

Developing Mobile Multimedia Apps

Botanic: A Case Study

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Outline

- Meta-Media
- Mobile Applications *Part 1*
- Methodology

- Tools & Techniques *Part 2*
- Botanic: A Case Study

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New Media <Meta-Media>

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A Revolution in Process

- Informatics + Telecommunications
- Digital Content
- Interactive Interfaces
- Virtual Communities
- Big Data
- Internet Services

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Trends in Hardware

- Processing
 - Parallelism
- Memory
 - Unlimited
- Network
 - Pervasive
- Data (I/O)
 - High Fidelity

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Software Perspectives

- Interoperability
 - Standards
- Distributed Computing
 - Agents
- Smart Interfaces
 - Avatars
- Augmented Reality
 - Immersion

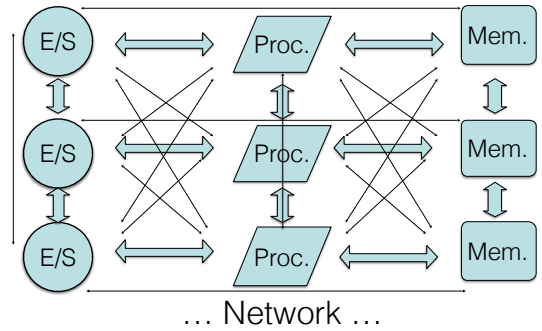
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Product Directions

- Ubiquity
 - Various Kinds
- Portability
 - Miniaturization
- Connectivity
 - Multimodal
- Design
 - Form and Function

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Meta-Media



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Challenges

- Integration
 - Technologies / Data / Areas
- New Paradigms
 - Computation / Languages / Interface
- Applications
 - Personal Satisfaction
 - Social and Cultural Insertion
 - Business Models

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Mobile Applications

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What's Different Now?

- Desktop
- Web
- Mobile



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Specifics of Mobile Apps

- Portable
 - Phone / Tablet / Watch / ...
- Networked
 - Cellular / Wifi / Bluetooth
- Sensors
 - GPS / Accelerometer / Compass
- Media
 - Cameras / Audio / Display

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A New Platform

- Ubiquitous
 - Outdoors / Indoors / Vehicle
- Natural Interface
 - Multitouch / Proximity
- High Quality A/V
 - Stereo Sound / HD Video / Megapixel Photo

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Interactive Media Devices

- Gesture / Sketch Interaction
- Real-Time 3D Graphics
- Pictures / Movies
- Music / Podcast
- Rich Text

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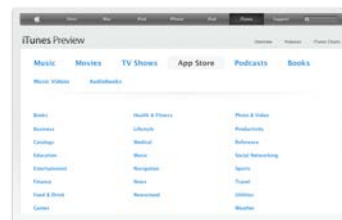
Graphics & Vision

- Games
- Augmented / Virtual Reality
- Computational Photography
- Media Authoring / Performance
- Social Networks

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App Types

- Many...



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Our Focus

Themes

- Art / Entertainment
- Navigation / Travel
- Music / Photo
- Social

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The Botanic App

- Tom Jobim and Botanical Garden



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Methodology

App Lifecycle

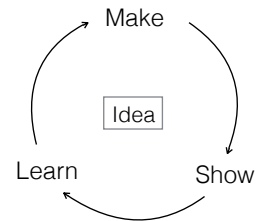
- Design
- Development
- Testing
- Deployment
- Maintenance

case study...

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The Real Picture

- Feedback Loop



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Tools and Techniques

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System Platform

- Hardware / Software
 - Apple / iOS
- Form-Factor
 - iPhone / iPad Mini
- Capabilities
 - Navigation / Media / Interaction

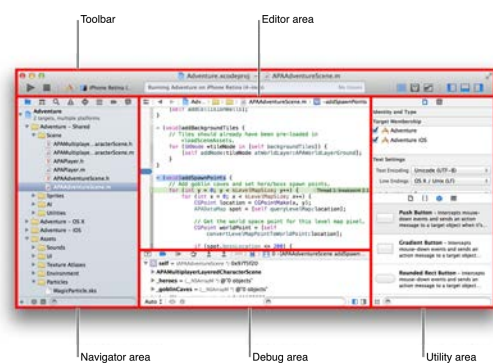
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Development Environment

- IDE
 - Xcode / Interface Builder
- Language
 - Objective-C / C++
- Revision System
 - Git

