



# Design and Implementation of Application Suite for Motorola Wireless Handheld Barcode Scanner

George Brown College  
Computer Systems  
Technology  
Field Placement

# Group Members

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# About the Project





# George Brown College Field Placement

- Students participate in a field placement as part of their final year in Computer Systems Technology
- Eight students were selected by the college to complete a project for Motorola
- Timeframe of one semester: January to April, 2008

# Motorola Handheld Wireless Barcode Scanner

- Portable, battery-powered handheld device
- Uses Windows Mobile or Windows CE operating system
- Touch screen and keyboard for user input
- Communicates using Wi-Fi or cellular technology



# Project Intent

- Motorola needed an application suite to demonstrate the handheld's capabilities to potential customers
- The suite would demonstrate the capabilities in several different fields: health care, field service, warehousing, etc.

# Application Requirements

- Lightweight, easy to use handheld interface
- Wireless connection to a central database server
- Simple administration of the server
- Customizable content to match the potential client (ie. logos, product listings)





# About Wireless Networking

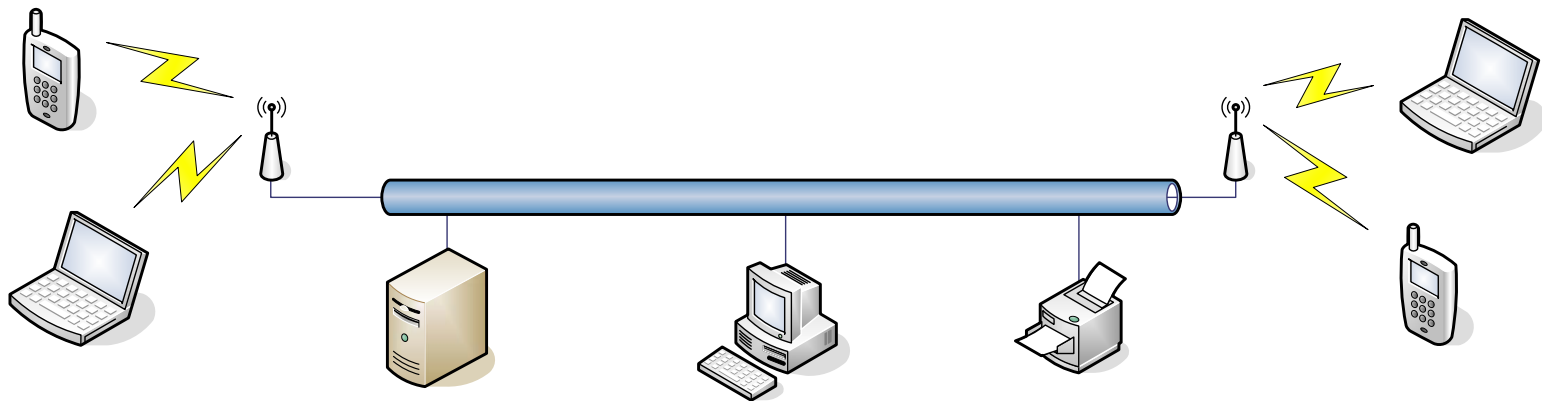


## IEEE 802.11b

- The world standard for local-area wireless networking
- Also known as “Wi-Fi” or “Wireless-B”
- Maximum speed of 11 megabytes per second: faster than household broadband Internet access
- Slower than 802.11g, but less expensive

# Wireless Access Points

- An access point (AP) allows wireless devices to access a conventional wired network
- Wireless range is limited, so multiple APs can provide increased coverage



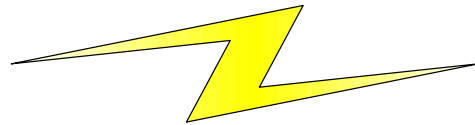
# WS2000 Wireless Switch

- Provided by Motorola for the project
- Can easily interconnect wired networks with wireless networks
- A wireless antenna is connected to the switch to turn it into an 802.11b access point



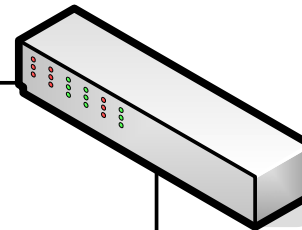
# Project Connectivity Diagram

Handheld

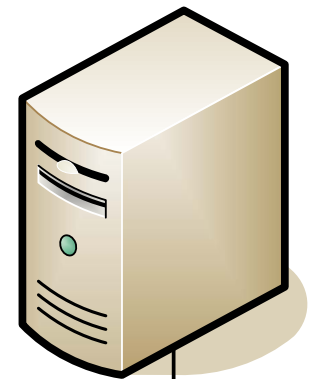


802.11b  
Antenna

WS2000  
Wireless Switch



Central Database  
Server



# Synchronization

- The handheld does not need a constant, uninterrupted wireless connection. It holds a complete copy of the server's database
- When data on the handheld has changed, it can connect to the server and exchange the new data. This is called "synchronization"
- During this, the handheld also obtains new data which has changed on the server
- Synchronization should occur often to prevent data from growing old and obsolete

