

MICHIGAN STATE

U N I V E R S I T Y

Project Plan

Product Availability Check using Glassware

The Capstone Experience

Team Meijer

Ethan Ettema

Jim Howell

Scott Rucinski

Luan Tran

Department of Computer Science and Engineering
Michigan State University

Spring 2015



*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

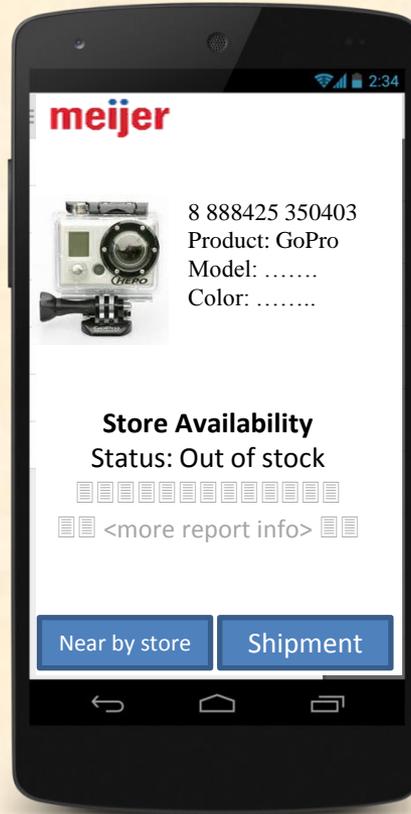


Card displaying product info

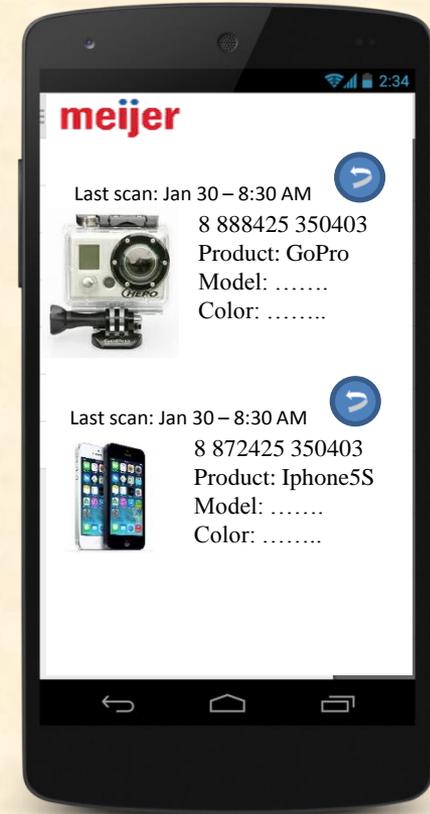
Screen Mockup: Mobile Application



Image loaded & ready to be analyzed



Product info screen



Recently viewed scan results



Screen Mockup: Website

ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS, and JavaScript.

[Learn more »](#)

Getting started

ASP.NET Web Forms lets you build dynamic websites using a familiar drag-and-drop, event-driven model. A design surface and hundreds of controls and components let you rapidly build sophisticated, powerful UI-driven sites with data access.

[Learn more »](#)

Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

[Learn more »](#)

Web Hosting

You can easily find a web hosting company that offers the right mix of features and price for your applications.

[Learn more »](#)

ASP.NET Framework

Search For:

Filter Results by:



Date:

Before



Location:



In-Store Availability

Other Options...

