

MICHIGAN STATE

U N I V E R S I T Y

Project Plan

Laundry Room Tablet Payment System

The Capstone Experience

Team Whirlpool

Samantha Bentzel
Alex Kambietz
Evan Swinehart
Angie Sun

Department of Computer Science and Engineering
Michigan State University

Spring 2015



*From Students...
...to Professionals*

Functional Specifications

- Display usage information for local machines
- Allows users to select and purchase cycles for specific washers and dryers
- Handles payments via credit card with consistency across machines
- Sends real-time notifications on cycle status to save users time

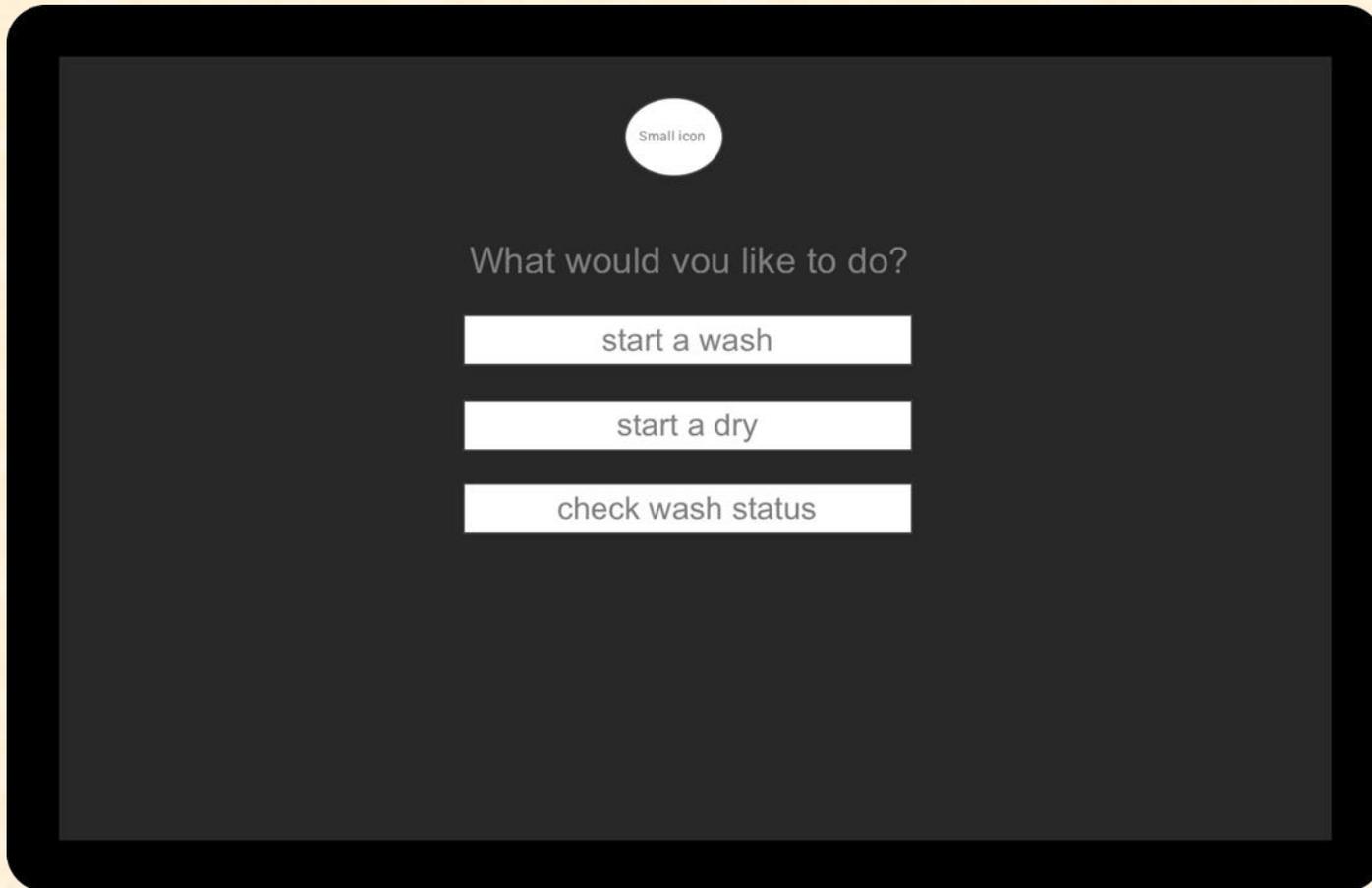


Design Specifications

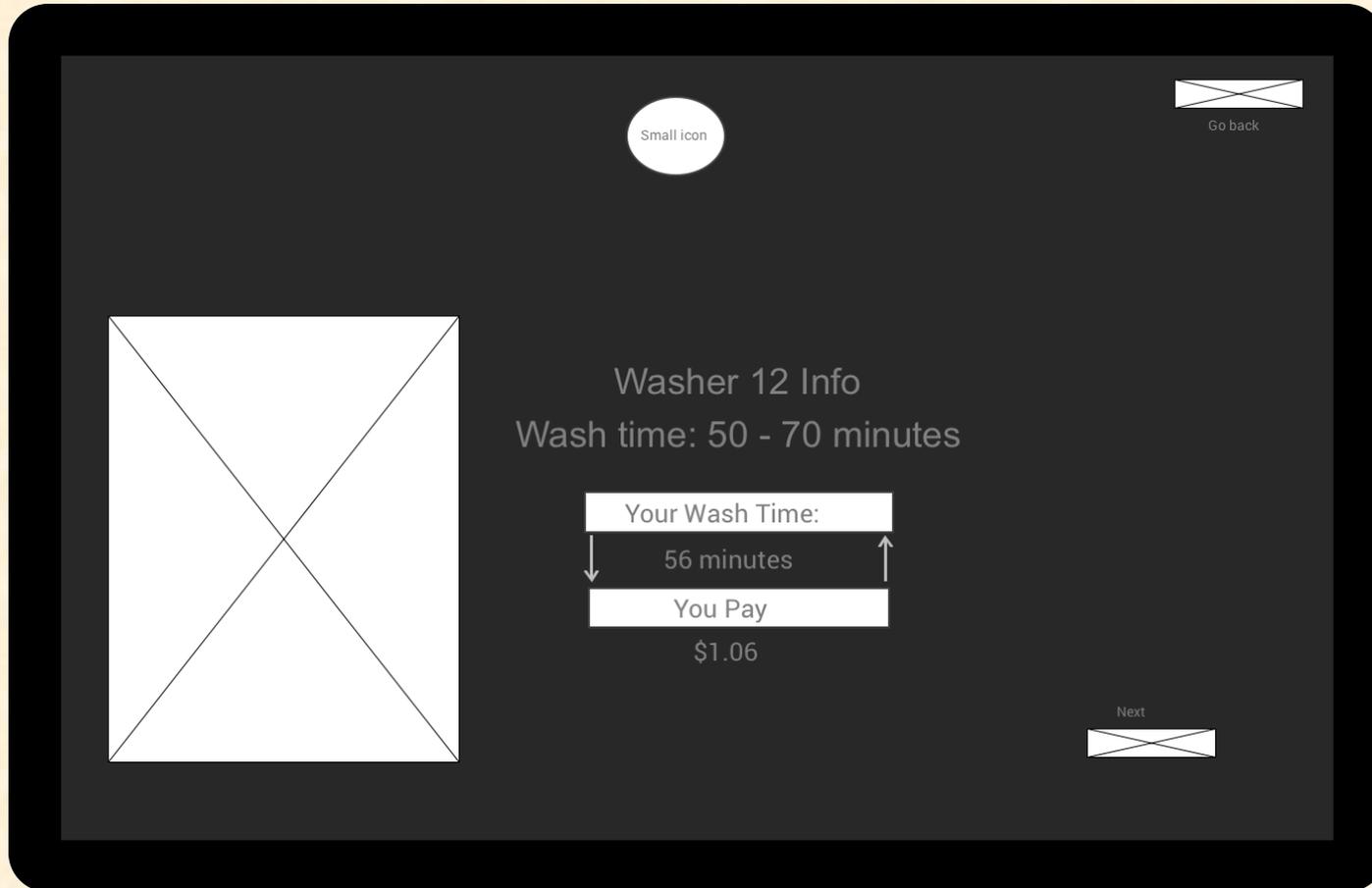
- Cross platform
- Guided washing experience for diverse audiences
- Hooks in with Innerfence
- Must complement Whirlpool's sister apps
- Must not allow app switching, allow app locking



