Part of one diagram in US Patent 3,906,166

Class 3 – April 2 2009

HUMAN CENTRIC MOBILE COMPUTING 2009

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1

HUMAN CENTRIC MOBILE COMPUTING 2009

Exercise 1
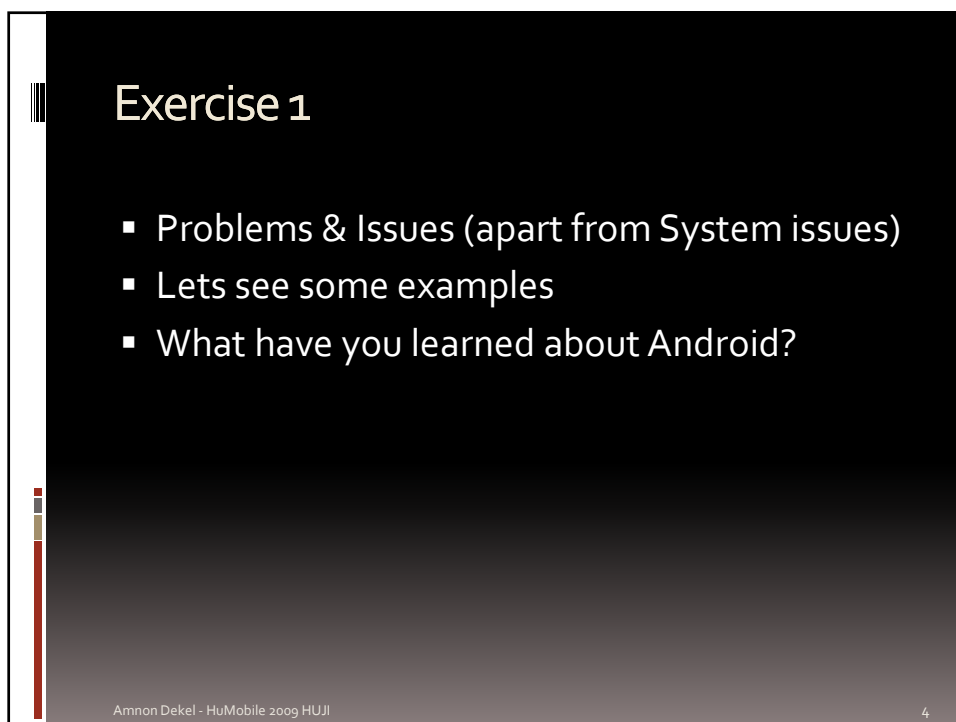
The Mobile Market + teaser

Home Exercise 2

Lab Excercise

2

EXERCISE 1

Exercise 1

- Problems & Issues (apart from System issues)
- Lets see some examples
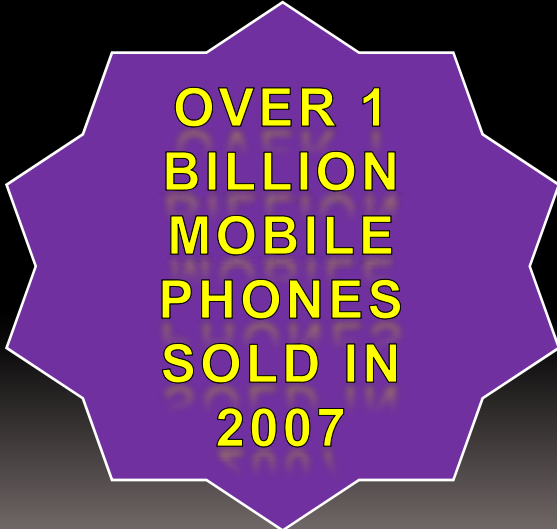- What have you learned about Android?

THE MOBILE MARKET + TEASER

5

Teaser

- Did you know?

6

The Mobile Market

OVER 1 BILLION MOBILE PHONES SOLD IN 2007

7

The Mobile Market

$1 Trillion Market in 2008 !

8

The Mobile Market

$1 Trillion 2008 !

In only 20 years!

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9

The Mobile Market

2008

50 percent mobile penetration point crossed!

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10

Worldwide Mobile Market 2007 in brief

✦ WW subscribers base : **3,4 bn** all techno (+24%)

✦ WW SIM deliveries: **2,6bn (+29%)**, est. 2008: 2,9 Bn (+13%)

✦ Mobile handsets shipments: **1,2 bn** (+12% vs 2006) and 1,3 bn are expected for 2008 (+8%).

