Secure Traveler

Preliminary Design Review
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The Team

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The Problem

- We forget things, lose things, divide our limited attention, and make choices we later regret.
- Traveling tourists are prime suspects for theft.
  - 33% of travel insurance claims are for lost/stolen possessions.
  - Each day an estimated 400,000 pickpocket incidents occur around the world.
- Our antiquated methods need to be improved as size decreases and price increases.
  - Retracing your steps
  - Asking others and security
  - Assuming you forgot to bring it
  - Hoping for a good samaritan to find it
Statistics on the Problem

- Lost items cost Americans $5,591
- The average American wastes 55 minutes a day looking for things they own but can’t find.
- Average Americans spends two years of their life looking for lost or misplaced items.
Effects of the Problem on Individuals

- Time Loss: Time is the most valuable resource. Why use it inefficiently?
- Memory Overload: Extra Stress when sleeping and during the morning from an Age old issue
- Price: We could all use a personal secretary for daily life but the budget has cobwebs
Calm down and Relax

- Extra safety in public allowing greater focus on work or important tasks
- Stop writing lists that you have to check everytime you leave the house
- Have more information when making decisions on lost items
- A friend to find items that are lost
Requirements Analysis: Specifications

- Effective communication range between device and phone of less than 100m
- Communicate device position with server
- Periodic location updates
- Respond in under two seconds
- Small and lightweight
Requirements Analysis: Inputs and Outputs

- **Inputs**
  - Device/Phone
    - Bluetooth

- **Outputs**
  - Smartphone
    - Location
    - Push notification
  - Device
    - Sound
Design Alternatives

- **StuffTracker**
  - RFID
    - ItemID, ItemName, Location
  - Database
    - Microsoft Access
  - PC/smartphone
    - Google Maps
      - Last known location

- **Beepachu**
  - Transmitter/Receiver
    - Hot/cold
Our Solution

- Secure Traveler
  - Device
  - Smartphone
    - Application
  - Database
    - Amazon Web Services
- PCB
  - GPS
  - Bluetooth
  - Power
  - Audio/LEDs
  - WiFi (Security alternative)
Block Diagram

Device
- Power Supply
- Speaker/LEDs
- GPS Receiver
- Bluetooth Transceiver

User’s Smartphone
- Application

Other Smartphone
- Application

Database
- AWS
Device

- Power Supply
- Speaker/LEDs
- GPS Receiver
- Bluetooth Transceiver

User's Smartphone
  - Application

Other Smartphone
  - Application

Database
  - AWS
Device

- **GPS Receiver**
  - Requirements
    - Accurate
    - Low power

- **Bluetooth Transceiver**
  - Requirements
    - Reliable
  - Implementation
    - Bluetooth
      - Range < 100m
      - Low power

- **Speaker/LEDs**
  - Requirements
    - Low power

- **Power**
  - Requirements
    - 5 V
Smartphone

- Device
  - Power Supply
  - Speaker/LEDs
  - GPS Receiver
  - Bluetooth Transceiver

- User’s Smartphone
  - Application

- Other Smartphone
  - Application

- Database
  - AWS
Smartphone

- **Application**
  - Send device coordinates to server
  - Social Networking capabilities for lost devices
  - Google Maps API
    - Determine device location
- **User Interface**
  - Display device location
  - Enable/Disable device speaker
  - Push Notifications
    - Reminders
- **Settings**
  - Enable/Disable push notifications
    - Set distance
Database

▪ **AWS**
  - Store/manage data
    - Location
    - User Profile
    - Settings
  - Requirements
    - Fast, reliable, and secure
  - Implementation
    - Swift 3.0 and/or Java
Block Diagram: WiFi Alternative
Expansion

- Diversifying the device
  - A lightweight version with cheaper parts
  - A higher power, higher accuracy device
  - A more impact resistant version

- Security Features
  - Wifi features to expand the range for locating devices
  - Communication features with other users
  - Alert authorities upon being reported as missing/stolen
  - High end version with camera for added security
Moral Implications

- **Security**
  - The connection if not secure would allow other users or hackers to access item or user locations.
  - The connection if able to be hijacked could result in audio being used against the user.

- **Trust**
  - An option for fast location of stolen devices could rely on other users.
  - Another option is to connect stolen devices to security forces through a higher level authentication.
Proposed MDR Deliverables

- Demonstration of communication between device and application via Bluetooth
- Demonstration of location data storage
- Demonstration of Google Maps integration for displaying location data retrieved from server
Individual Responsibilities

- **James McNaney**
  - Power Management + Board Layout

- **Manjot Chahal**
  - Server Management + Communication

- **Cameron Adams**
  - Audio Communication + User Interface

- **Sam Tang**
  - Application Design + Team Coordinator
Gantt Chart
Questions?