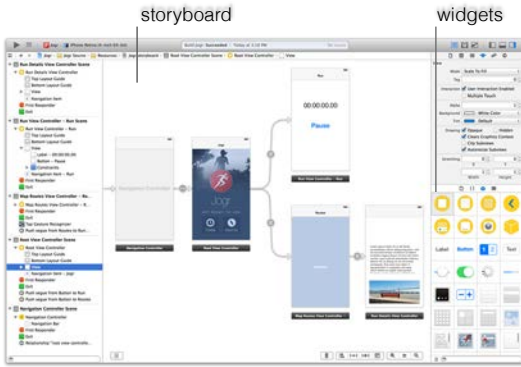
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Xcode



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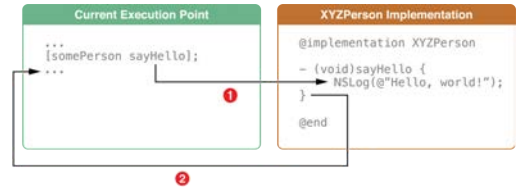
Interface Builder



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Objective-C

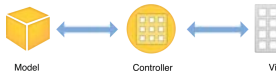
- object-oriented language (Smalltalk + C)



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Design Patterns

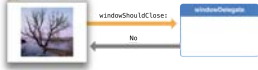
- Model-View-Controller



- Target-Action



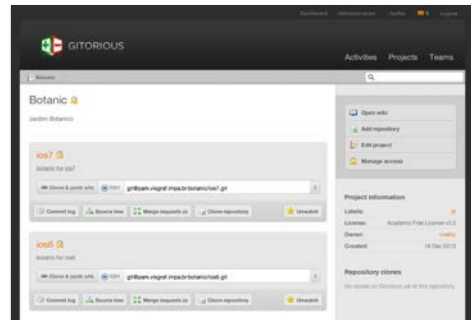
- Delegation



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Git

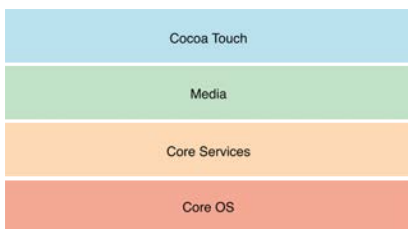
- revision control system



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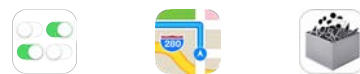
Frameworks

- Layers of iOS Technologies



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Cocoa Touch Layer



- UIKit
- MapKit
- TextKit

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Media Layer



- AV Foundation
- Media Player
- OpenGL ES
- OpenAL

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Core Services



- Core Foundation
- Core Data
- Core Location
- Core Motion

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iOS SDK

- Xcode + iOS Simulator



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Production Tools

- Image
 - Photoshop
- Video
 - Final Cut X
- Animation
 - After Effects
- Etc....



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Botanic

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Genesis

- The Book



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The Book

- Meu Querido Jardim Jardim Botânico



poetry

photographs

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Motivation

- Research
 - *new media*
 - Experimentation
 - *mobile platforms*
 - Practice
 - *real apps*
- (* innovation cycle)

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Why

- Macro / Micro Navigation
 - Jardim Botânico
- Rich Media Content
 - Espaço Tom Jobim



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What

- Information
 - Visitor's Guide
- Navigation Tool
 - Map / Tours
- Data Collection
 - Photos / Notes

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How

- Design Choices
 - iOS / iPhone
- Functionality
 - Information / Exploration / Sharing
- Multimedia Content
 - Poetry / Music / Photos

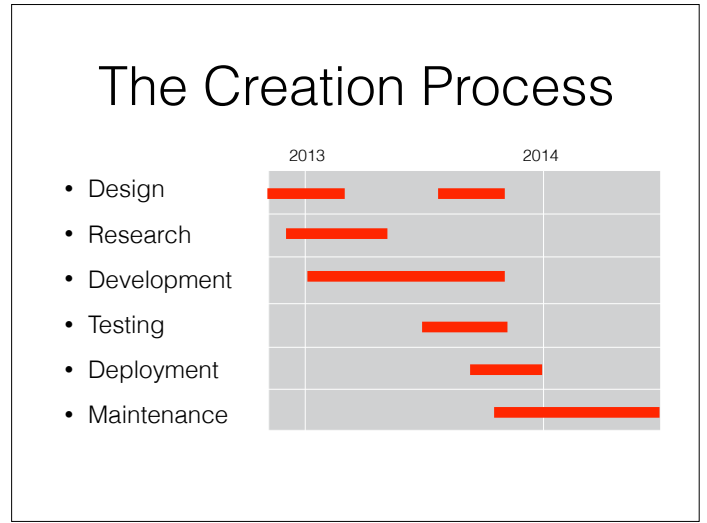
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Case Study

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Design

- Concept
- Background Research
- UI Design
- Visual Style




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Concept

- Inspire / Explore / Share

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Background..

