Software Engineering for Mobile Application Development

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Outline

Backstory

Platforms

**SE Research Areas [1]**
- Universal Interfaces
- Software Reuse
- Need for Self-Adaptive Requirements

Future

Questions for Midterm
Backstory

- "Wild" growth in smartphone market
- First computer for many people
- Increased adoption of web-based services through mobile
- Users spending a chunk of time on mobile
- We have an app for everything now!
**Bottomline**

Mobile deserves it’s own branch of Software Engineering
Platforms

- Android
- iOS
- Blackberry
- Windows Phone
Android

- Fragmented OS - \{2.1, 2.2, 2.3, 2.3.3, 3.0, 4.0, 4.1, 4.2\}

- Different Devices - \{size, hardware, color\}

Solving Android’s problems = Solving everybody else’s*
* Except Windows

- Metro is a disaster

- Who needs two Dropbox apps in the same PC?

Some problems are self-inflicted and need not be solved.
Reiterate

- Mobile is at a nascent stage
- Too many problems
- We should be picky in what we want to solve
SE Research Areas [1]

- Universal Interfaces
- Software Re-use
- Self-Adaptive requirements
Universal Interfaces

HTC alone has 12 different screen size / resolution combinations on Android.

Simple tricks like scaling are not effective.
Side Nav bar
Pull down to refresh
Software Reuse

- PC Era - Develop only for Windows
- Mobile Era - Website + iOS + Android + Android + Windows + above

Managing multiple codebases is an issue.

Current solutions: Phonegap
Need for Self-Adaptive Requirements

- Battery life
- Processor speeds
- Front camera
- Display size
- Active Radios
- Location of device
- Fluctuating power levels
Non-functional requirements cannot be rigid for mobile devices.

Current solutions: SDK’s take care of most issues for native apps.
Future

Wouldn’t it be great if we have solutions ready for tomorrow’s problems?
My Divinations!
Convergence

- Convergence of operating systems is the future
- Mobile + Desktop + Tablet
- Different form factors share a single operating system
No not Metro!

- It's actually diverging
- Metro and Desktop interface in the same operating system
- Maybe Windows Blue will be different
Maybe Ubuntu...

- Ubuntu for Desktop
- Ubuntu for Phones
- Ubuntu for Tablets
- Ubuntu for Android
- Ubuntu for TV
Or Google...

- Chromebook
- Chrome
- Android
Definitely Apple!*

*Speculation

- No signs of convergence right now
- iOS and OSX are different
- Remember PowerPC to Intel transition
(Important)$^2$

- Consistent user experience on multiple form factors
- Code reuse for apps on multiple form factors
- Adaptive requirements for multiple form factors

Right now mobile apps aren’t complex.

We have Software Engineering processes for Desktop apps

We’ll need solutions in the future when they converge
Questions for Midterm

- Name three important areas for research in Software Engineering for mobile app development.

- What are self-adaptive requirements and why are they necessary?
References

Questions?

Vamsi Raju for GSA! Vote for me!