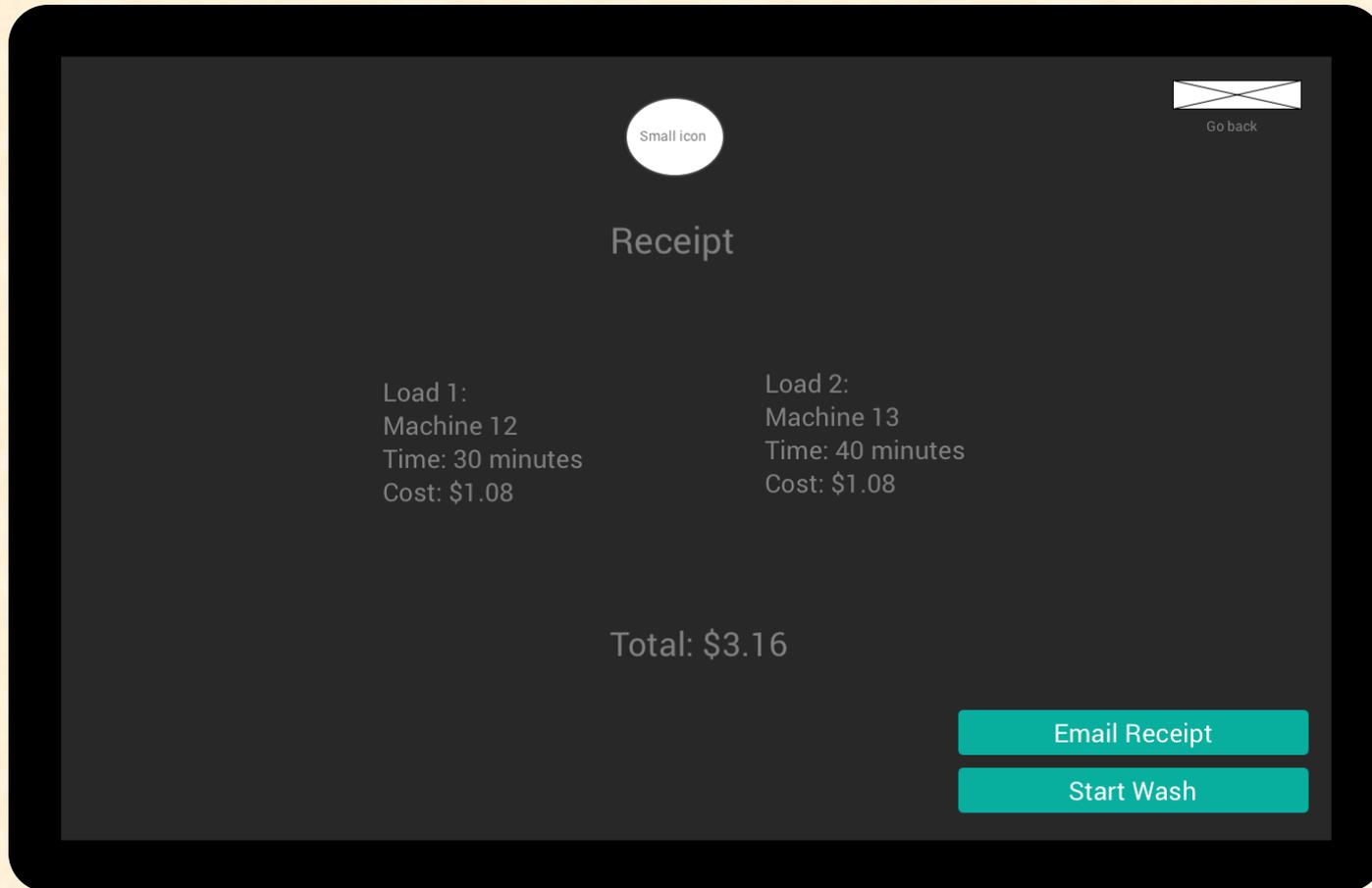
Screen Mockup: Start Page



Screen Mockup: Order details



Screen Mockup: Order Confirmation



Technical Specifications

- An application that runs on Windows, Android, and iOS tablets
 - Xamarin Shared Project
 - C#
 - REST API
 - JSON.net and RestSharp
 - Xamarin.iOS, Xamarin.Android
 - Xamarin Studio
 - XCode
 - Xamarin.Windows
 - Visual Studio



Technical Specifications

- Whirlpool API
 - Continuously query for machine updates
 - Find machines by funneling through locations and floors
 - Query price information
- Query via REST API and receive JSON response

