

Development of Mobile Applications for New Media

Luiz Velho
IMPA

1

Outline

- Meta-Media
- Mobile Applications
- Three Case Studies

2

New Media <Meta-Media>

3

A Revolution in Process

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

4

Trends in Hardware

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

5

Software Perspectives

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

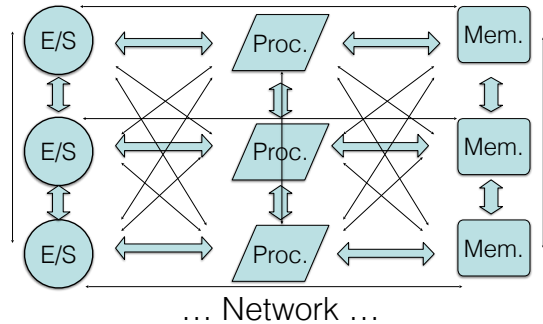
6

Product Directions

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

7

Meta-Media



8

Challenges

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

9

Mobile Applications

10

What's Different Now?

- Desktop
- Web
- Mobile



11

Specifics of Mobile Apps

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

12

A New Platform

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

13

Interactive Media Devices

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

14

Graphics & Vision

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

15

Our Focus - New Media

Themes

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

16

Methodology

App Lifecycle

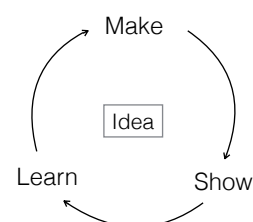
- Design
- Development
- Testing
- Deployment
- Maintenance

case studies...

17

The Real Picture

- Feedback Loop



18

Case Studies

19

App Frameworks

- Music
 - Blues Machine
 - Lattice
- Exploratorium
 - Botanic
- Exhibits
 - Tom Jobim: Music & Nature
 - Olhar 3D

