Design and Implementation of Mobile Applications

2019-20

Luciano Baresi
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• Professor @ DEIB
• Previously
  • Researcher at Cefriel
  • Visiting researcher
    • University of Oregon (USA)
    • University of Paderborn (Germany)
  • Visiting professor
    • University of Oregon (USA)
    • Tongji University (China)
• Research interests
  • Software engineering
    • Dynamic software architectures
    • Service- and cloud-based systems
    • Mobile applications

• http://home.deib.polimi.it/baresi/
Taught in English

No text book

No book can be written so quickly
Online material better than any book
Slides are available through my web page
When

Wednesday: 8:30-10
Thursday: 8:30-10

Who

Teaching assistant: Giovanni Quattrocchi
External guests (from industry)
Key ingredients

Mobile application design
Cross-platform development
Android
iOS
Project negotiation (not before end of October)

- You propose an idea
- Some proposals may be available

Some comments

- Novelty of idea is not key
- 1 or 2 people (exceptionally 3 persons)
- Expectations are becoming higher and higher
  - Complexity
  - Graphical layout
  - “multi-device” support
- Testing
- Quality of documentation
Final exam

Project discussion
• On official dates only

You must come with
• Your design document
• Elevator pitch
  • Short video, 30-60 seconds
• A short presentation
  • Brief introduction and design decisions
• A demo (real device or simulator)
  • Some measures about your project

Synergies are encouraged
I would like to get

A well-engineered significant app

- Some screens (significant application flow)
- Multiple threads
- Interaction with external services (not just Facebook)
- “Nice” look and feel
- Support for different classes of devices

Earlier does not mean higher grades

You keep any possible right on the app
A bit of history
Dr. Martin Cooper of Motorola, made the first US analogue mobile phone call on a larger prototype model in 1973.
Parrot FLOWER POWER

L’incredibile sensore che misura i bisogni delle tue piante e ti avvisa sullo smartphone
Cloud integration

Cloud computing

Application
- Monitoring
- Content
- Collaboration
- Communication
- Finance

Platform
- Object Storage
- Identity
- Runtime
- Queue
- Database

Infrastructure
- Compute
- Block Storage
- Network

Laptops
- Servers
- Desksops
- Phones
- Tablets
It is not just this
How about this?
What can we think of?

- New fruition channel
- Nice and addicting solution
- Simplified solution
- New idea?
Now you can play with your hands

Put your iPad in the Osmo base with the red reflector over the camera – and now it can see what’s in front of it.

Osmo
Postal orders through pictures
... and some numbers
<table>
<thead>
<tr>
<th>Operating System</th>
<th>2Q18 Units</th>
<th>2Q18 Market Share (%)</th>
<th>2Q17 Units</th>
<th>2Q17 Market Share (%)</th>
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<tbody>
<tr>
<td>Android</td>
<td>329,503.4</td>
<td>88.0</td>
<td>321,848.2</td>
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<td>iOS</td>
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<td>11.9</td>
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<td>12.1</td>
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<td>433.1</td>
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<td><strong>Total</strong></td>
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<td><strong>100.0</strong></td>
<td><strong>366,596.1</strong></td>
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</table>

Source: Gartner (August 2018)
Complex device

- Accelerometer
- Gyroscope
- Digital compass
- Global Positioning System (GPS)
- Barometer
- Ambient light
- Proximity Sensor
Many different languages

- Objective-C/Swift (iOS)
- Java/Knockin (Android)
- C# (cross-platform development)
- HTML5 (cross-platform development)
- JavaScript (cross-platform development)
- C++ (Tizen)
<table>
<thead>
<tr>
<th>Version</th>
<th>Code name</th>
<th>Release date</th>
<th>API level</th>
<th>Runtime</th>
<th>First devices to run version</th>
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<tr>
<td>10</td>
<td>10</td>
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<td>August 22, 2016</td>
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<td>4.4</td>
<td>KitKat</td>
<td>October 31, 2013</td>
<td>19</td>
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Legend:  - Old version  - Older version, still supported  - Latest version  - Latest preview version  - Future release
Versions

- Android Pie 9.0 is the most used Android, at over 32%, more than twice as popular as the next popular single version (Oreo 8.1)
- On tablets only, Android Lollipop 5.1 is the single most used version at 23.11%.
  - A recent Oreo 8.1 is most used in e.g. China, Sweden and Angola

https://en.wikipedia.org/wiki/Android_(operating_system)
Italy

GOLD - 8

Fabio BASILE
Judo
Men -66 kg

Daniele GAROZZO
Fencing
Men's Foil Individual

Niccolo CAMPRIANI
Shooting
10m Air Rifle Men

Diana BACOSI
Shooting
Skeet Women

Gabriele ROSSETTI
Shooting
Skeet Men

Italy has competed in every edition except...
A mobile app should do one thing and do it well

A mobile app should be as simple as possible, but no simpler

Different versions (families of applications)