: the next social revolution*

  … by Howard Rheingold

- *Communities Dominate Brands, 3G Marketing, M-Profits,* and *Services for UMTS* [4 books]

  … by Tomi Ahonen

- www.Symbian.com   **symbian**

- The Symbian Smartphone Show

  … 17-18 OCTOBER 2006, EXCEL, LONDON

  … **120 exhibiting companies**

  … **60 free seminars**

  … **3000+ attendees** from the entire smartphone industry

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Two kinds of driver for progress

Commercial drivers for smartphone progress

- Smell of money!   *The smell of **feasible** money!*
    - … "The business of business is business"
- The mobile phone industry's version of TV06?
- 3GSM: Barcelona – Enormous hustle and bustle
    - … 50,913 attendees (up from 33,793 last year), 2085 media people
    - … Up to 20 seminar tracks and presentations happening in parallel
- Technical feasibility is not enough to guarantee progress
- The technology has to satisfy a strong **human need…**
- At a sufficiently **attractive price** to individual end users
- Where the product has sufficiently **usability**
    - … Not requiring prolonged learning or disruptive changes in lifestyle
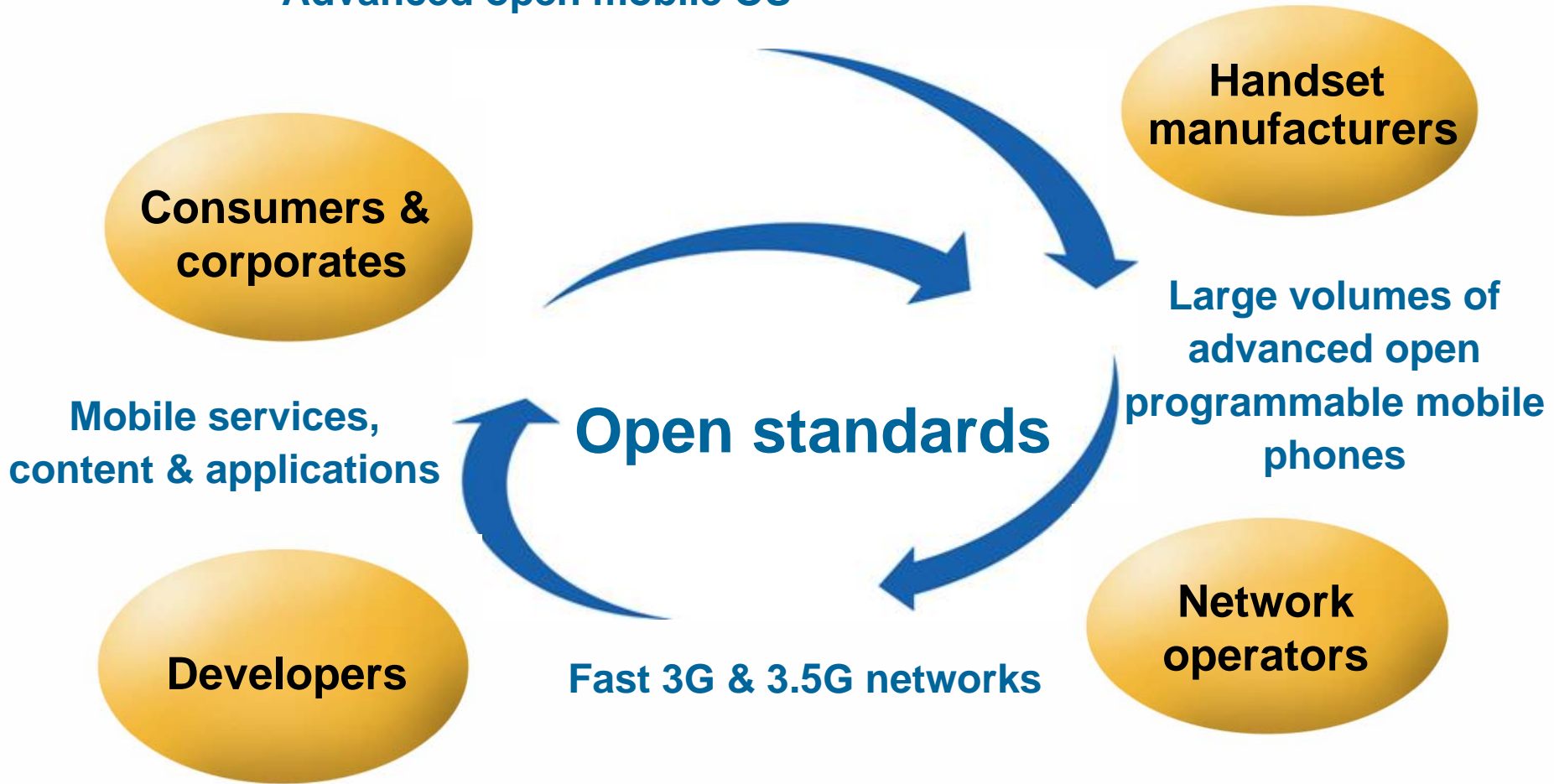- ***But even this is not sufficient…***