✦ 68% of subscribers are prepaid

✦ WW penetration rate has reached for the 1st time 50%

✦ GSM remains by far the dominant technology, but W-CDMA shows strong growth
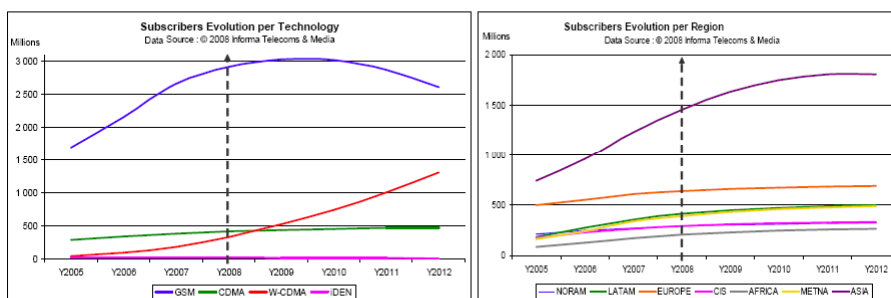
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2007 in advanced markets : the user experience was dramatically improved

Key mobile trends 2007

✦ Mobile broadband finally became a reality: deployed in 90% of Advanced markets (HSDPA, EVDO)

✦ Data ARPU grew but just compensated decline in Voice ARPU

✦ Convergence-based business models accelerated M&A

✦ … the star product wins thanks to a superior man-machine interface

✦ Internet players full speed to invade the Mobile internet space: Yahoo Go! 3.0, Google Android… content from many sources, direct route to the consumer.

✦ Handset vendors announce the launch of major service portals

4 million iPhones sold in 200 days!

Key mobile trends 2008

✦ Year 1 of the Mobile Internet equipment and usage: broadband, content, IM, search, VoIP…

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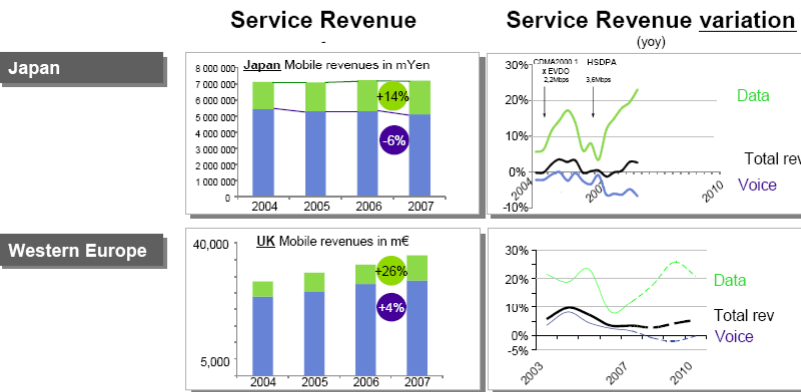
Time to build new revenue streams

✦ In mature markets, Telcos need new revenues to compensate declining voice

■ Data
■ Voice

Service Revenue

Service Revenue variation
(yoy)

Japan

Japan Mobile revenues in mYen

+14%
-6%

2004 2005 2006 2007

CDMA2000 1 HSDPA
x EVDO 2,2Mbps 3,6Mbps

Data
Total rev
Voice

2004 2010

Western Europe

UK Mobile revenues in m€

40,000

+26%
+4%

5,000

2004 2005 2006 2007

Data
Total rev
Voice

2003 2007 2010

Sources: MNOs, Informa, Gartner

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2007 in advanced markets

Smart phones reach critical mass

Global shipments H1 2007 (mu)

Smartphone	48
Laptops	46
iPod	
PSP	

0   20m   40m

Since 2006, there are more smart phones than laptops shipped globally.

A new computing cycle, with new usages

Speed arrives on the mobile phone

% of population covered with
HSDPA in Western Europe

95%
50%
35%
2%

0 0 0 0 0 1
5 6 7 8 9 0

technos
Not yet launched
W-CDMA
HSDPA+W-CDMA

Source: 3G Americas, GSA, Defferon Lierre (9, 2007)

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GSMA working groups
Telcos line up to avoid being excluded from the Mobile Internet value chain

