MOCO COMP5216

MOBILE COMPUTING

THE UNIVERSITY OF
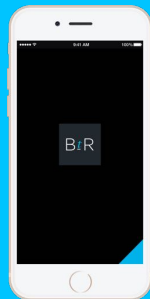SYDNEY

Week02 | Semester 2, 2016

Mobile App Development

Coding a Career in Mobile Apps

Nick Randolph | Built to Roam Pty Ltd

B*t*R

We build apps to keep you *roaming*;
anytime, anywhere, any device

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BUILT *to* ROAM

- 10+ years mobile development
- Sole Proprietor
  - Interest in mobility
  - Specialist in Windows Mobile
  - Industry involvement

- Built to Roam
  - Evolution of Windows
  - Microsoft ecosystem
  - Cross platform

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What is mobile?

- History of computing
  - mainframes, workstations, pc's
  - phones, smaller phones, larger phones
  - tablets, phablets
  - watches, glasses…
- Is mobile about
  - device size?
  - location?
  - connectivity?

Internet of Things

- Billions of connected devices
  - Smart – phones, cars
  - Dumb – lights, sensors

Attributes of mobile?

- What's the point of being mobile?
  - Data when and where you need it
  - Consumer v's Enterprise
 - Entertainment v's Work
  - Pokemon Go v's Email

What's an app?

- *An application is any program, or group of programs, that is designed for the end user.*
  ref: http://www.webopedia.com/TERM/A/application.html

- Systems software (aka Operating System)

- Applications software (aka end-user programs)

Applications aren't new

- Console applications
  - Lots of banks and government departments
  - No GUI
- Desktop applications
- Phone applications
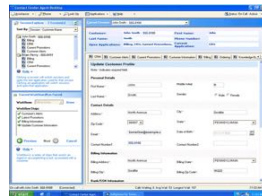
What's a mobile app?

- What does it run on?
  - Desktop, Laptop, Tablet
  - Mobile phone
  - Accessory - Watch, Glasses
- Where does it run?
  - Home, Work, On the train, In a plane?
- Where does the data come from?
  - Packaged with the app
  - Downloaded
  - Service
  - Cached locally

Development Environment

Ecosystems

- Target platform
- Development platform
- Tools
- Services

Apple

https://developer.apple.com

- iOS
- MacOS
- TvOS
- WatchOS

Google (aka Android)

https://developer.android.com

- Android
  - Phone
  - Tablet
- Wear

Microsoft

https://developer.microsoft.com

- Windows
  - Desktop
  - Mobile
  - Xbox
  - Team
  - IoT

Development Tools

- Source Control
- Defect/Issue Tracking
- Task/Project Management
- Build
- Deployment
- Testing

```html
<!DOCTYPE html>
<html id="home-layout">
  <head>
    <meta http-equiv="content-type" cont
    <title>Source Code Pro</title>
      <!-- made with <3 and AFDKO -->
    <meta name="keywords" content="sans,
      monospace, open source, coding, fo
    <link rel="stylesheet" type="text/css
  </head>
  <body>
    <div id="main">
```
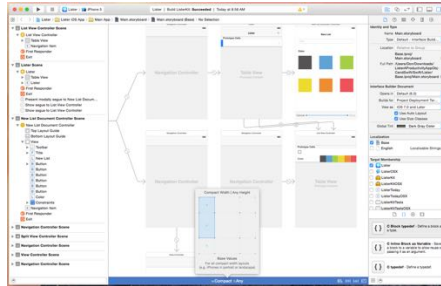
iOS Tools

- Xcode (inc. Interface Builder)
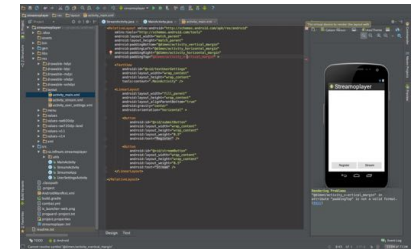- Objective C / Swift /
  C++ / Storyboard
- Simulator

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Android Tools

- ADK
- Eclipse, Android Studio (and others)
- Java / C++ / AXML
- Android Emulator

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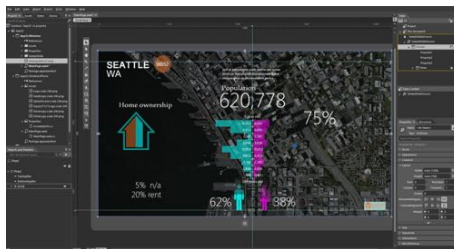## Windows Tools

- Visual Studio (inc. Blend)
- C# / VB.NET / C++ / XAML / Javascript
- Emulator (mobile), Simulator

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Cross Platform: The Holy Grail

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Cross Platform Development

- Every device, shape and size?
  - Eg Netflix or Stan

Cross Platform Choices

- Adaptive Websites
- Wrapped Website
- Cordova/PhoneGap
- Xamarin.Forms
- Xamarin Traditional

| HTML5, JavaScript, CSS (Web) | Web/Native Frameworks (Hybrid) | Objective C, Java, C# (Native) | Cross-Platform Frameworks (Xamarin) |

