Mobile User Interface

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Good ot Bad?

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Simplify, Simplify, Simplify!

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Outline

- Some history
- Usability in mobile devices
  - Introduction
  - Specificity
  - Interaction with mobile devices
  - Designing for mobile devices
- Conclusion

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Some history

- A phone until 1980

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Some history

- The Brick Era (1973 – 1988)
  - Large bateries (little network = large power)
  - Big, heavy, expensive, use limited to few user with very specific needs
  - Typically used in cars

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Some history

- The Brick Era (1973 – 1988)

Motorola 4500x (1988)

Motorola Dynatec 8000x (1983)

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Some history

- Candy Bar Era (1988-1998)
  - Leap in evolution
  - Thinner, rectangulars
  - Increase of the number of network = reduce power and dimension
  - Competitivity reduce costs
  - Mobile not only for voice: SMS.
    - Initially to send notifications to user (no cost)
    - Possibility to send messages with no or reduce costs when voice was still expensive.

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Some history

- Candy Bar Era (1988-1998)

Ericsson's GA628 (1996)

Nokia 1100 (1992)

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Some history

- Feature Phone Era (1998-2008)
  - New functionalities besides voice and SMS
  - GPRS appears (General Packet Radio Service)
  - Cameras, music …
  - First Web, with little expression (High costs, Little marketting) – WAP (Wireless Application Protocol)

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Some history

- Feature Phone Era (1998-2008)

Motorola V3 – 2004
130 Million units sold

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Some history

- Smart Phone Era (2002 - 2010)
  - What is a smartphone: unclear – same as feature phone plus:
    - Common OS, larger display, Qwerty keyboard or stylus, Wi-Fi
  - Not a success (10 a 15% global share)
  - Symbian OS and some services.
  - Kind of disappear in 5th era.

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Some history

Palm Treo 650 - 2004

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Some history

- Touch Era (2007 - ????)
  - 9 January 2007, I-Phone launch, neither mobile phone neither computer.
  - Possibility to download apps.
  - Internet use on phone (search, video,…)

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Some history

- Touch Era (2007 - ????)

Iphone
iOS

Samsung Galaxy
Android

Nokia W7
Windows Phone

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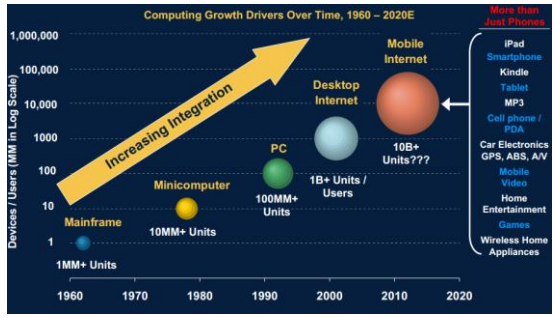
Some history

- What's next?



Morgan Stanley's analysts

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Usability in mobile devices

"The mobile phone is the most personal of personal computers"

Vic Gundotra, Google's VP Engineering

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Usability in mobile devices – a challenge

- In user testing, website use on mobile devices got very low scores, especially when users accessed "full" sites that were not designed for mobile.
- Mobile use is one of the biggest challenges now facing many websites.
- The user experience of mobile websites and apps has improved since our last research, but we still have far to go.

Jakob Nielsen

http://www.useit.com/alertbox/mobile-usability.html

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Desktop vs. Mobile

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Desktop vs. Mobile : Small Screen

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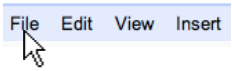
Desktop vs. Mobile: "Fat Finger"



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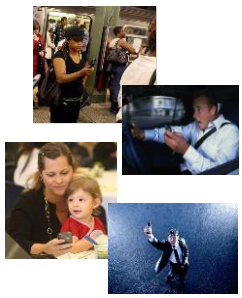
Desktop vs. Mobile: Context



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Mobile vs Desktop

	Mobile device	Desktop
Use	On the move, fast (voice, sms)	Task more complex, navigation, e-mail, etc.
Form	Small, in table/pocket	Needs a table, sit, possibly transportable.
Mobility	Used for mobility, battery life significative	Need cable or frequent charging
Connectivity	Slower with interruption	Faster and more reliable
Input	Challenge: touch	Keyboard and Mouse
Output	Small screen	Monitor with larger size and resolution
Storage	Still limited	Much superior

