Whither the Smartphone?

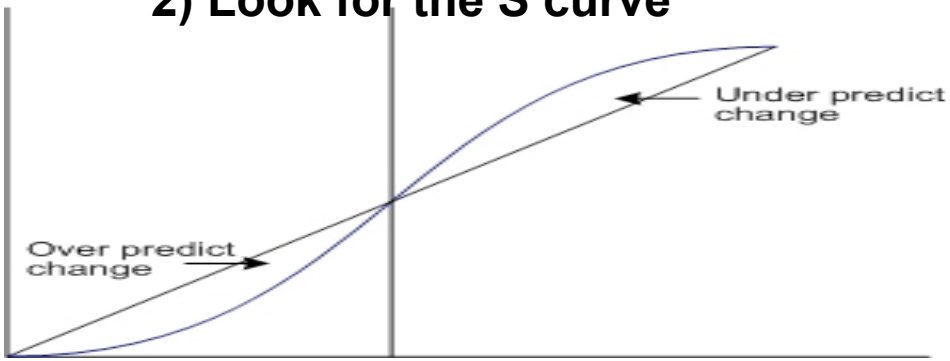
Future directions in smartphones and mobile development

Futures in Smartphone Development

- What are smartphones today
- What is mobile development today?
- What is the smartphone in five years?
- What does smartphone development look like then?
  - *Based on what those devices do*
  - *Based on what software development trends that make sense to adopt*

Saffo's Rules of Forecasting

2) Look for the S curve



4) Hold strong opinions weakly

- One guy at InfoQ: "can you do a talk on what the mobile development looks like in five years?"
- Another guy at InfoQ: "who are you to make such pontifications?"
  - *Adjunct professor at Carnegie Mellon-first graduate program in mobility research*
  - *Led development of first mobile browser with Ajax at Good*
  - *Started first "smartphone app framework"*
- But I'll still overpredict

Today's Smartphone

- Smartphone sales exploding
- Mobile app usage is finally taking off
  - *The Apple AppStore nailed the purchasing/provisioning/ security experience*
  - *Users demand apps now vs. being pushed earlier*
  - *Carriers and other impediments are irrelevant now*
- Today's devices have all the senses of people
  - *Sight, Hearing, Touch, Location-awareness*
  - *Enabling a new generation of apps not seen on other computing platforms*
- Users prefer apps on smartphones already
  - *http://www3.ipass.com/about/news-room/mobile-workforce-report/*

But …mobile development still in the stone age

Today's Mobile Development

- **Third generation languages**
  - *Objective C?*
  - *Non standard versions of Java, C++*
- **No frameworks**
  - *MVC for web development is ubiquitous*
  - *But hasn't made it to mobile development*
- **Earlier efforts are portability are obsolete**
  - *Runtime platforms (Gears, Air, Flash, etc.) not acceptable on AppStore*
  - *Not necessary anyway in days of modern smartphone*
- **Synchronized data critical for enterprise usage**
  - *Very rare on App Store*
  - *Still difficult ad expensive to implement*

Future Smartphone Devices

Will be as powerful as servers

- The shift to the edge is real and persistent

Will have senses

- Sensors
- Location services
- HD audio/video capture
- Voice driven
- Near field communications

Will evolve

- Better displays
- Size diversity
- More device operating systems

More Powerful Processors

- iPhone4
  - *SGX545 Graphics chip: OpenGL 3.2, Open CL 1.0, 200 mhz, DirectX 10.1, HD output*
  - *5MP camera*
  - *OLED display*
- Intel Atom "Moorestown" platform
  - *Half the power active usage. 1/50th in idle mode*
  - *Lincroft SystemOnChip with 3D graphics accelerator*
- Solving idle mode power usage and heat dissipation will enable multiple processors

Prediction: the smartphone driven push back to the edge will still be there in five years

Sensors in Smartphones

- Image sensors
- Motion sensors
- Magnetic sensors
- Touch sensors
- Proximity sensors – need to open APIs
- Environment sensors
  - Temperature/pressure/moisture/chemical
  - Air quality: Intel Labs Berkeley: http://news.cnet.com/8301-13924_3-10466590-64.html (today)
- Biometric sensors
  - fingerprint, retinal
  - E.g. LG Expo with projector and fingerprint sensor

Prediction: one in all of these categories will appear on every phone in five years.

