Gordon College CLAW Credit System

Jonathan Manos & Travis Pullen

GORDON COLLEGE

Link to slides: https://docs.google.com/presentation/d/1NA-tGzpuWvxxoEukCYAcM5eCtsQCLjVJAMk8Nfogy1Q/edit?usp=sharing

Our Client

- Gordon College Chapel Office
- CTS

Problem - Current Barcode System

- Current Checkers use a barcode scanner to give credit for events

Process:

1. Hand the checker your ID
2. They line up the scanner with the barcode on your ID
3. They hand you back your ID

Issues with Current System

- Checkout process takes multiple steps
  - Slow
- Upload requires wired connection
  - Tedious
- Crashes at times
  - Buggy

Solution - RFID Reader System

- Initial idea - Windows phone
  - Couldn’t find mobile RFID attachment
- Chapel Checkers have a tablet with a RFID Reader USB Device
  - Windows 10

Process:

- Tap your ID on the USB Device

Benefits with New System

- Students can tap their cards themselves
  - Quicker Checkout
- Scan always running
  - One step for Checker
- Wireless connected device
  - Easy Database Update
  - Easy Attendance Upload
- Better Technology
  - Microsoft Surface Tablet
- Cheaper Solution

Development Process

Functional Requirements

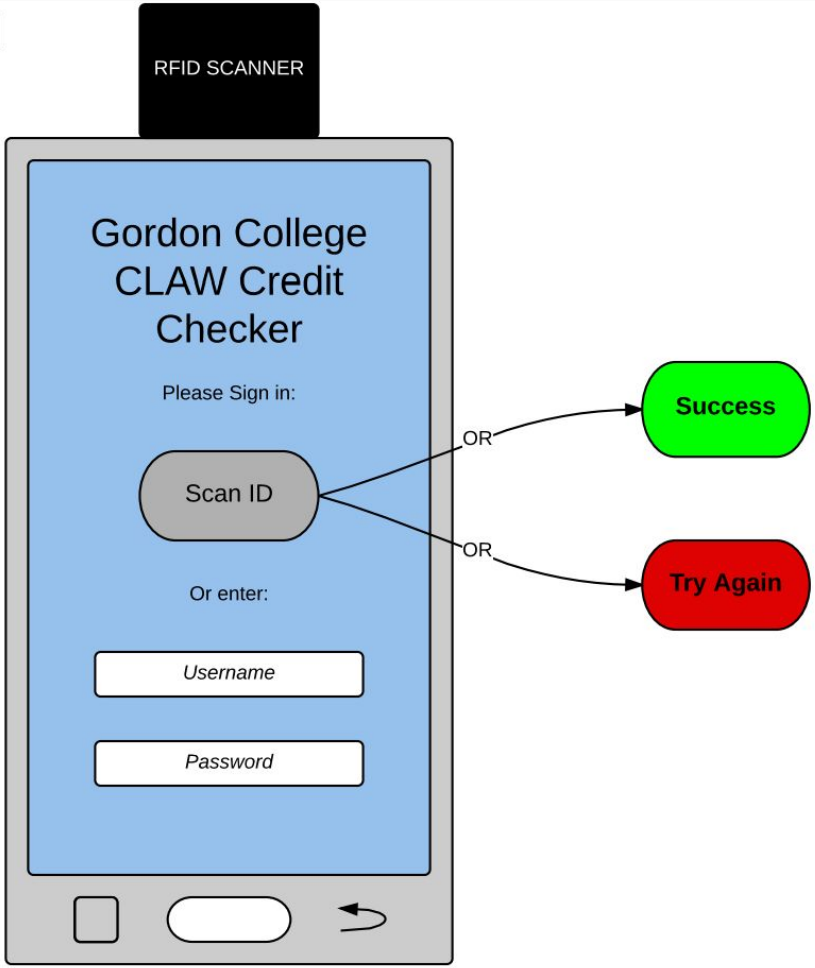
- Sign in authorized checkers
- Select events
- Scan cards
  - No-credit
- Visual/Audio confirmation
  - Green text - positive sound
  - Red text - negative sound
- Save files/data locally
- Uploading the data to Gordon servers

Non-Functional Requirements

- The color of the interface is going to be the school colors
- The user should see green text if the card was scanned
  - Red text for no-credit
- The audio confirmation will be a positive tone for a good scan
  - Negative tone for no-credit
- Open-Sans Condensed Font
  - CTS Approved