Mobile Internet

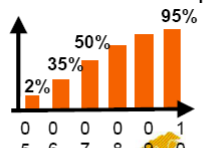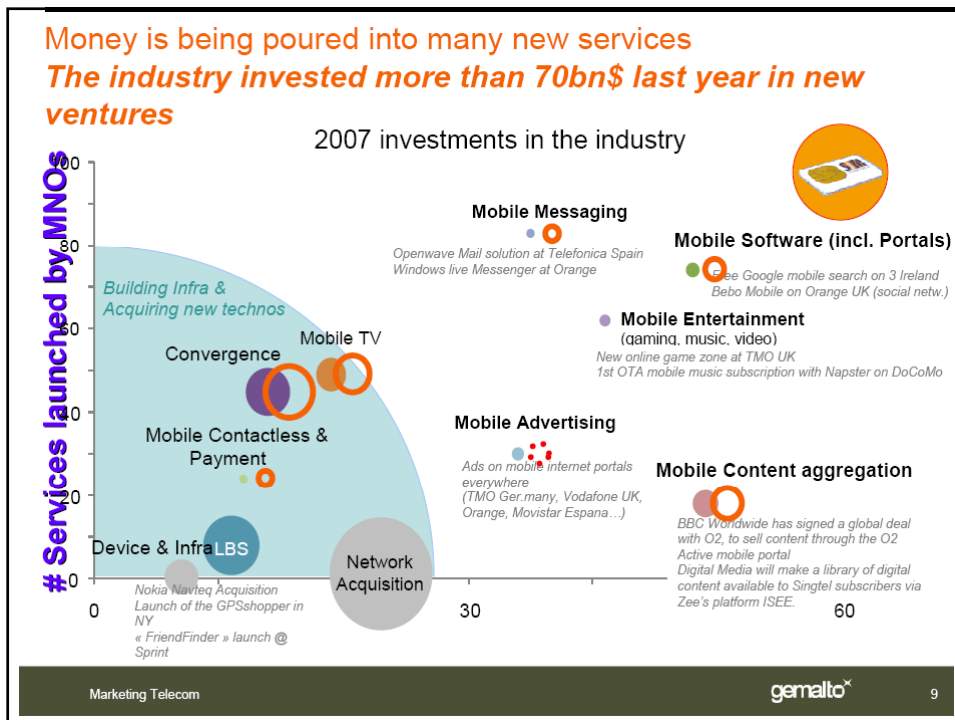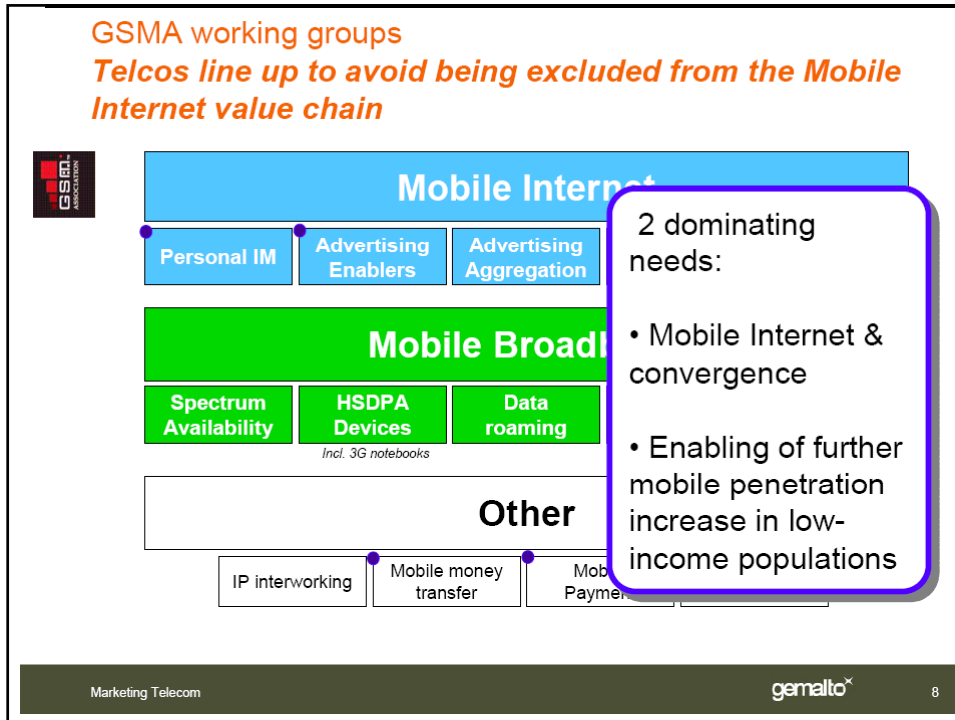| Personal IM	Advertising Enablers	Advertising Aggregation

Mobile Broadl

Spectrum Availability	HSDPA Devices	Data roaming

Incl. 3G notebooks

Other

IP interworking	Mobile money transfer	Mob Paymer

2 dominating needs:

• Mobile Internet & convergence

• Enabling of further mobile penetration increase in low-income populations

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Money is being poured into many new services
The industry invested more than 70bn$ last year in new ventures

2007 investments in the industry

 # Services launched by MNOs

Building Infra & Acquiring new technos

Mobile Messaging
Openwave Mail solution at Telefonica Spain
Windows live Messenger at Orange

Mobile Software (incl. Portals)
See Google mobile search on 3 Ireland
Bebo Mobile on Orange UK (social netw.)