Adaptive Websites

- Responsive Design
  - Eg Bootstrap

Wrapped Websites

- Hosted Web App
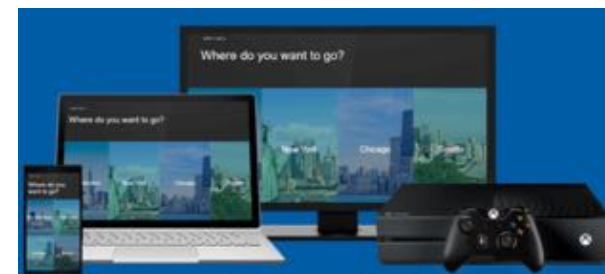
Cordova / PhoneGap

- Apache Cordova
- Adobe PhoneGap

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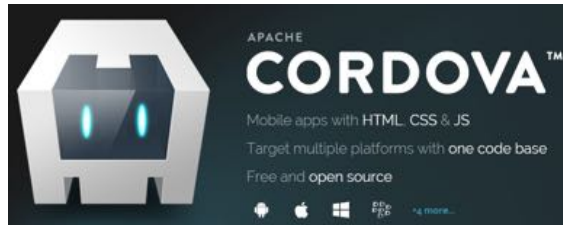
Xamarin (traditional)

- MonoTouch
- MonoDroid
- Windows
- PCL

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Xamarin.Forms

- PCL or Shared
- Platform Customisation
  - Custom renderers

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Let's Build An App!

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What does your app do?

- One purpose
  - Do one thing well, rather than multiple things poorly

Core Scenarios

- Walk through 2-3 core scenarios that the user would want to achieve
  - Eg. Make an order
  - These are the scenarios you need to make easy
- Ignore non-core scenarios
  - Edit an existing order
  - These scenarios can require more clicks
  - The user will look for these, so can be in menus or toolbars

Wireframes

- Each screen of the application
- Core elements of each screen (ie what data/info)
- Connections between pages (direction of navigation)
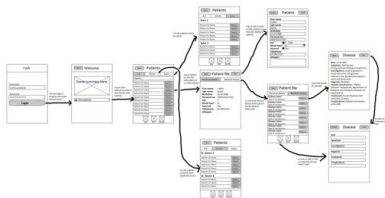
Design

- Every page/view, or just key pages
- Colours, Fonts, Sizes

Device Characteristics

- Form factor
  - Mobile, Desktop, Tablet
  - Orientation: Portrait, Landscape
- Resolution
  - Physical size
  - DPI

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Where's my data?

- Local v's Service
- Always online / Occasionally Connected
- Traditional
  - N-tier
  - Service, Logic, Database
- Cloud
  - Eventual consistency
    - Relational database
    - DocumentDB / Big data
  - High performance
    - Blob/Redist
  - Disconnected processing / Cacheable data

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What To Build First?

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Scheduling

- Planning/Scoping/Requirements
- UX/Wireframe/Design
- Development
- Testing
- Deployment

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Depth First

- Every margin
- Every font
- Every alignment

Breadth First

- All pages
- Navigation

Testing

- Allow for testing
  - Unit (code)
  - Integration
  - UAT

Deployment

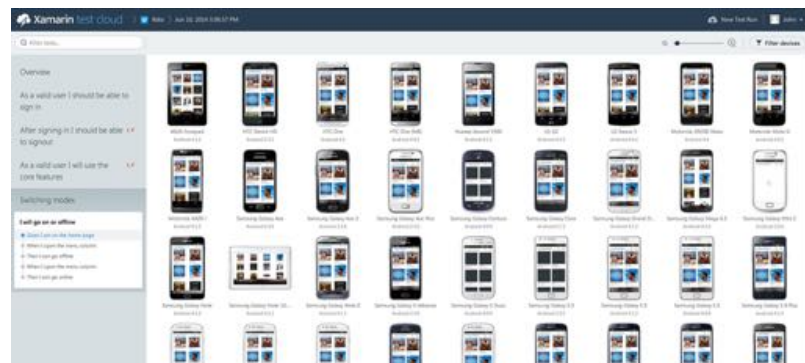## Packaging

- iOS   .ipa
- Android .apk
- Windows .appx

Deployment

- Side-loading
- Testing tools
- Enterprise Distribution

Testing

Publishing

- iTunes
- Google Play Store
- Windows Store

Analytics

- HockeyApp
- Google Analytics
- Flurry
- Application Insights (services)

Show Me the Money!

Monetisation

- Paid for
- In-app Purchase
- Subscription
- Ads

Free v's Paid

In-app Purchases

- Where do you think Pokémon Go makes money?
  - Purchases
  - Data

Ads

- Banner
  - Standard Ad Units
  - Expandable
  - Interactive
- Video
  - VAST Video

- Medium Rectangle (300x250px)
- Rectangle (180x150px)
- Leaderboard (728x90px)
- Skyscraper (160x600px)
- Half Page Ad (300x600px)
- XXLarge (320x50px & 320x53px)

- XLarge (300x50px & 300x75px)
- Large (216x36px & 216x54px)
- Medium (168x28px & 168x42px)
- Small (120x20px & 120x30px)
- Micro Bar (88x31px)
- Text Ad Units

Thank you!