Initial Mock-Up vs Final Product

CHECKER SIGN IN PAGE



Gordon College Christian Life and Worship Credit System

GORDON
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Proceed

Jonathan Manos
is an authorized Christian Life and
Worship Credit Checker

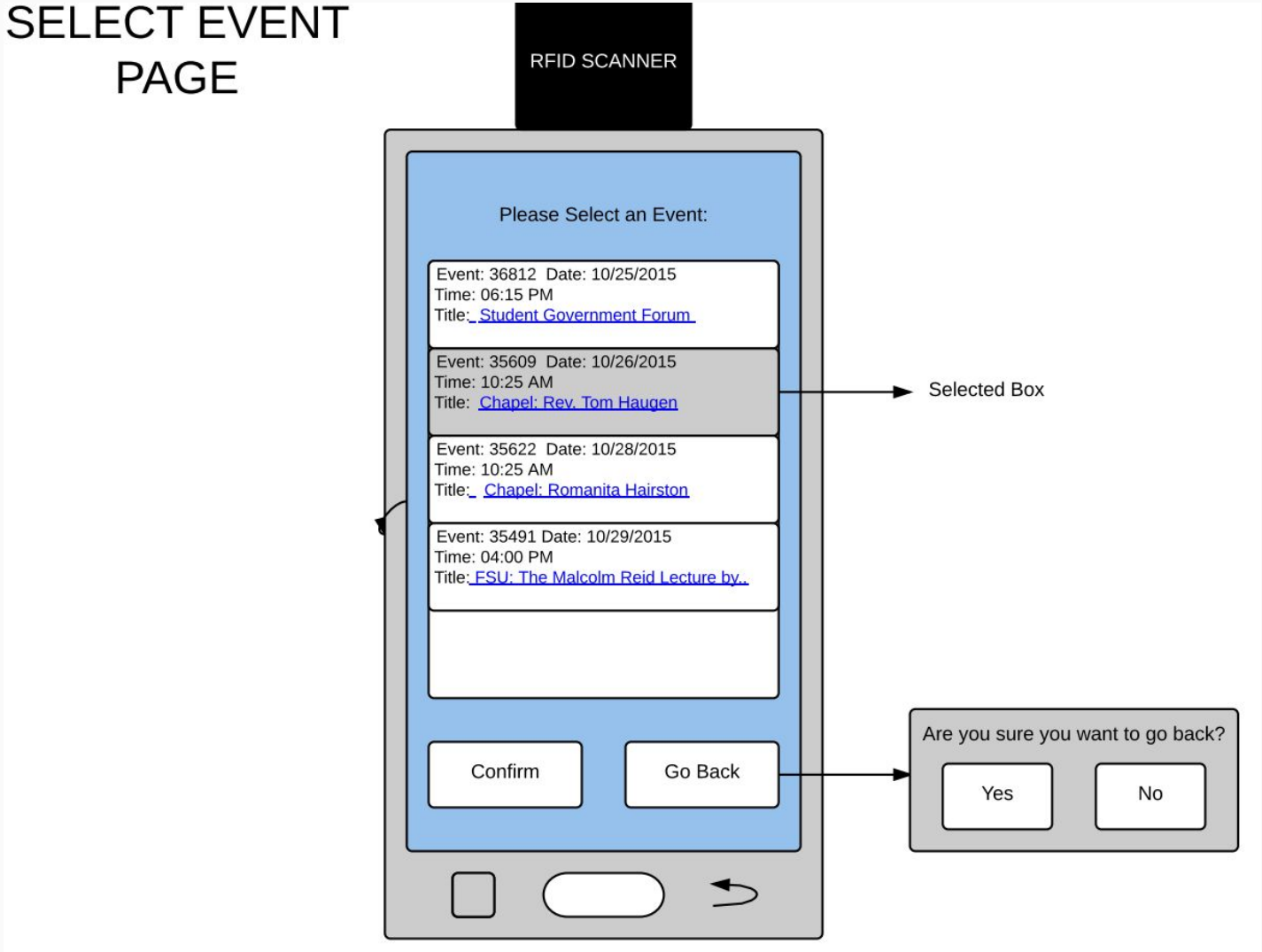
Update Database

(takes about 15 seconds)

