



Beyond The Desktop

The Mac in Data Acquisition and Analysis

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Background

- Tandy Color Computer (CoCo)
- OS-9 Real-Time Operating System
 - Embedded/Control Systems
 - Philips CD-i
 - DAVID Interactive Television Software
- In 2002, I saw the light and moved to OS X





Clarification

CoCo != Cocoa

OS-9 RTOS != Mac OS 9





Presentation Goals

- Define data acquisition & analysis
- Survey consumer and industrial applications
- Identify the potential for the Mac and iOS
- Examine challenges and opportunities





Define: Data Acquisition

- Collection of data representing real world, measurable properties
 - Velocity, Temperature, Pressure, Flow Rates
- Specialized sensors sample the data
- Embedded device or computer collects the data





Define: Data Analysis

- Collected data has little intrinsic value
- Analysis brings the value to the data
 - Predictive value
 - Referential value
- Modeling: plots, graphs, spreadsheets





A Survey of Applications

- Consumer
 - Automotive
 - Home Automation/Security
 - Energy & Weather Monitoring
- Enterprise & Industry
 - Medical/Healthcare
 - Financial
 - Raw Materials Production





Consumers





The iCar

What if your Mac or iPhone could communicate with your vehicle to:

- Calculate Fuel Economy
- Maintenance Reminders
 - Change your Oil, filters, etc.
- Anticipate Component Failures





The iHome

Imagine your Mac being the centerpiece of a home automation system that performs:

- Security and Home Control
- Energy Monitoring
- Video Surveillance
- Weather Reporting





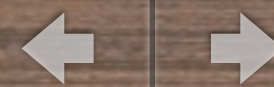
Demo



SecuritySpy (Video Surveillance)



WeatherSnoop (Weather)



Industry





It's a Windows World



Vs.





iHealth

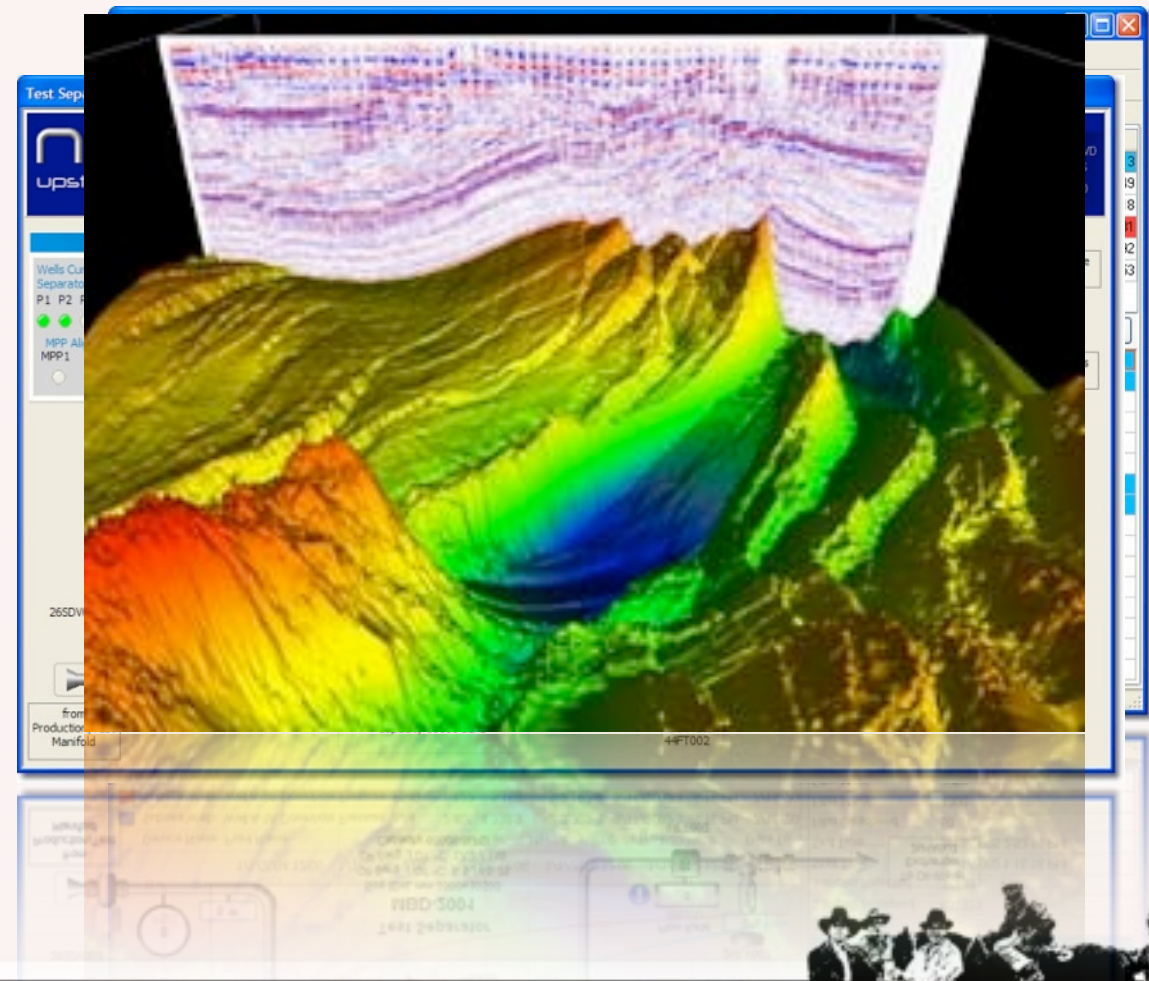
- What if your iOS device could monitor:
 - Blood Pressure
 - Glucose Levels
 - Heart rate and rhythm
- Then graph the data and send the results to your doctor





iEnergy

- Oil Exploration and Production (E&P)
 - 3D Seismic
 - Trend Analysis
 - Asset Management





Where Do We Go From Here?





Technical Considerations

- Protocols and interfaces are unique
 - CANbus - Standard for vehicles
 - Modbus - Standard for control devices
 - X10 - Protocol for home automation
- Hardware can be different (even legacy)
 - Ethernet, Serial
 - Digital I/O





Development

- Target a market
- Obtain protocol specifications
- Look for existing implementations
- If it doesn't exist, write it!





Challenges

- PC form factors are configurable
 - Embeddable
 - Designed for harsh environments
 - Intrinsically safe
- Apple's control





What the Mac Brings

- Reliability
 - BSD Unix Foundation
 - Virus Free
- A Philosophy of Simplicity and “Just Works”
- New Interface Technologies such as Multi-Touch





Apple and Business

“We haven't been pushing it with businesses, but they're tearing it out of our hands. We've got a tiger by the tail.” - Steve Jobs





Opportunity Abounds

- Companies are ripe for change
- Driven in large part by awareness of iOS, stability of Mac OS X, Apple's ascendancy
- Next 5 years should be interesting





Q&A

