MICHIGAN STATE
U N I V E R S I T Y

Project Plan
Tablet-Based Point-of-Sale System

The Capstone Experience

Team Meijer

Andrew Rockwell
Peter Rifle
Riti Adhi
Mark Sun

Department of Computer Science and Engineering
Michigan State University

Fall 2011

From Students…
…to Professionals

Project Overview

- Self check out system for tablets

- Interfacing with UPC Barcode Scanners

- Interfacing with Meijer's Point-of-Sale sub system
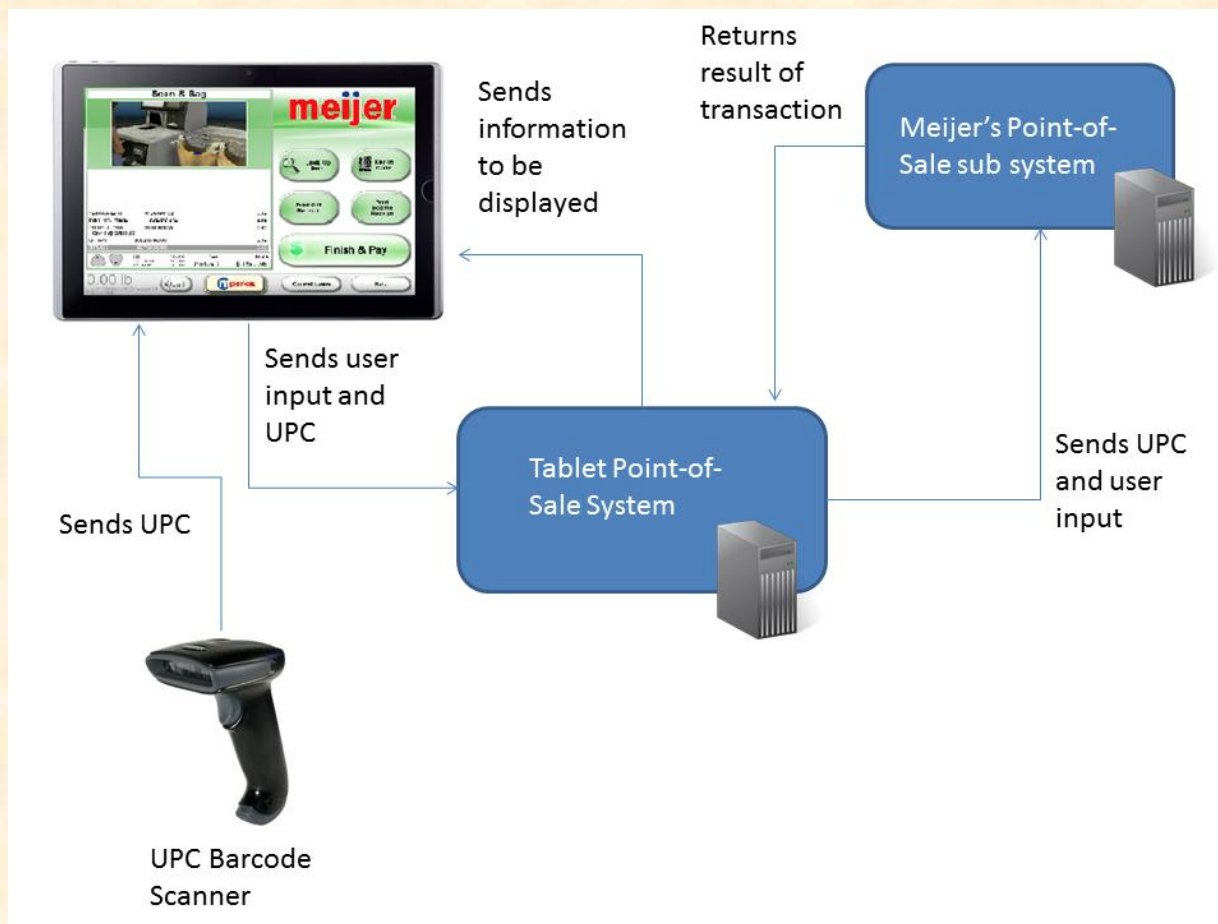
Functional Specifications