Open virtuous cycle

- "Evolution, not creation"
    - … The eventual version of massively innovative technology is almost always attained through a series of incremental steps
    - … Where each individual steps adds some extra value
    - … *And makes commercial sense in its own right*
- Credible roadmap
- Help in dealing with bottlenecks
    - … The system must encourage and enable sufficient amounts of **fresh new thinking** to be brought to bear on the central problems
- So, the development process must be **Open**
    - … To accept new ideas
- And **Continuously commercially attractive**
    - … To encourage companies to *come up with new ideas* AND to continue *to search for ways to successfully execute their ideas*
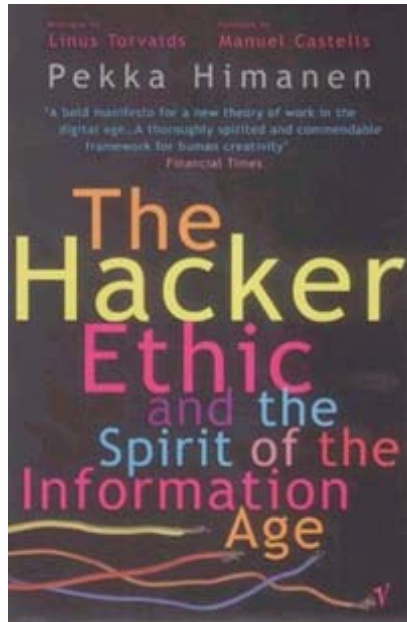
The smartphone market open virtuous cycle

Hugely simplified!

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Beyond commercial drivers

- The Hacker Ethic and the Spirit of the Information Age

  … Pekka Himanen & Linus Torvalds

- Compare with "The Protestant Ethic and the Spirit of Capitalism"

  … Max Weber

- Rich intelligence at the edges

- Not dominated by central companies

- Beyond thin partnership

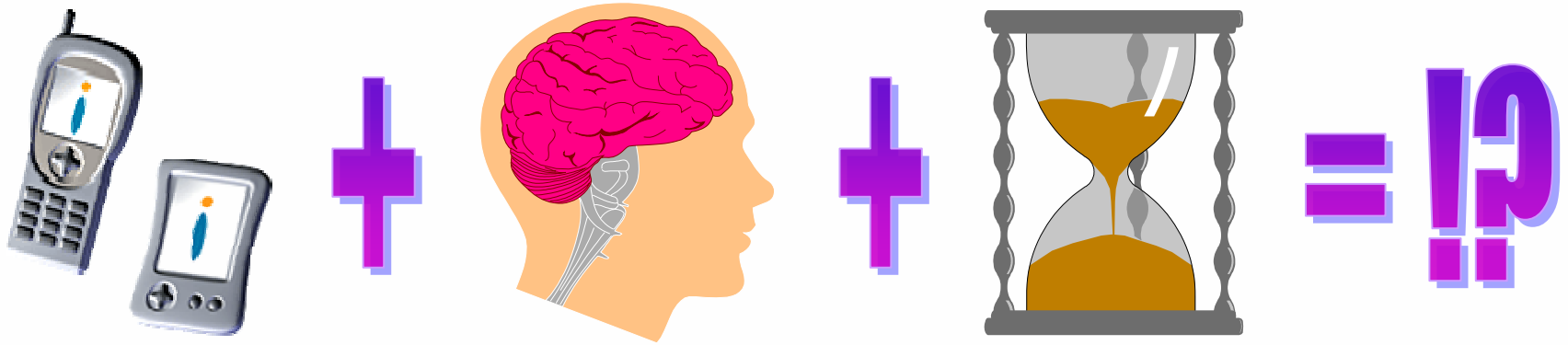- Wider investment of passion and creativity

Classical work ethic vs "hacker ethic"

• Money	• Passion
• Work	• Freedom
• Optimality	• Social worth
• Flexibility	• Openness
• Stability	• Activity
• Determinacy	• Caring
• Result accountability	• Creativity

+ Emerging technology

+ Open markets, open virtuous cycle, open minds

+ Collaborative approach

+ Heart as well as brain

The best is still to come