Better Displays

- HTC Legend (yesterday)
  - 3.2" 320x480 AMOLED
- Samsung Wave
  - 3.3" AMOLED
  - 1 GHZ processor

Prediction: Display quality will make smartphone delivered video a money making category in 2011

HD Audio/Video Streaming

- Samsung Wave captures HD video (1024x768)
- Audio/video/text/IM from your device
- Sufficient network speed yields server-based voice processing

Prediction: Dedicated communicator apps to audio/video inside apps

Voice Driven

- See Android 2.1 and the Nexus One for search today (phrase oriented)
- This will be in every app
  - And not just server based
- Translation apps
  - Jibbigo
  - Google promises one for Android that uses phrase oriented voice driven search

Prediction: Voice will still be primarily for command in five years not free text

Near Field Communications

- Enables smartphones for casual purchasing
- Establishing users identity quickly
- Being aware of other devices for peer to peer interaction
  - E.g. contact exchange
  - More shift to the edge in processing

Prediction: near field communication appears on every smartphone OS by March 2011

Size Diversity

- Tablets
  - iPad – allowing iPhone SDK
  - Meego – Moblin/Maemo for tablets being used for highend smartphones
- Other form factors
  - Booklets? (eReader size)
  - Also with smartphone capabilities

Prediction: smartphone form factor will still dominate by more than an order of magnitude next year and onward

Device OS Diversity

- Meego
- Samsung Bada (in Wave)
- Pure play Linux will emerge
- Windows Mobile not going away

Prediction: There will be seven major smartphone operating systems next year

New Phone Capabilities -> Tools and APIs

- Sensors, multiple apps -> Event based programming model
- Multiple processors -> Concurrent programming languages and algorithms
  - Smartphones are a chance for a fresh start
- All capabilities across multiple devices -> common APIs

Prediction: Standards bodies won't have any of these capabilities in five years

Techniques to Handle Display Diversity

- MVC!
- Conditionals in views
- Automatic routing amongst views
- Intelligent component rendering

Modern Development Goodness for Mobile?