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Mobile devices specifity

- Often metaphors and interaction are adapted from computer solutions (icons, windows, aplications)
- Mobile devices have specifity that might be considered in aplication design:
  - Ambiental variations
  - Hardware limitations

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Ambiental variations

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Ambiental variations

Mobile device use is unpredictable and occurs in several contexts:

- temperature, climate, ilumination affects performance (attery, processing, readability)
- Noisy or distraction rich environments make interaction more difficult
- User can move and system must allow to continue interaction
- User might be doing another task while using the device
- User might need to manipulate othre objects during interaction

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Ambiental variations

- These variations are intrinsic to the use of mobile devices (not going to disappear with evolution)
- Fundamental aspects to be considered in prototyping, developing and evaluating the systems.

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Hardware limitations

- **Back to origins (memory, battery, processor)**

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Hardware limitations

- Mobile devices are a compromisse between portability and performance what limits their performance:
  - Slower, cheaper CPUs
  - Memory limitations
  - Battery limitations
  - Connectivity is unpredictable
  - Screen size is reduced – Main limitation regrading interaction.
- Many of these limitations improve but screen size will always be reduced

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Usability in mobile devices - challenges

- (input) Entry inadequate:
  - Difficult to operate na interface without mouse, interaction longer and with errors. Text entry particularly difficult.
- (output) Smal screens
  - Less visible options, STM overload making interaction more complex
- Bad interface design
  - Often optimized for computers with no adaptation for mobile devices.

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Input in mobile devices

- TouchScreen
- Other:
  - Microphone
  - Camera
  - Sensors (Accelerometers)
  - Bluetooth etc.

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Output in mobile devices

- Screen
- Sound
- Visual Artefacts (Light, blinking)
- Haptic interfaces (vibration)

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Output in mobile devices

Too much data for a too little display area

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Information presentation

- Main challenge, information presentation must be:
  - Short and concise
  - Carefully selected
  - Easy to read
  - Adapted to the situation

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Information presentation

- Avoid presenting too much information:
  - It use valuable space in the screen
  - Might distract user from what is relevant while doing another task
  - Might be difficult to read on the move

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Guidelines for mobile devices

- Everything we talked about
  - User compatibility
  - Task compatibility
  - Work-flow compatibility
  - Product compatibility
  - Feedback
  - Coherence
  - Familiarity
  - Simplicity
  - Flexibility
  - Control
  - Technology invisibility
  - Robustness
  - Error prevention

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Guidelines for mobile devices

- And a few more
  - Develop for users on the move
  - Use selection and not typing
  - Stability
  - Error prevention
  - Indicate clearly what are controls and what is static

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Guidelines for mobile devices

- Adapt / Reduce functionalities

Desktop	Mobile
Book flights	Check flight timetable
Information about a company	Direction to go to a given address
…	

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Simplify, Simplify, Simplify!

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Minimize text input

- Typing will always be slower

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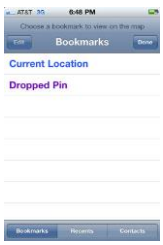
Minimize text input

- Use organization and intelligent entry system to reduce text entry



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Stability

- Consider possible interruptions (Conectivity, battery, etc) and allow to restore previous states.

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Error prevention

- Error are even more easy to occur
  - Undo
  - Back
  - Register current state to allow recovering,
  - …

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Some advantages

- Additional sensors and possible interactions
  - Truely personal
  - GPS

    Context based applications
  - Camera

    AR
  - Sensors (Inertial,)

    Gestures

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Conclusion

- Everything we talked about is still valid (Know the user, prototypes, evaluation, etc…)
- Some specificities imply more limitations and care in design:
  - small screens
  - fat fingers
  - poor text entry
- Open the way for other type of interactions
- Despite the attempts, keyboard and mouse continue faster and allow more interactions. It is also more ergonomic and efficient for prolonged use.

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