Figure 1.1. System Diagram
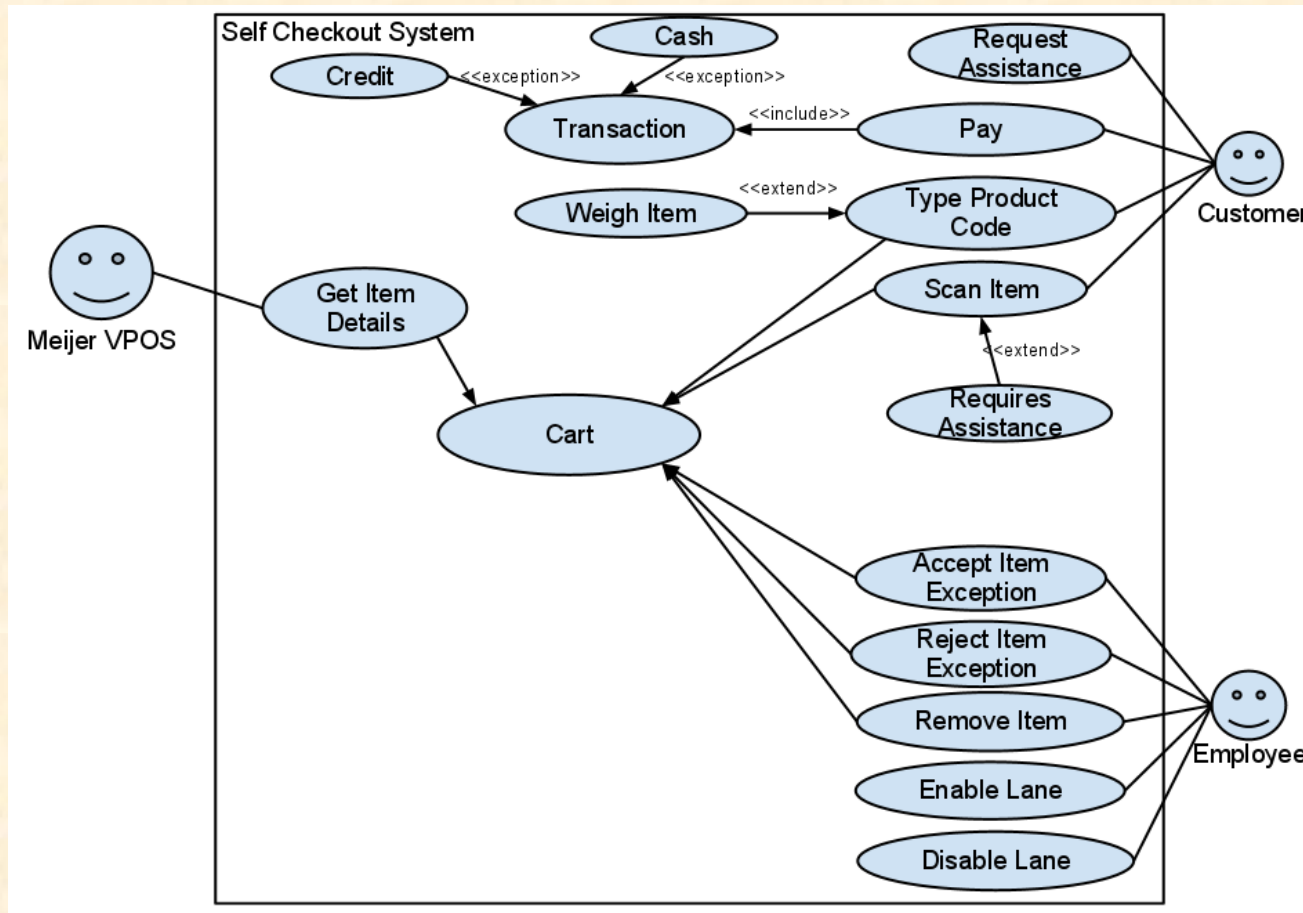
Design Specifications