Updated: 4/28/2016 3:51:12 PM

Connected to DeviceID: 2355

SELECT EVENT PAGE



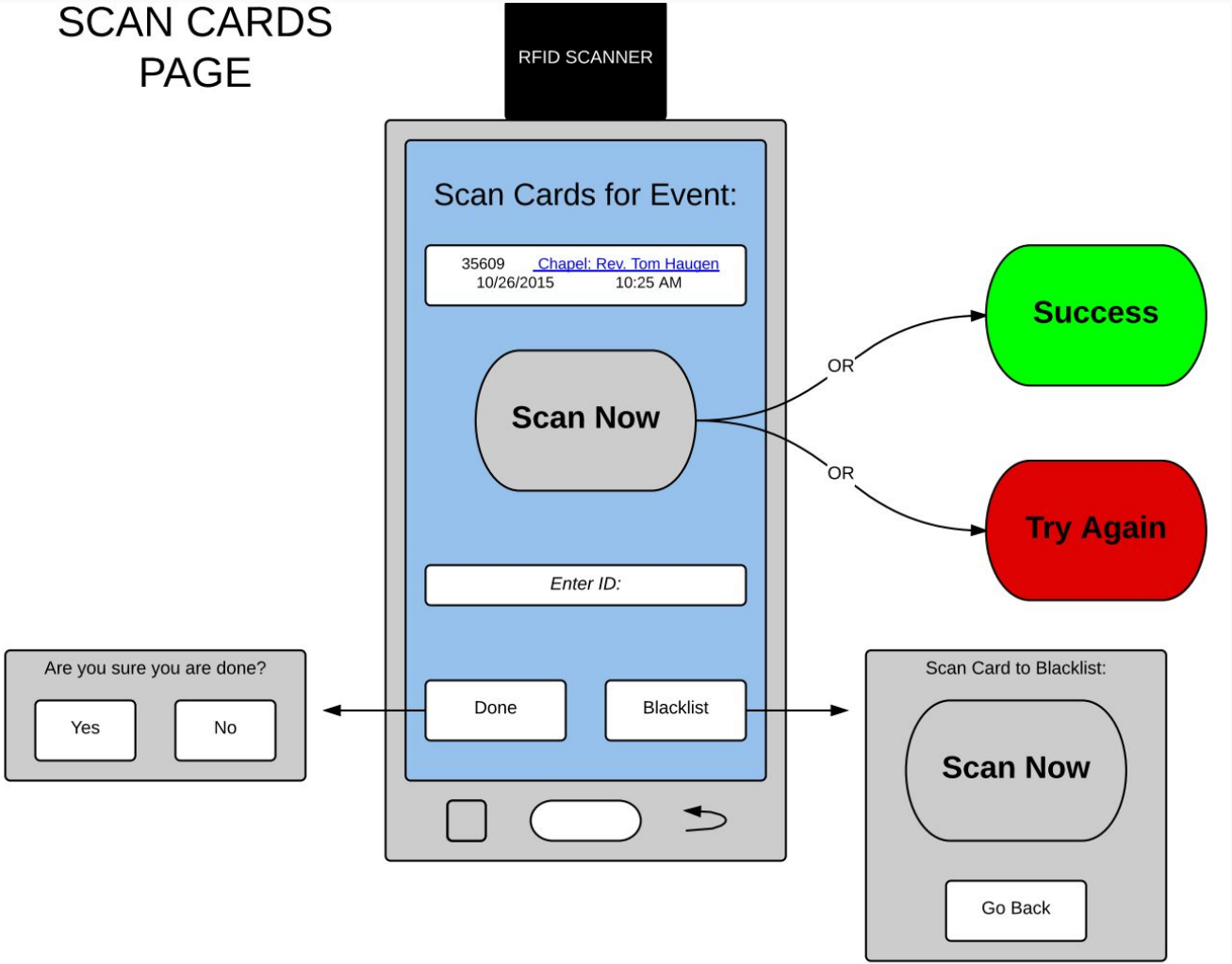
Select an Event:

4/21/2016 8:00:00 AM	Symposium: Kayaking to Little Misery Isl...
4/21/2016 9:30:00 AM	Symposium: JAF Post Debate Discussion
4/21/2016 9:30:00 AM	Symposium: History: The Most Liberal Art...
4/21/2016 9:30:00 AM	Symposium: How the Liberal Arts Prepares...
4/21/2016 10:00:00 AM	Symposium: Get to Know your Backyard, Go...
4/21/2016 11:00:00 AM	Symposium: Liberating the Film Genres: S...
4/21/2016 11:00:00 AM	Symposium: Liberal Arts and The Past: Hi...
4/21/2016 11:00:00 AM	Symposium: Benefits of Learning a Second...
4/21/2016 11:00:00 AM	Symposium: The Art of Writing
4/21/2016 11:00:00 AM	Symposium: REACH Drama Ministry
4/21/2016 12:00:00 PM	Symposium: Illusions of Love
4/21/2016 1:00:00 PM	Symposium: Why Liberal Arts? A College A...
4/21/2016 1:00:00 PM	Symposium: Poetry: Liberating Ourselves ...
4/21/2016 1:00:00 PM	Symposium: Critiques of the Christian Li...
4/21/2016 1:00:00 PM	Symposium: Storytelling
4/21/2016 2:30:00 PM	Symposium: Listen: A Voice for all in Li...
4/21/2016 2:30:00 PM	Symposium: Seeking Wisdom on the Mountai...
4/21/2016 2:30:00 PM	Symposium: Breaking Barriers with Libera...
4/21/2016 2:30:00 PM	Symposium: The Fibonacci Sequence: Spira...