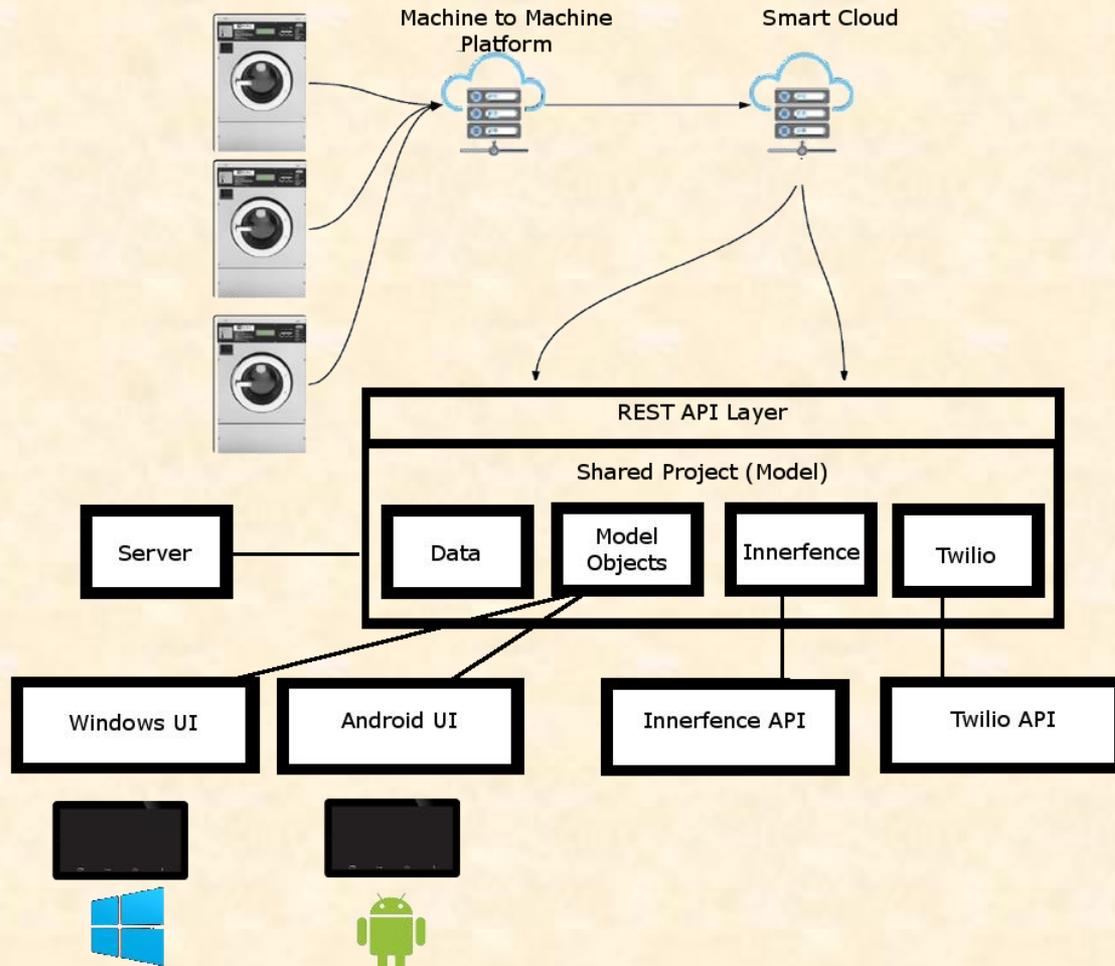


Technical Specifications

- Other
 - A MySQL database
 - Map order number to phone/contact information for notifications
 - Sending notifications
 - Emails via PHP
 - Texts via Twilio
 - A payment terminal that receives credit card information
 - Innerfence API must be platform specific
 - BitBucket



System Architecture



System Components

- Hardware Platforms
 - Whirlpool Machines
 - Tablets
 - Innerfence Payment Terminal
- Software Platforms / Technologies
 - C#
 - SQL
 - JSON
 - PHP
 - REST



Testing

- Test washer and dryer units
- Testing API tools (Postman)
- Android tablet
- Windows tablet
- Payment testing
- Special Cases



Risks

- Cross-Platform Development
 - Designing multiple applications simultaneously for different operating systems
 - Mitigation: Use Xamarin IDE to develop for multiple platforms at once
- Payment Information Security
 - Handling user's banking information implies a need for strict security
 - Mitigation: Research security measures, or make use of an established payment system with verified security protocols in place
- Backend API
 - Designing an interface between Whirlpool Smart Appliances and LRTPS could become complicated
 - Mitigation: Research and document Smart Appliance methods