- Related Apps (circa Feb. 2013)
 -  Kew Gardens - London
 -  Garden Guide of Chicago
 -  Memphis Botanic Garden
 - ...

mostly just information!

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User Interface - I

- Basic Structure


```

      graph TD
      mode[mode] --- info[Info]
      mode --- visit[Visit]
      mode --- data[Data]
      
```
- Flow

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User Interface - II

- Complete Structure



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User Interface - III

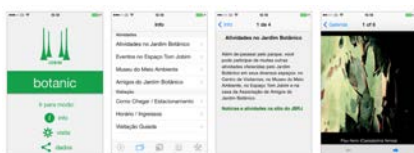
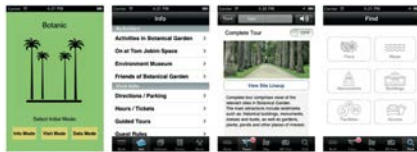
- Element Design Evolution (ex: Map View)



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Visual Style

- iOS 6
- iOS 7



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Research

- Maps
- Augmented Reality
- 360° Panoramas
- Media & Animation

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Maps - I

- No available GIS data!



Hardcopy from JB



Google Maps

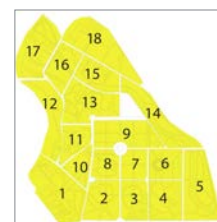
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Maps - II

- Construction Steps



main alleys



zones

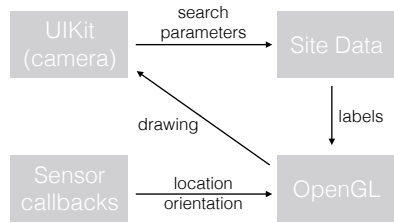


buildings and sites

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Augmented Reality - I

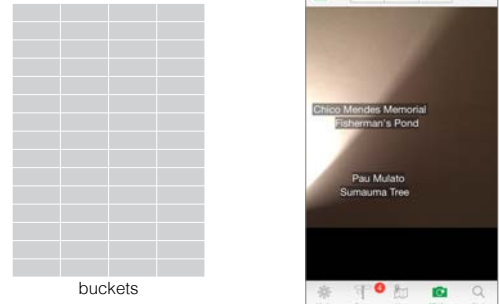
- Software Architecture



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Augmented Reality - II

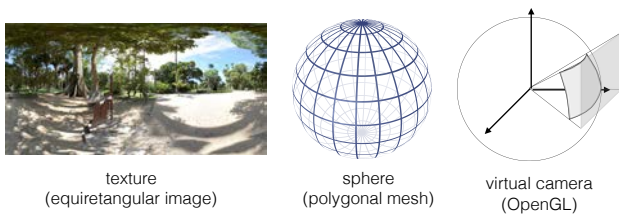
- Labels on Screen



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360° Panoramas - I

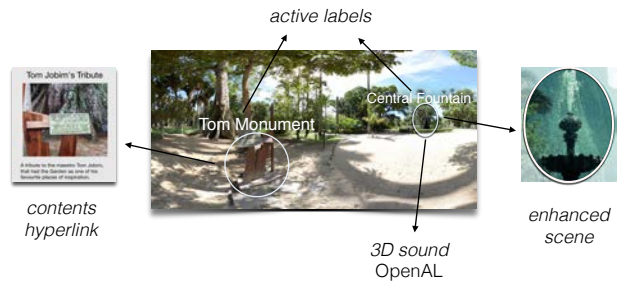
- Representation and Rendering



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360° Panoramas - II

- Interactive Augmented Reality



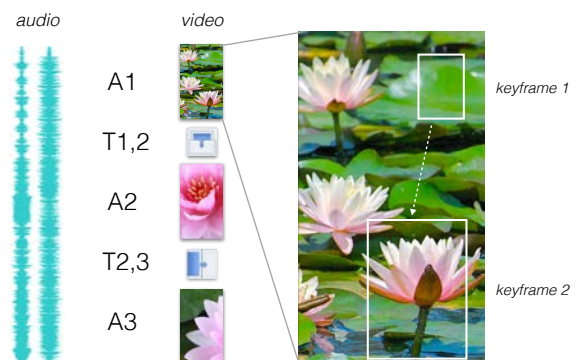
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Animation - I