20



21



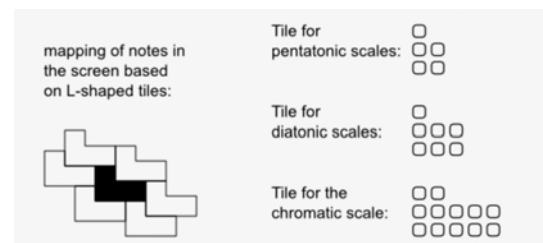
22

Short jingle in G
(minor pentatonic scale)
performed in Lattice

23

New Music Instrument

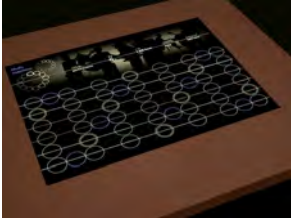
- Two-Dimensional Tiling
- Multi-Touch



24

Blues Machine

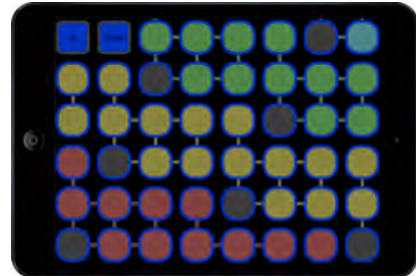
- iTable
- iPhone



25

Lattice

- iPad



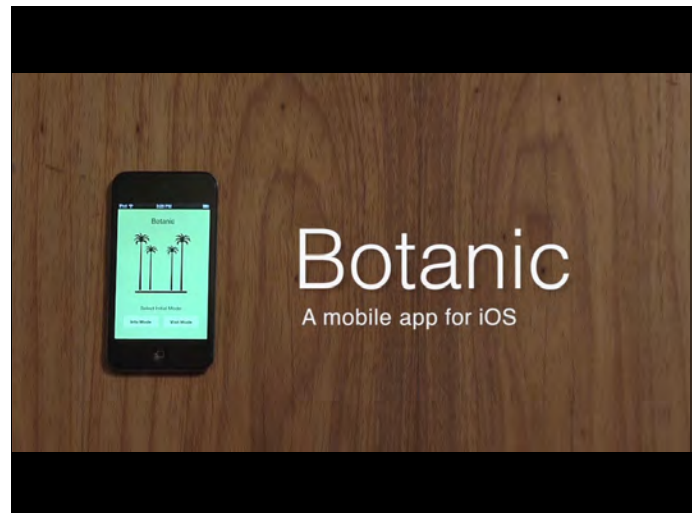
26

The Botanic App

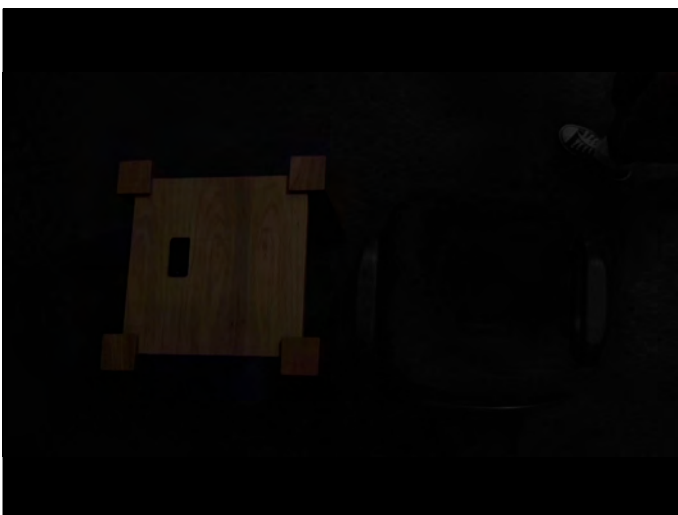
- Tom Jobim and Botanical Garden



27



28



29

Genesis

- The Book



30

The Book

- "My Beloved Botanical Garden"



poetry

photographs

31

Motivation

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

32

Why

- Macro / Micro Navigation
 - Botanical Garden (JB-Rio)
- Rich Media Content
 - Tom Jobim Space (IACJ)



33

What

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

34

How

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

35

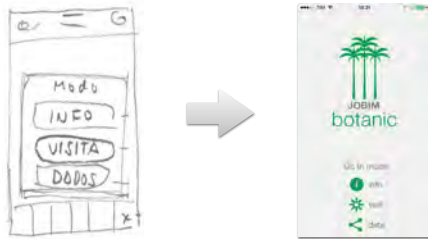
Design

- Concept
- UI Design
- Visual Style

36

Concept

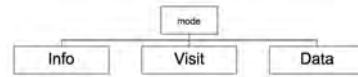
- Inspire / Explore / Share



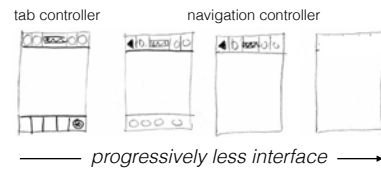
37

User Interface - I

- Basic Structure



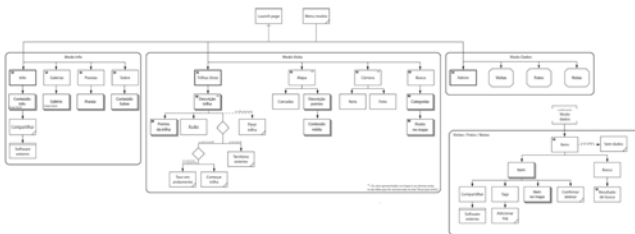
- Flow



38

User Interface - II

- Complete Structure



39

Visual Style I

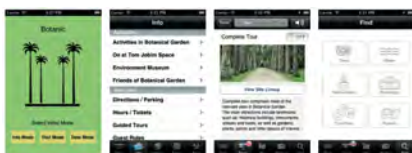
- Element Design Evolution (ex: Map View)



40

Visual Style II

- iOS 6



- iOS 7



41

R&D

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

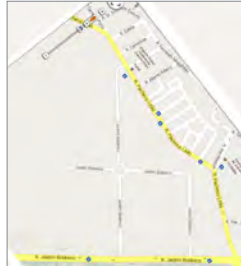
42

Maps - I

- No available GIS data!



Hardcopy from JB



Google Maps

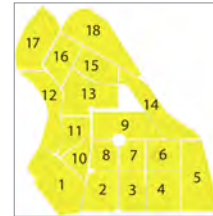
43

Maps - II

- Construction Steps



main alleys



zones

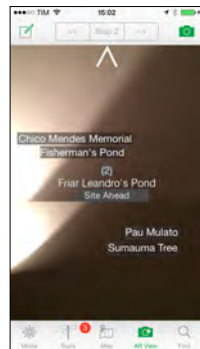


buildings and sites

44

Augmented Reality - I

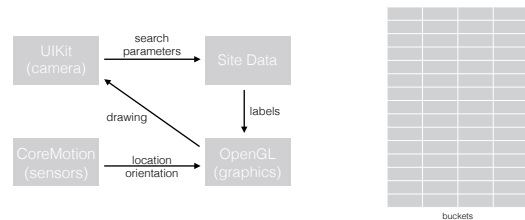
- Spatial Orientation
 - All Sites
- Turn-to-Turn Navigation
 - Selected Site