Figure 1.2. Use Case Diagram

Screen Mockups

Figure 2.1 Start Screen

Figure 2.2 Main Screen

Screen Mockups

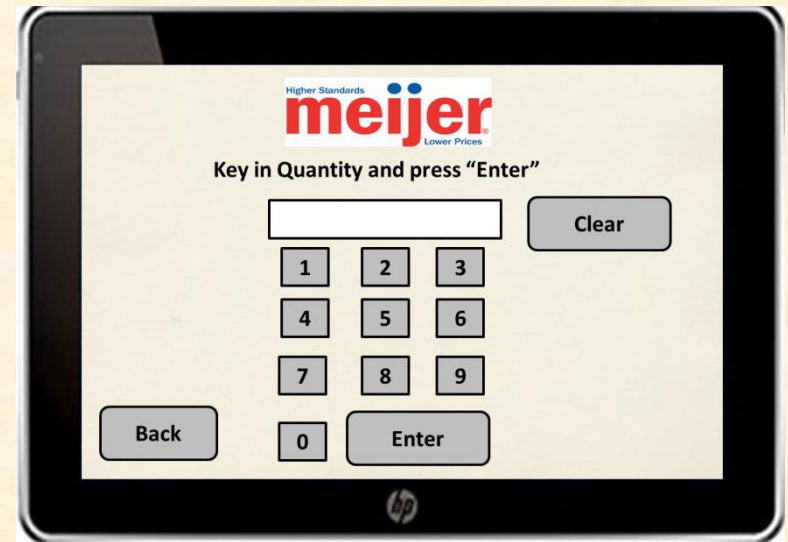Figure 2.3 Product Code Input Screen

Figure 2.4 Product Quantity Input Screen

Screen Mockups

Figure 2.5 Product Look Up Screen

Figure 2.6 mPerks Screen

Technical Specifications

- Tablet will have HTML 5 UI