- "Uber Media" Engine
 - Sequence of Image Based Animations (Ken Burns Effect)
 - Transition Between Animations
 - Synchronized Audio
- Simple Authoring Language
 - Key-Frame based

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Animation - II (example)



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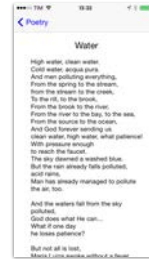
Development

- Planning / Integration
- Content Production
- Implementation

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Content Production

- Curatorship Selection from the Book



poems



photos

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Implementation

- Apple Frameworks
 - UIKit
 - MapKit
 - Core Location
 - Core Motion
 - Core Data
 - OpenGL
 - OpenAL
 - AV Foundation
- Other Frameworks
 - Open Flow
 - F-Gallery

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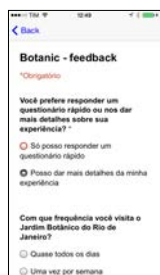
Testing

- Internal Evaluation
- Ad Hoc Tests
- Validation

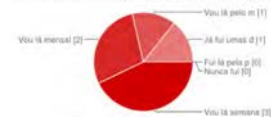
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Ad-Hoc Test

- In-App Feedback + Google Web Form



Com que frequência você visita o Jardim Botânico?



Você já semanalmente	43%
Você já mensalmente	29%
Você já pelo menos uma vez por ano	14%
Já fui umas duas ou três vezes	14%
Fui lá pela primeira vez para testar o Botanic	0%
Nunca fui	0%

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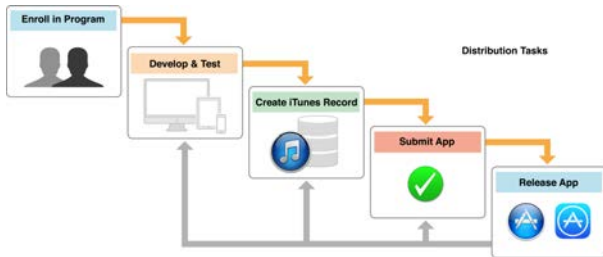
Deployment

- Distribution
- Marketing
- Advertising
- Press

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App Store Distribution

- Apple Developer + iOS University Program



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Marketing

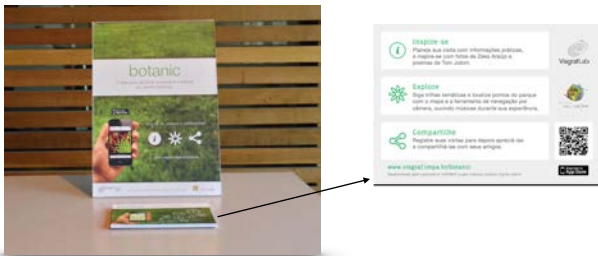
- App Store + Website and Video



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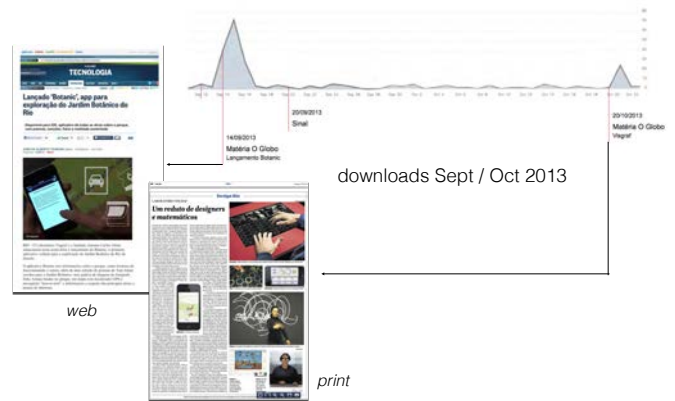
Advertising

- Poster / Flyer



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Press



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Maintenance

- Revisions
 - version 2.6
- Follow-up
 - New Content

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Mediatic Tours

Inspired by Tom Jobim

- Tom's Morning Stroll
 - Multimedia
- Touring the Garden with Tom Jobim
 - Video

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Demo

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Video

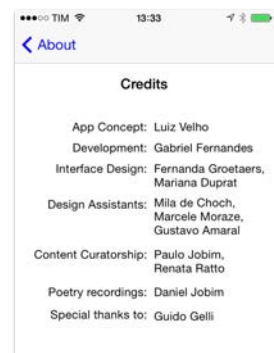
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Future Directions

- Institutional Content
- Data Management
- Content Authoring
- Social Network

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Acknowledgments



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Questions ?

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