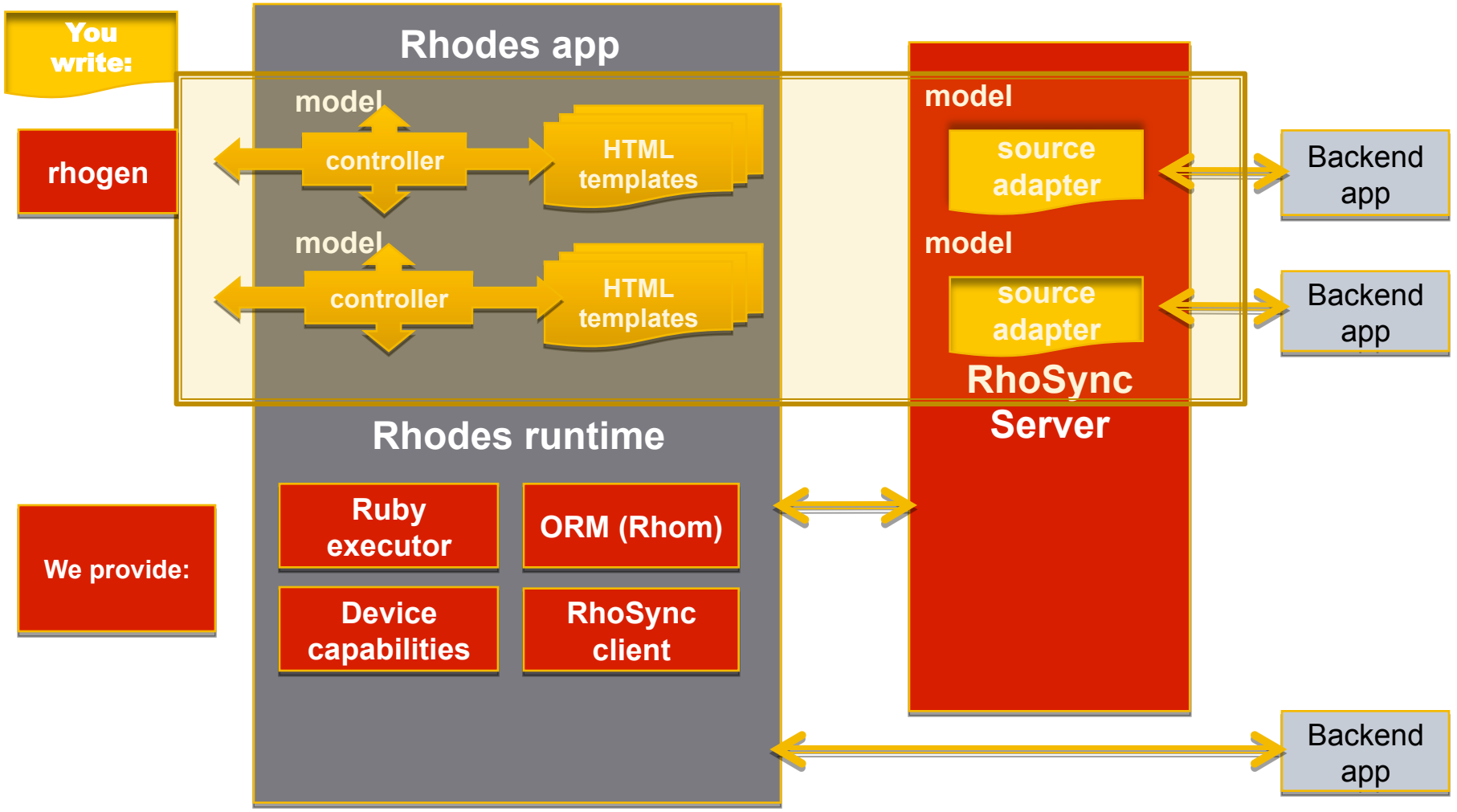
- MVC Frameworks
- Object relational managers
- Hosted/cloud development
- Open source
- Non-relational DBs?
- Functional programming languages?

Hosted Services for Mobile Development

- Allows builds for device diversity
- App provisioning and device management to multiple devices
- Hosted sync servers, media servers
- Collaboration on development over the web
- Examples: rhohub.com, appmakr

Prediction: Next year over one hundred thousand developers will be using a hosted service to write smartphone apps

Rhodes Architecture



Summary

- The smartphone is the most significant shift in computing since the web, but bigger
  - Smartphones are extensions and personifications of individual's senses and identity
- This will drive massive innovation in the smartphone device
- That innovation will drive tools, APIs and standards in development
- The success of smartphone app industry will finalize modernize the development technology used by the industry

Backup

Why Rhomobile?

- **Rhodes Runs Everywhere**
  - Write once – run on every smartphone
- Only MVC framework for smartphones
  - Use web development skills to write NATIVE apps
- Only framework with sync
  - enables smartphone usage in the enterprise
- Only Development as a Service for mobile
  - Write apps without installing SDKs locally

Device Capabilities Matrix

Capability	iPhone	Android	BlackBerry	WinMo	Symbian
Geolocation (GPS)					
PIM Contacts					
Camera					
Date/Time Picker				2.0	2.1
Tab Bar/native menu				2.0	2.1
Audio/video capture	2.0	2.0	2.0	2.0	2.1
Push		2.0		2.0	2.1
Native Maps				2.0	2.1
Alerts/audio playback				2.0	2.1
Landscape	2.0	2.0			2.1

Rhodes Versus Other "Me Too" Frameworks

- Only one that supports all devices
- Only one with synchronized data
- Only MVC framework
- First Ruby on the device
- First and only hosted development service for mobile