Back

Ok

SCAN CARDS PAGE



Scanning for Event:

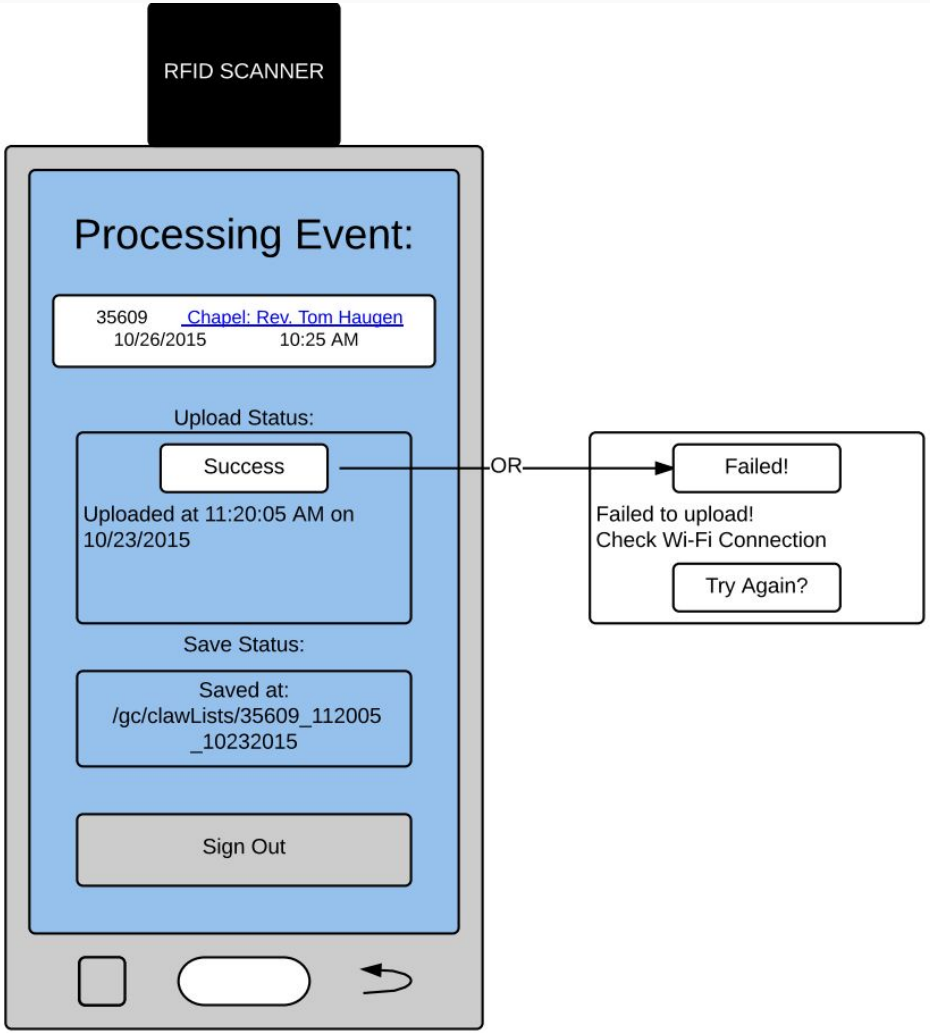
4/21/2016 11:00:00 AM
Symposium: The Art of Writing

Stop Scan

Jonathan Manos
will receive credit.

☐ No Credit Scan

RESULTS PAGE



Results

Scanning complete for:

4/21/2016 11:00:00 AM
Symposium: The Art of Writing

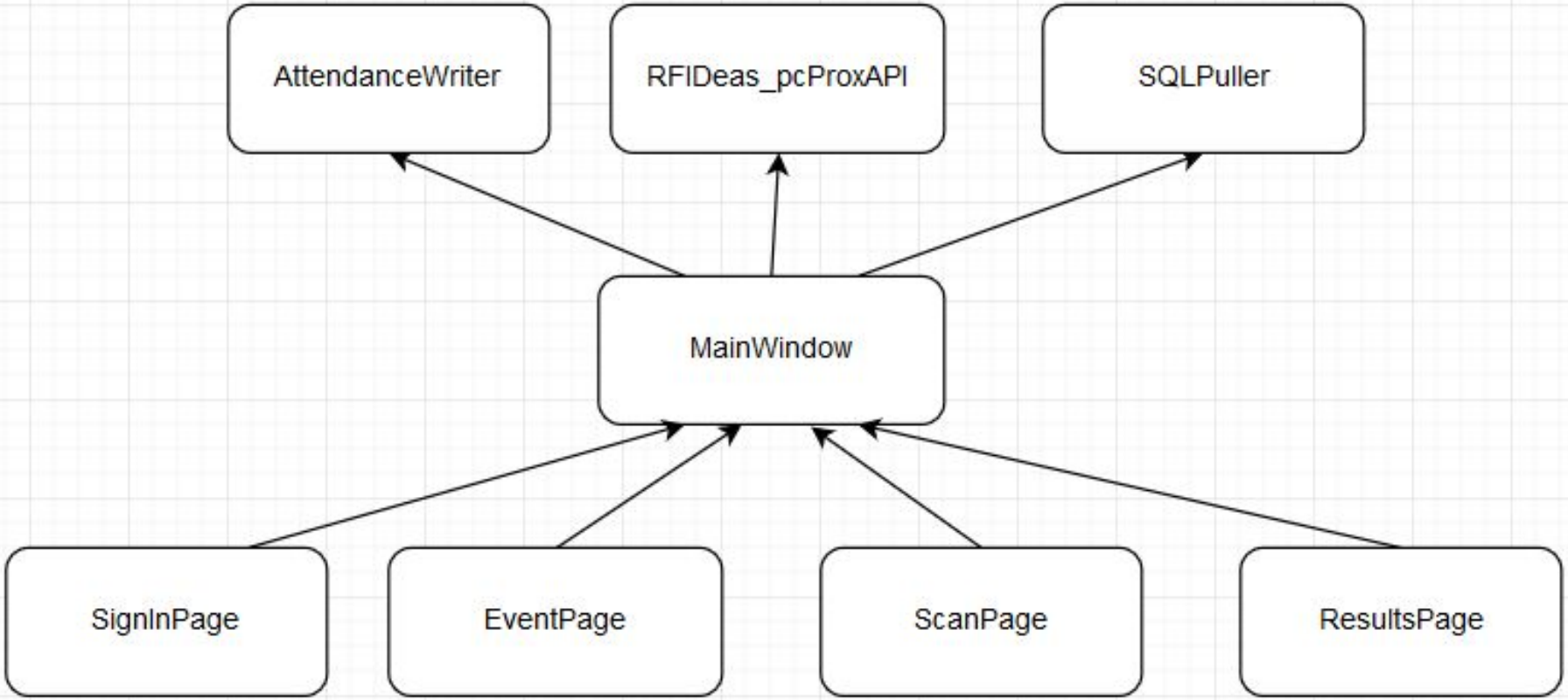
1 Student Scanned

Scanning Time: 12:50

Back to Sign-in

System Design

CLAW Credit Checker Application Structure



SQLPuller.cs

pullStudents()

```
sql = @"select validine_id, barcode, firstname, lastname
            from Attendum.dbo.account";
…..

attendanceWriter.CreateStudentsTextFile();

        while (dataReader.Read())
        {
            attendanceWriter.WriteStudentsTextFile(dataReader.GetValue(0).ToString(),
                                                   dataReader.GetValue(1).ToString(),
                                                   dataReader.GetValue(2).ToString(),
                                                   dataReader.GetValue(3).ToString());
        }
```

AttendanceWriter.cs

- Functions to create files
- Functions to write to files
- Functions to read from files

AttendanceWriter.cs

WriteStudentsTextFile(...)

```
public void WriteStudentsTextFile(string studentID, string studentBarcode, string lastName, string firstName)
{
        StreamWriter file = new StreamWriter(STUDENTSPATH, true);

        file.WriteLine(studentID + SC + studentBarcode + SC + lastName + SC + firstName);
        file.Close();
}
```

RFIDeas_pcProxAPI.cs

Class Provided by RF IDeas

Functions we used:

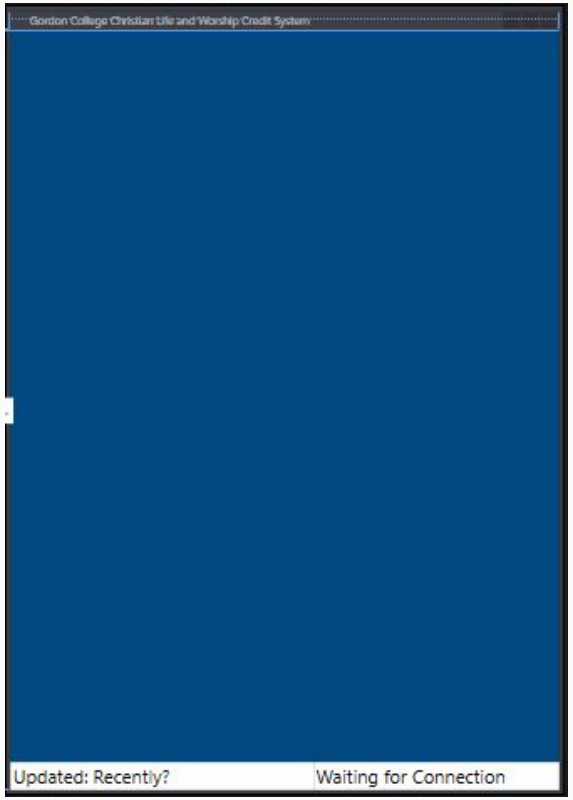
- pcProxDLLAPI.usbConnect() - connects the USB device
- pcProxDLLAPI.USBDisconnect() - disconnects the USB device
- pcProxDLLAPI.GetDID() - gets the Device's ID number
- pcProxDLLAPI.WriteCfg() - writes a new configuration to the device
- pcProxDLLAPI.ReadCfg() - reads the device's current configuration
- pcProxDLLAPI.getActiveID(8) - gets the bits found from the usb device
- pcProxDLLAPI.getActiveID_byte(i) - gets the byte found at the specified index

User Interface Design

MainWindow.xaml

SignInPage.xaml

Final Product



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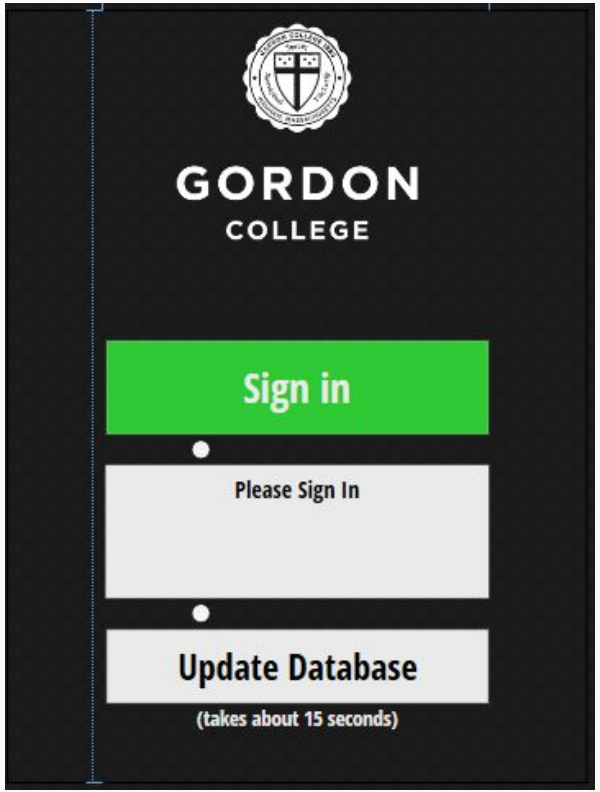