Search Functionality



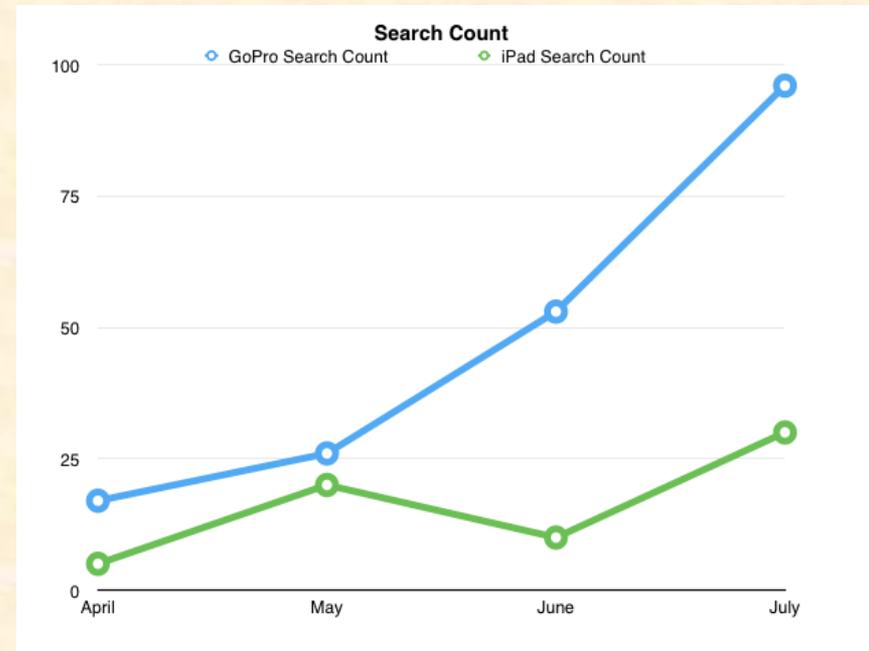
Screen Mockup: Website

Order by: ▼

GoPro Searches

Date	Location	In-Store Availability	Other Data...
1-20-15	East Lansing		5
1-20-15	East Lansing		4
1-21-15	Okemos		4
1-22-15	East Lansing		3

Product Availability Data



Product Search Count Comparison

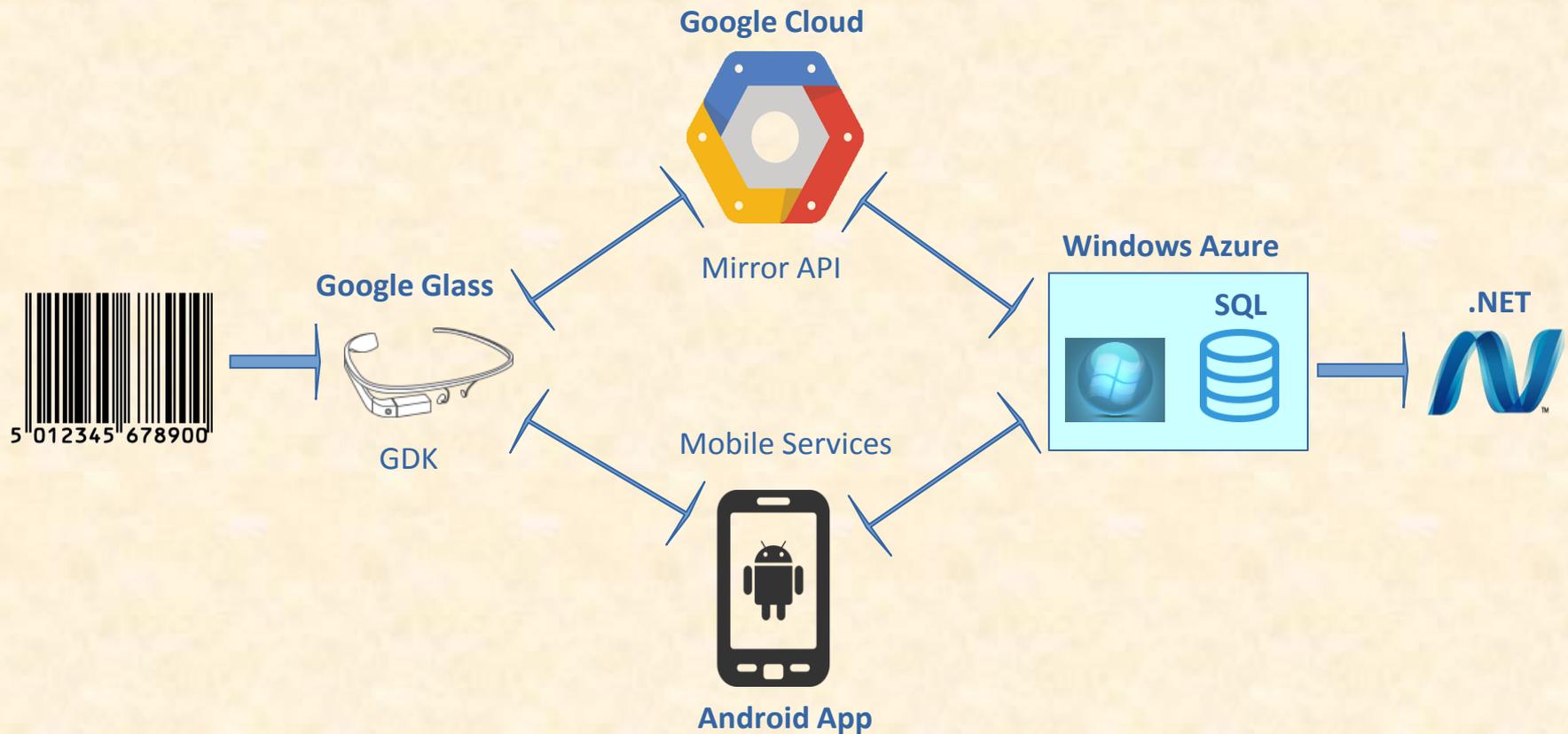


Technical Specifications

- 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



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.