- .NET web service communicating via SOAP 1.1 with the existing VPOS system
    - Data as XML will be sent/received as well as decoded by our system.
- .NET interface for barcode scanners
    - Support for handheld and fixed mount scanners via USB and RS-232.
- Web service is a .NET MVC 3 web application running inside of IIS 7 on Windows Server 2008 R2.
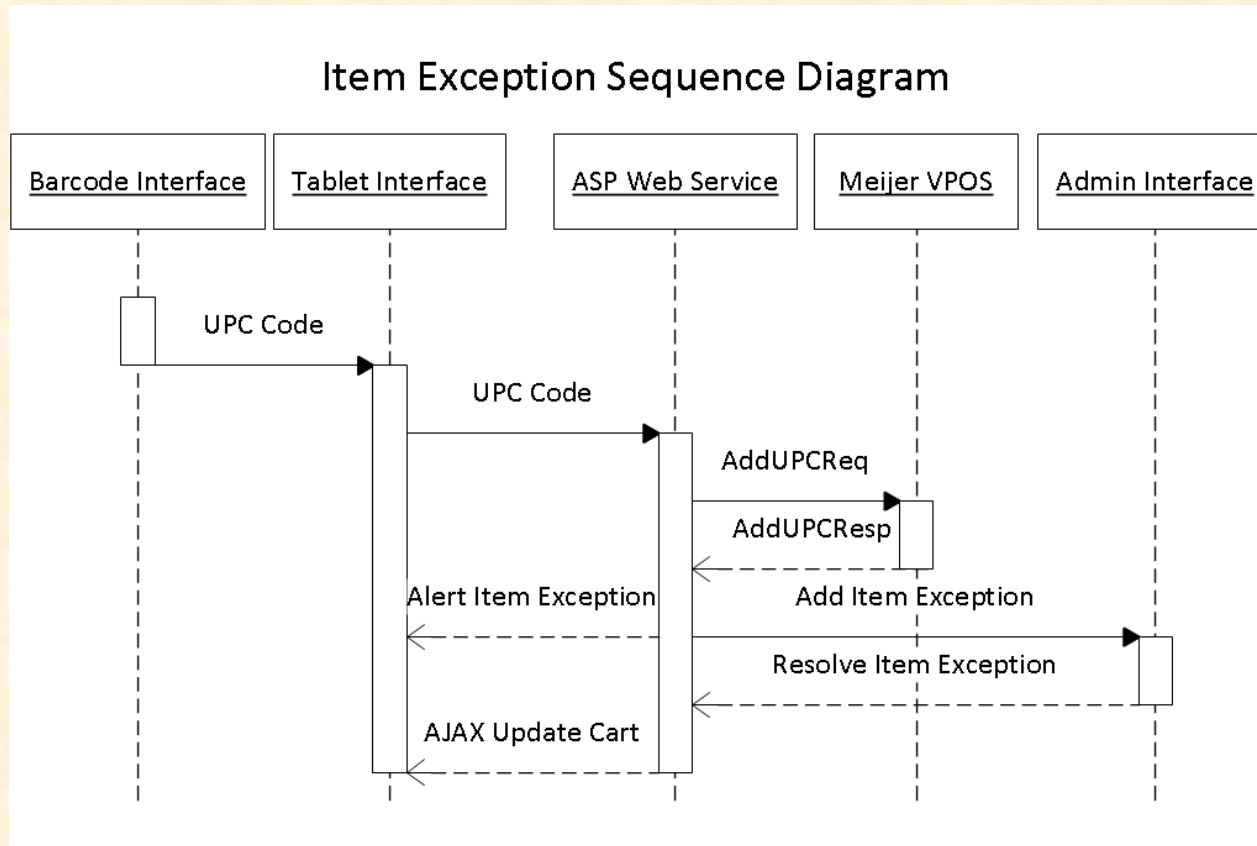
Technical Specifications