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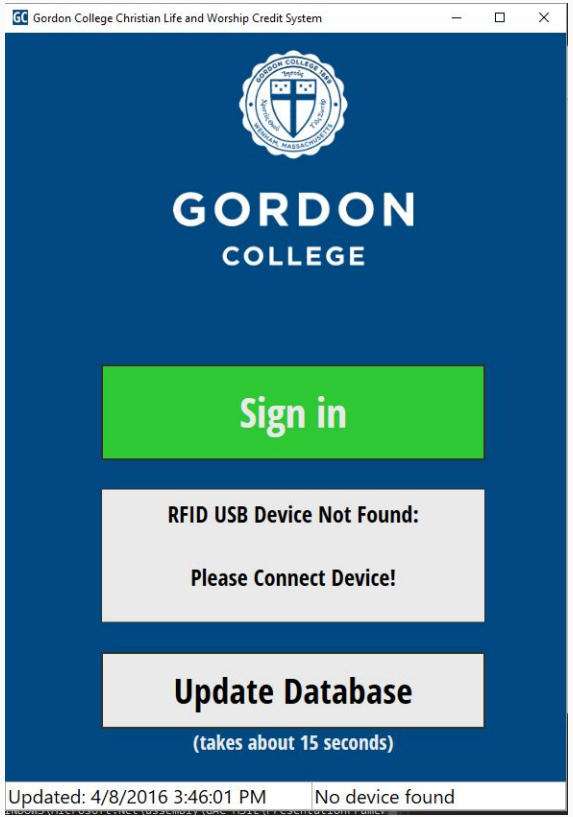
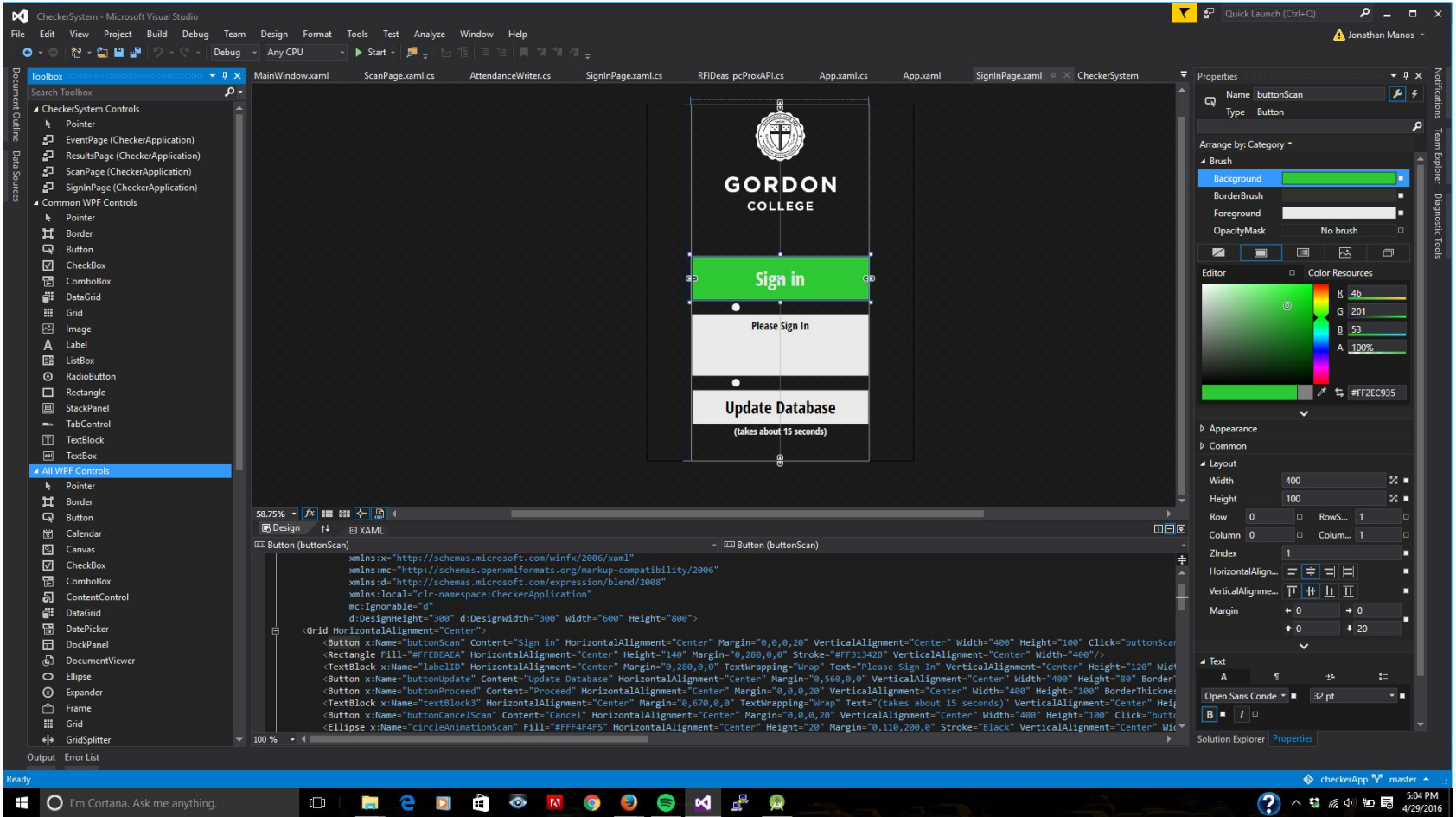
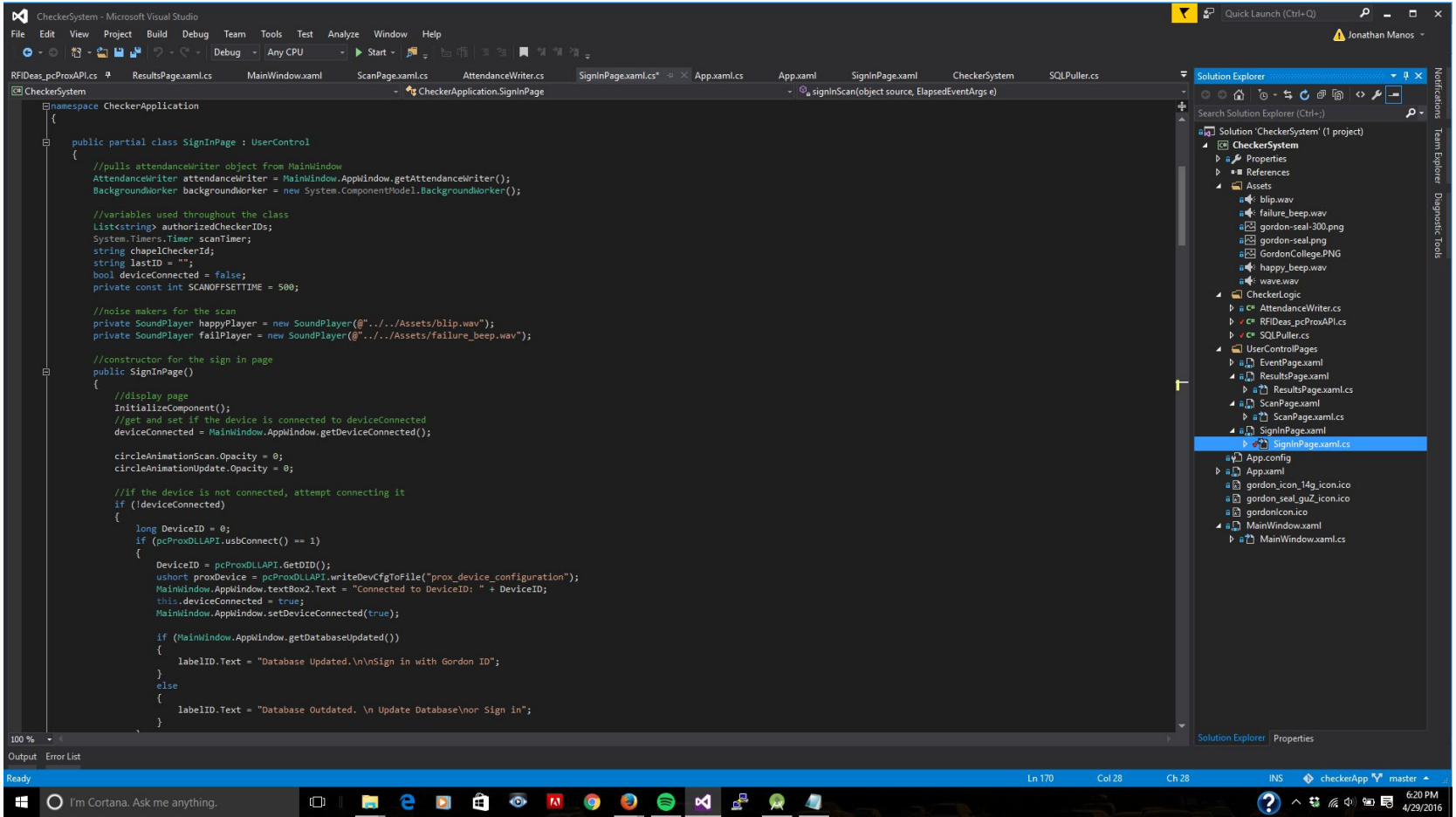


