MICHIGAN STATE UNIVERSITY

Project Plan
Product Availability Check using Glassware

The Capstone Experience

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From Students…
    …to Professionals

Functional Specifications

- Enable multi-tasking on sales floor
  - Provide faster, more efficient customer service
- Real-time barcode scanning using Glass
  - Easily check item availability
- Scan images for barcodes using Android device
  - Save images using Glass
  - Creates uninterrupted workflow
- Provide analytics on item status and usage

Design Specifications

- Glass Application
  - Scan barcode
  - Display product information on cards
  - Take photo using voice command or physical gestures
- Android Application
  - Pick a photo from Gallery to scan for barcode
  - Display product information
  - Display recently search result with option to refresh the information
- Web Interface for Analytics
  - Search for products and filter the results
  - Display results in table and graph

Screen Mockup: Glass Application

Real-time scanning

Card displaying product info

Screen Mockup: Mobile Application

Image loaded &
ready to be analyzed
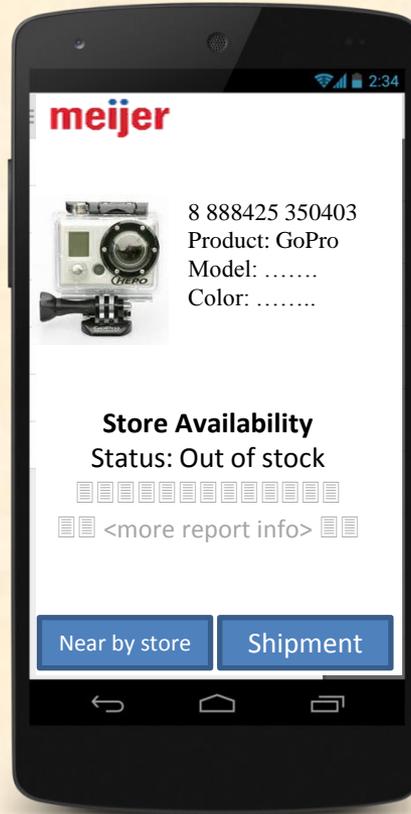
Product info screen
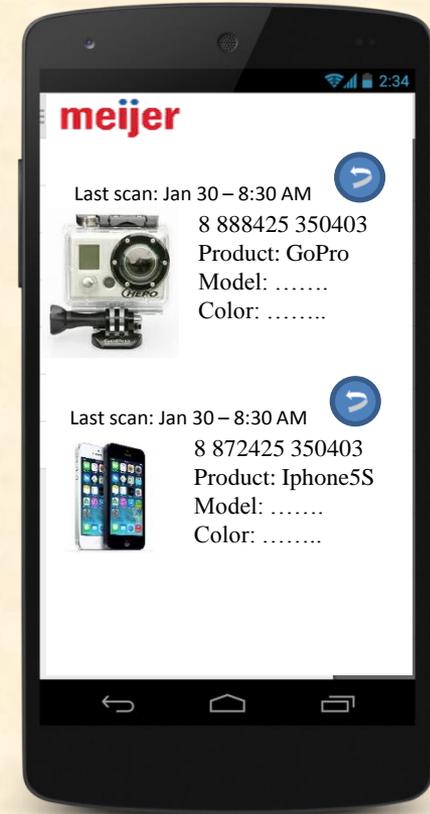
Recently viewed
scan results

Screen Mockup: Website

ASP.NET Framework

Search Functionality

Screen Mockup: Website

Product Availability Data
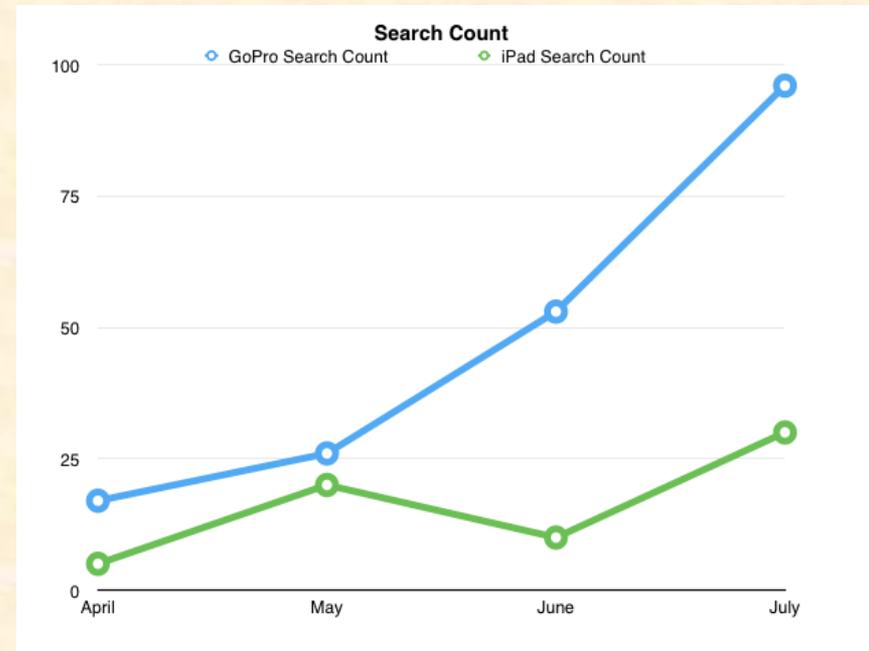
Product Search Count Comparison