Figure 3.1. Item Exception Sequence Diagram

System Architecture

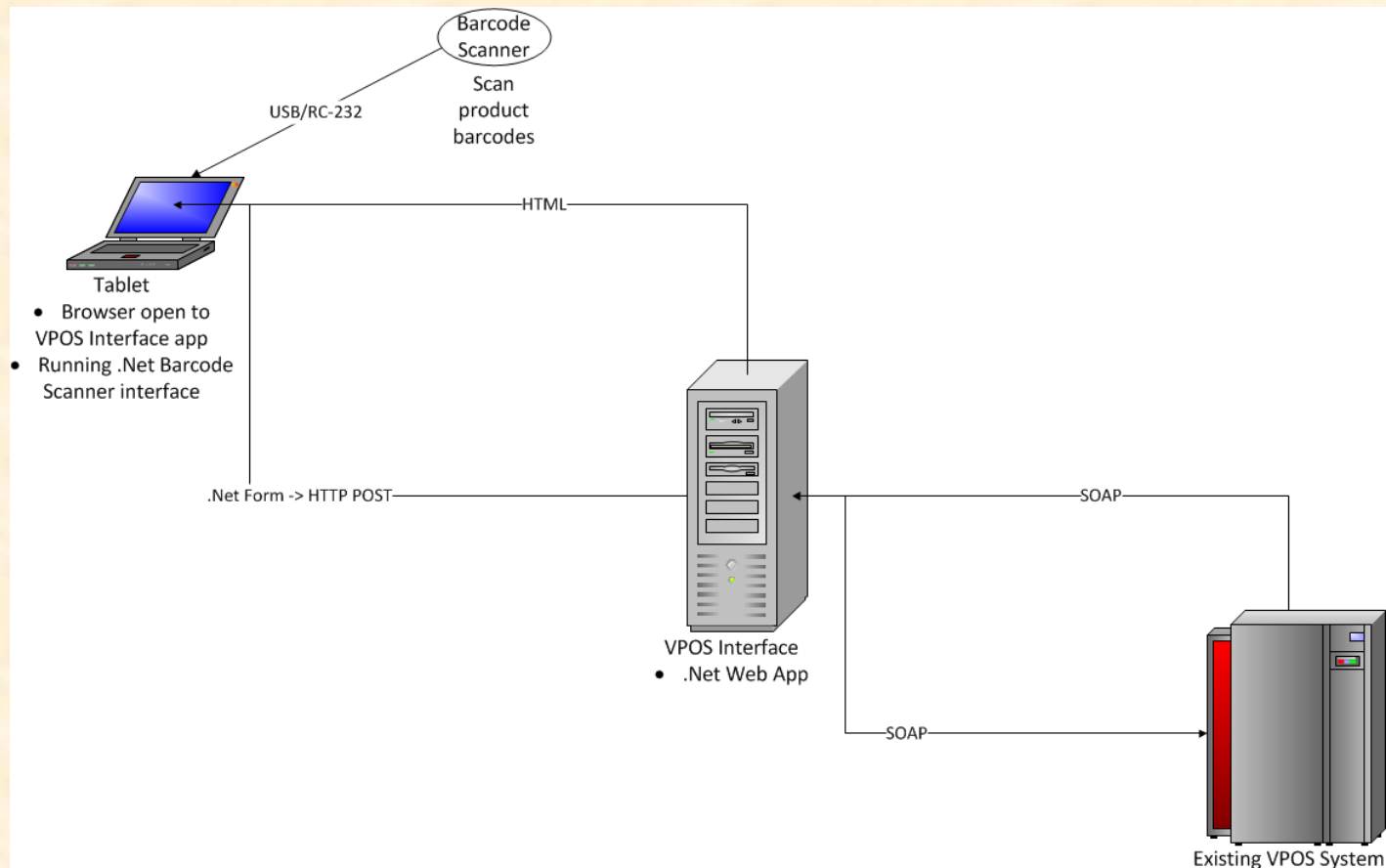Figure 3.2. System Architecture

System Components

- Hardware Platforms
  - Asus EEE Slate EP121
  - USB and RS-232 Barcode Scanners
- Software Platforms / Technologies
  - Microsoft .NET – MVC 3, C# 4
  - SOAP (XML over HTTP)
  - HTML 5, CSS 3

Testing

- Testing will be done continuously throughout development cycle

- Barcode scanner interface will be tested with all scanners specified by Meijer

- Web application and barcode scanner interface will be unit tested

- Automated UI testing will be implemented for web app UI

Risks

- Completely New UI
  - Many components are likely to be re-used, but we'll need to talk to admin users to determine priority use cases so the UI makes the most sense.
  - Mitigation: Take a trip out to Meijer labs as soon as possible, ask for access to talk to employees to determined admin uses.
  - Status: Trip to Meijer labs scheduled for 9/23.
- Browser v. Native App
  - Native app would require more development, but browser would likely create a worse user experience
  - Mitigation: Talk to client to figure out if they have a preference. If not, prototype native app.
  - Status: Native app prototyped. Need to ask client about preference still
- Interfacing with existing VPOS
  - Waiting on documentation until dev contact returns from vacation, will take some ramp up to learn it and make sure we're following Meijer coding standards for it
  - Mitigation: Ramp up .Net technologies in the mean time, ask plenty of questions when we get documentation.
  - Status: Received documentation. Web app has been prototyped. Questions have already been raised.
- Security
  - Likely will be handling payment data and will need to ensure that only the intended clients can connect to our service.
  - Mitigation: Make sure security is a priority throughout our development process.
  - Status: We will not be handling payment, which significantly lowers our security concerns. We will likely still save data in the session which we will need to verify is adequately secure.