SignInPage.xaml



SignInPage.xaml.cs



Data Storage

Data

- Uses Windows User Authentication
  - Must be signed into device as “Chapel Checker”
  - Connected to the Gordon Domain
- Updating the App’s Database pulls straight from Gordon’s SQL Databaese
- Pulls 3 categories of information
  - Events.claw (from a week ago till the end of the semester)
  - Checkers.claw (authorized chapel checkers)
  - Students.claw (ID information on all Gordon students)
- Device keeps track of last update date and time
  - Date.claw (kept with other saved data)

Line Of Data

- Event
  - 94220†Ten Principles for Highly Ethical Managers and Economists†Ten Principles for Highly Ethical Manage...†4/26/2016 4:30:00 PM†4/26/2016 5:45:00 PM
- Checker/Student
  - 18815†216070004030 52†Jonathan†Manos
- Date
  - 4/29/2016 5:19:35 PM

Attendance File

- Upon reaching scan page, creates attendance file with unique name (Attendance_dateTime_deviceName.claw)
  - Attendance_20160428160109_Jonny-PC.claw
- Upon each scan, writes a line in the file (studentBarcode,checkersBarcode, noCreditValue,eventID,dateTime)
  - 21607000417698,21607000403052,0,94354,20160428 16:13:45

Testing

Testing

- Started off as optional scan in the chapel lobby
  - To test with more/different cards
  - found bugs
- Scanned in front of official checker
  - To compare scanned lists with the actual checker
  - Identical list besides one person’s card which was nonfunctional
- Tested speeds of checkout in class
  - Fastest ~ 1 second per person
  - Slowest ~ 2 seconds per person
  - Estimated speed ~ 1-2 seconds per person

Quick Live Demo

Questions

Demo