Technical Specifications

- Glass can scan or take pictures of barcodes
- BarcodeEye used for scans, Mirror API call sends UPC to Azure
- SQL Server retrieves product information
- Product info sent back to Glass via Mirror API
- Glass pictures are sent to an Android Device
- App analyzes images of barcodes using ZBAR
- Microsoft Mobile Services used for back end communication with Azure from Android App

System Architecture

Google Cloud

Windows Azure

SQL

.NET

Google Glass

Mirror API

GDK

Mobile Services

Android App
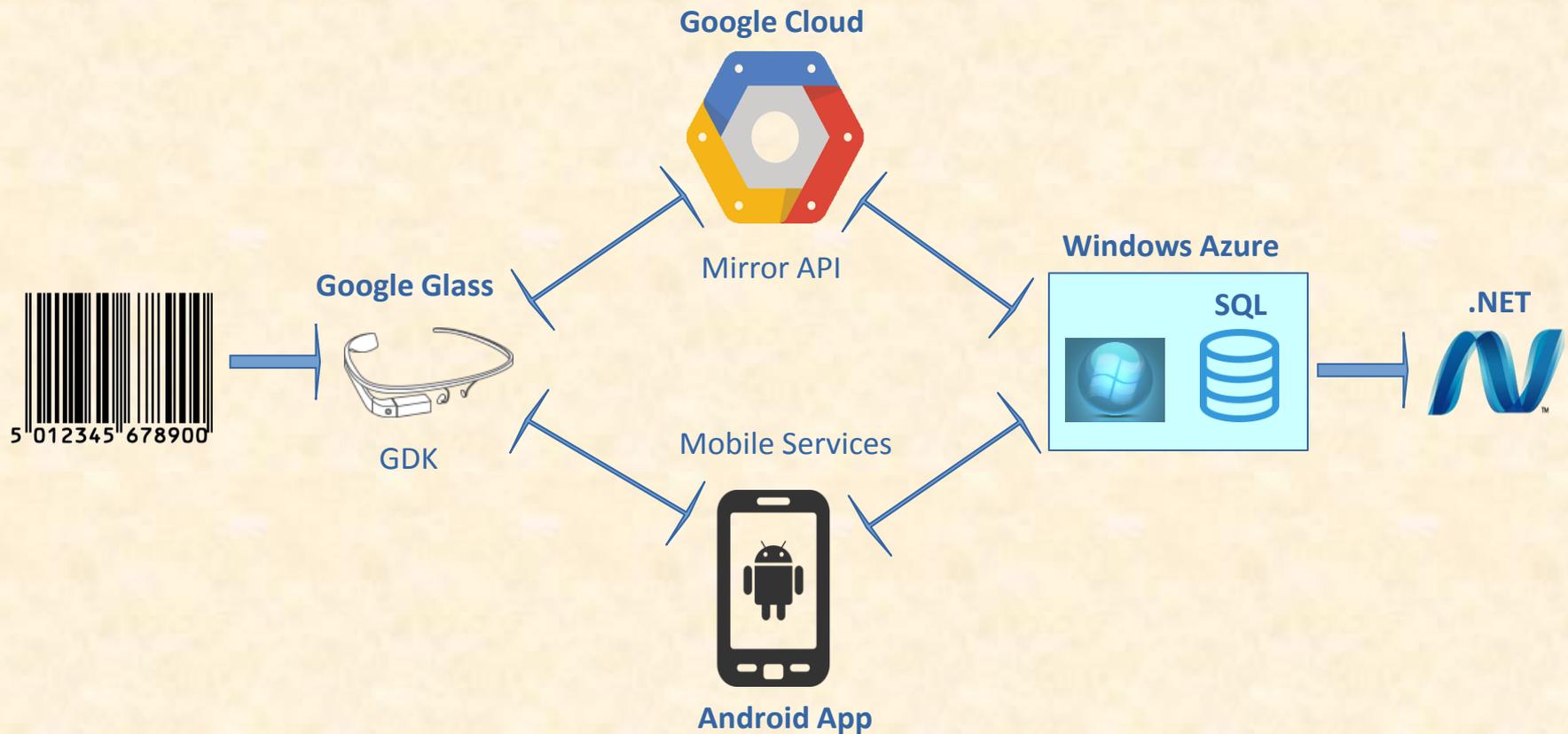
System Components

- Hardware Platforms
  - Google Glass
  - Android device 4.0.3+
- Software Platforms / Technologies
  - Android Studio
  - Visual Studio
  - Windows Azure and ASP.NET
  - Microsoft Mobile Services
  - ZBAR
  - BarcodeEye

Testing

- Physical testing in engineering building
- Android Studio
  - Glass and Android applications
- Visual Studio
  - Web application
- Microsoft Azure
  - SQL server with mock data

Risks

- **Google Glass Software Development Kit (GDK)**
  - No prior experience developing for Glass.
  - Mitigation: Research and early testing.
- **Mirror API**
  - Server side API that the team has not worked with before.
  - Mitigation: Research and early testing.
- **Microsoft Azure Mobile Services**
  - Azure not managed locally, no control over physical server. No prior experience with Azure Mobile Services.
  - Mitigation: Research and interact with Azure via Glass and Android to explore capabilities and limitations.
- **Android Studio**
  - The team's prior experience is limited.
  - Mitigation: Apply previous experience on Android app development using Eclipse.
- **Testing Environment**
  - Testing requires physical set up in order to test barcode scanning for Glass. Need to simulate a store environment.
  - Mitigation: Interact with Meijer team to inquire about the best methods to simulate as real of an environment as possible.