45

Augmented Reality - II

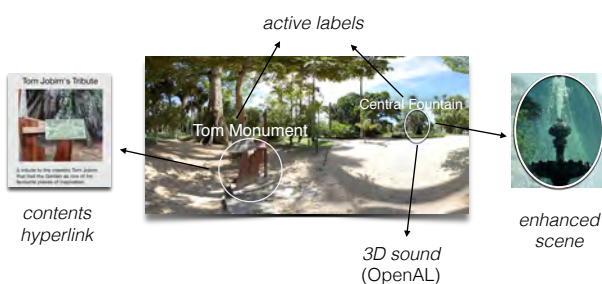
- Software Architecture
- Labels on Screen



46

360° Panoramas - I

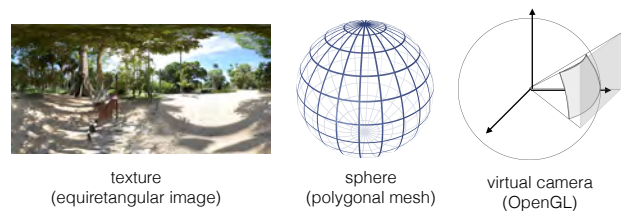
- Interactive Augmented Reality



47

360° Panoramas - II

- Representation and Rendering



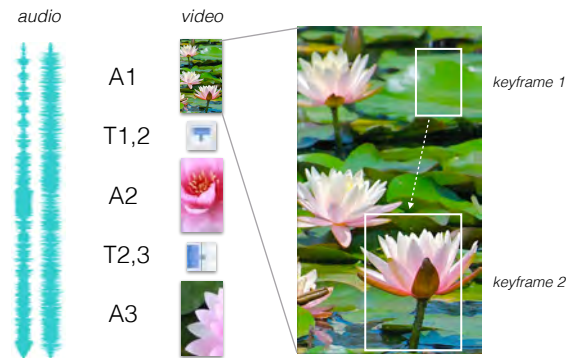
48

Animation - I

- “Uber Media” Engine
 - Sequence of Image Based Animations (Ken Burn’s Effect)
 - Transition Between Animations
 - Synchronized Audio
- Simple Authoring Language
 - Key-Frame based

49

Animation - II (example)



50

Future Directions

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

51

Expo Framework

52



53

Architecture

- Micro-Location
 - iBeacons
- Content
 - WiFi (Streaming)
- Authoring
 - State Machine

54

iBeacons

- Region Monitoring
 - Notifications (enter and exit Exhibit)
- Beacon Ranging
 - Proximity (Expo Areas)

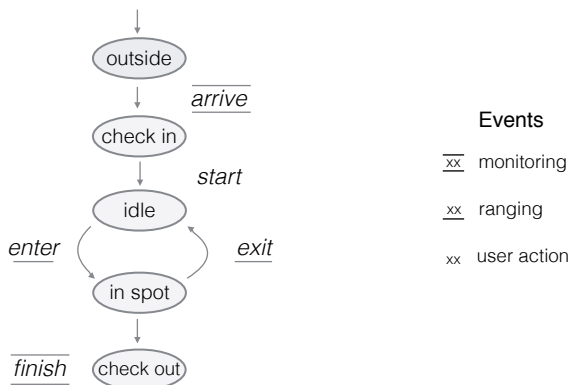
55

Expo Flow

- Approach : *Welcome*
- Entrance : *Book Signing*
- Idle : *Browse, etc*
- Areas : *Content-Dependent Interaction*
- Exit : *Send Info*

56

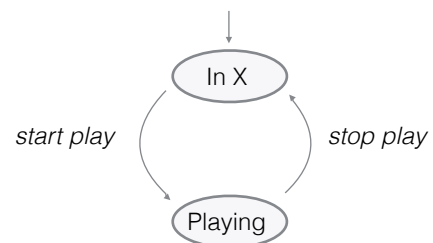
Exhibit State Machine



57

Area State Machine

(example - play content)



58

Expo Data Model

- User
 - name
 - email
 - visits [*]
 - items [*]
- Visit
 - date
 - duration
 - spots [*]
- Spots
 - name
 - time in
 - duration
 - visit *
- Items
 - name
 - contents
 - etc ...

59



60