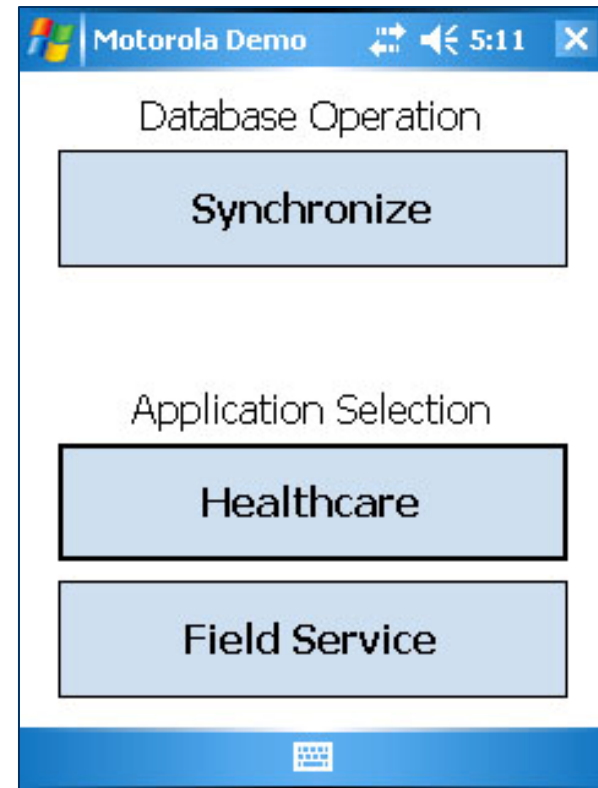


# Application Demonstration



# Application Demonstration

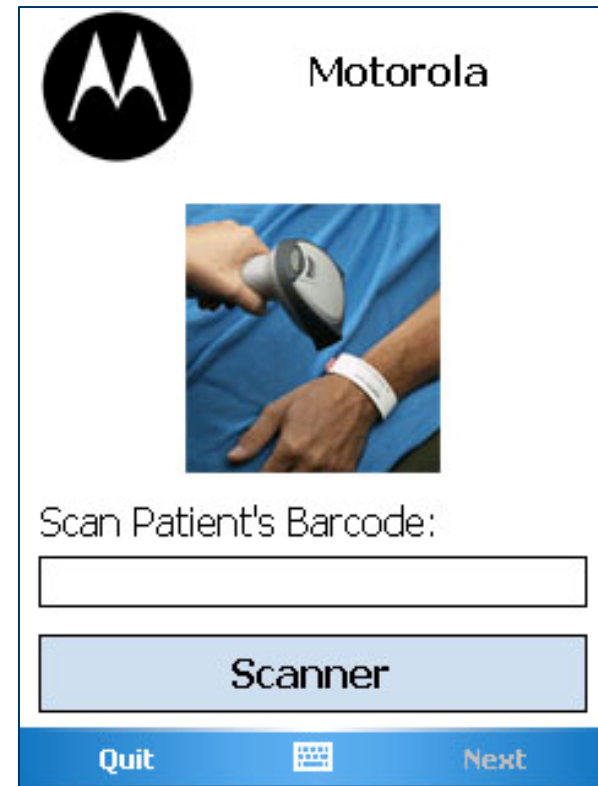
- The program is used by pressing on the touch screen with a finger or stylus
- You can synchronize the handheld with the server, and then select a field to simulate on the handheld





## Application Demonstration (cont'd)

- The Health Care application simulates the administration of drugs to a patient
- You start by scanning the barcode on a patient's wristband (using the scan button on the handheld)



# Application Demonstration

- If the barcode matches a patient's entry in the database, her information is displayed for verification
- The required drug is also listed
- You must scan the drug to ensure you are administering the right one



Motorola



Patient:  
Jane Doe

ID: 12345

**This patient needs**  
Some Drug (500mg)

Scan Drug's Barcode:

Scanner

Back  Next

The form displays patient information for Jane Doe, ID 12345, and indicates that she needs "Some Drug (500mg)". It includes a text input field for scanning the drug's barcode and a "Scanner" button. At the bottom, there are "Back" and "Next" navigation options with a keyboard icon in between.

# Application Demonstration

- After scanning the correct drug, you can administer it to the patient.
- When you press Next, the application saves the date and time to add to the patient's drug administration record



Motorola



**Administer Some Drug (500mg) to patient. Press Next when finished**

*Last Administered  
3/25/08 2:31:40 PM*

**Drug ID: 12345**

Back  Next

The screenshot shows a mobile application interface for drug administration. At the top left is the Motorola logo. To its right is the text "Motorola". Below the logo is a photograph of a hand pouring red liquid from a bottle into a small white cup. Underneath the photo is the instruction "Administer Some Drug (500mg) to patient. Press Next when finished" in bold black text. Below that, the text "Last Administered 3/25/08 2:31:40 PM" is displayed in red, italicized font. At the bottom, the text "Drug ID: 12345" is shown in bold black. The bottom of the screen features a blue bar with the words "Back" and "Next" in white, with a keyboard icon between them.

# Application Demonstration

- Once completed, you can Start Over to scan the next patient
- You are reminded to synchronize the handheld to keep the central server up-to-date



Motorola



Completed!

Please sync with main database at earliest convenience.

Back



Start Over

## Conclusion

- The project was completed successfully, providing Motorola with a basic suite of applications to demonstrate the handheld's capabilities
- Those capabilities include wireless networking, demonstrated by the use of a central database server

## Conclusion (cont'd)

- The WS2000 wireless switch made it easy to communicate between the Motorola handheld and the database server
- This project demonstrates how a basic collection of technologies can be used to create a large-scale application for use in many different fields