Convergence

Mobile TV

Mobile Entertainment
(gaming, music, video)
New online game zone at TMO UK
1st OTA mobile music subscription with Napster on DoCoMo

Mobile Contactless & Payment

Mobile Advertising
Ads on mobile internet portals everywhere
(TMO Ger.many, Vodafone UK, Orange, Movistar Espana…)

Mobile Content aggregation
BBC Worldwide has signed a global deal with O2, to sell content through the O2 Active mobile portal
Digital Media will make a library of digital content available to Singtel subscribers via Zee's platform ISEE.

Device & Infra LBS

Network Acquisition

Nokia Navteq Acquisition
Launch of the GPSshopper in NY
« FriendFinder » launch @ Sprint

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9

Overview of the Telecom ecosystem – focus on advanced markets
Key mobile trends

Services : Multimedia confirmed as the #1 priority for MNOs, and now speed is deployed
+ Content & Communication (Web 2.0) are the growth engine of the digital eco-system
+ MNOs have strong objectives to grow data revenues (up to 30%) … and will need to start Mobile Advertising in 2008-09 to reach target
    + MNOs have strong pressure on cost reduction, as ARPU growth is below target
+ Internet players full speed to invade the Mobile internet space: Yahoo Go! 3.0, Google Android… content from many sources, direct route to the consumer…

Handsets : The star product wins thanks to a superior man-machine interface
+ Handset market is consolidating (top 5 players are now representing 83% of the market)
+ Introduction of open OS (Windows, Symbian, Linux are now chosen as reference platform.) Open OS will account for more than 50% of handset shipped in 2010
+ Google enters in mobile OS market with Android, Apple enters mobile with iPhone + iTunes, MMI is a key success factor
+ Handsets manufacturers also service: Nokia Ovi, Apple revenue sharing model for the iPhone

Technology / Networks : Mobile broadband finally made reality, deployed in 90% of advanced markets (HSPA, EVDO)
+ Convergence is changing the picture, strong & common authentication is now needed to bridge the gap between the two worlds
+ Wi-fi & WiMAX are gaining momentum, LTE is near
+ Contactless payment and transport on mobile are emerging in certain markets
+ Management of identity will become more and more important

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Overview of the Telecom ecosystem – focus on advanced markets
Impacts for Mobile Operators

Convergence

+ Bridge the gap between fix/mobile world to extend services
+ Develop content / services across all networks (mobile TV with broadcasters, contactless with transport/payment players)

Services & Branding

+ Establish / reinforce brands
+ Improve & secure access to services
+ Develop personalized & ubiquitous services
+ Extend brand/services beyond mobile (to PC/internet world)

New business challenges

+ Generate additional revenues with advertising
+ Differentiate from competition & internet newcomers establishing one to one relationship with end-users
+ Reduce cost / optimise investments

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Innovation Strategy
… to propose a wide range of services

Secure Identity across networks

Foster access to services

Support new business models

MOBILE CONTACTLESS solutions

MULTIMEDIA solutions

MOBILE MARKETING solutions

MOBILE TV solutions

Develop personalized &

mPayment / mBanking solutions

competition & internet

all networks (mobile TV with broadcasters, contactless

beyond mobile

INTERMEDIATION / OPERATED solutions

CONVERGENCE solutions

investments

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13

HOME EXERCISE 2

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20

Suduko Game

1. Sudoku Game:
   - Using the chapter xerox hand out- do the Sudoku project in it
   - Extra points:
     - Add on online best scores listing for your game
   - Even more points:
     - Add a *universal* online score listing that ALL games can interface with
   - Hand In: By Class 4, April 23
2. Start thinking and Project Ideas
   - Send me email with up to 3 ideas you like

21

Lectures

- Only one group has spoken with me yet
- Lecture:
  - ~20-30 minutes
  - At least 10 minutes per person

22

LAB EXCERCISE

Start the Sudoku Game

- Go to the lab
- Make sure Linux installation is OK
- Start working on Sudoku

Course Web Site

- www.cs.huji.ac.il/~amnoid/humobile/

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25