Project Plan
Banking with Amazon’s Alexa and Apple’s Siri
The Capstone Experience

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Functional Specifications

- Expand MSUFCU’s digital banking offerings
- Allow users to easily access their accounts through Alexa, Siri, and Google Now
- Make mobile banking easier with smartwatch interfaces
- Allow MSUFCU to quickly update available information through an administrative web portal
Design Specifications

• Smartwatch interfaces
  ▪ WatchOS interface is a combination of touch controls on the watch and voice commands with Siri
  ▪ Android watch uses both touch controls and Google Now to perform tasks
• Alexa interface uses only voice commands
• Web portal interface
  ▪ Web page with overview of system
  ▪ Administrators can update user experiences directly from page
Screen Mockup: Apple Watch
Screen Mockup: Android Wear
Screen Mockup: Alexa

Alexa, ask MSUFCU how much I have in my checking account

Please state your authentication PIN

1 2 3 4

Thank you. Your current checking balance is $2345.67
Screen Mockup: Web Portal

FAQs:
- What is my MSUFCU account number?
- How can I join MSUFCU if no one in my family is a member, I'm not an MSU student and I do not work for either university?
- I joined the MSU Alumni Association/Michigan United Conversation Clubs in order to become an MSUFCU member. Do I need to renew my membership with them to remain an MSUFCU member?
- What is the routing number at the credit union?
- Is there a fee to open an account with MSUFCU?
- Can I open a checking account without having a Spartan Saver account?...

ANALYTICS OVERVIEW:

Number of times people ask...

<table>
<thead>
<tr>
<th>Month</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
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<tbody>
<tr>
<td>Count</td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
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# Screen Mockup: Web Portal

<table>
<thead>
<tr>
<th>Capability</th>
<th>Alexa</th>
<th>WatchOS</th>
<th>Android Wear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask for account balance</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Make quick transactions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Make appointments</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Find nearest ATM</td>
<td></td>
<td>✓</td>
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</tr>
</tbody>
</table>

... ...
Technical Specifications

- Apple Watch: runs on IOS and codes in Swift.
- Android Wear: runs on Android and codes in Java.
- Amazon Alexa: uses Alexa Skills Kit for speech to text, uses Node.js to parse server packages.
- Administrative Portal: runs and codes on JavaScript, HTML and CSS
- Middleware: runs and codes on PHP.
- Communication: IOS, Alexa, and Android communicate with Middleware class in the web portal using JSON. Middleware communicates with Database using Database Queries.
- Security: Transparent Data Encryption (TDE) technology will be used to ensure the security of the database. To encrypt a database, a master key should be created to protect the database.
Technical Specifications

• Voice interfacing
  - Amazon Alexa
  - Apple Watch (Siri)
  - Android Wear (Google Now)
System Architecture

The Capstone Experience

Team MSUFCU Project Plan
System Components

- **Hardware Platforms**
  - Apple Watch / iPhone
  - Android Wear / Android phone
  - Amazon Echo / smartphone
  - Rack mounted server

- **Software Platforms / Technologies**
  - WatchOS (Swift)
  - Android (Java)
  - Alexa Skills Kit
  - PHP
  - MySQL
  - Encryption based on SQL standards / TDE
  - JavaScript/HTML/CSS
Testing

• Accessing database from API middleware
• Accessing database from devices through the API
• Testing updating the database through the web portal and the different platforms
• Using fake accounts, test that all devices work according to the design specifications
• Testing voice commands with Siri, Google Now, and Alexa with unit testing
Risks

• Utilizing Voice Recognition Capabilities
  ▪ Description: Development for Apple’s Siri and Google Now platform have only recently been made open to the public, and the exact capabilities are still unknown
  ▪ Mitigation: Work on prototypes to test different tasks that we want the application to be able to do

• Creating a central API for Watches and Voice
  ▪ Description: We need a centralized database and API that all of the different devices will be able to access - no one on the team has made an API before
  ▪ Mitigation: Work with client to understand their database schema, and research technologies that can be used for the API. Create a prototype that can retrieve a piece of information from the database and send it to each of the three device types

• Creating Cards for Alexa app
  ▪ Description: Development for Alexa comes with the possibility of pushing information directly to the Alexa app for users to view; however, no one on the team has any experience doing this
  ▪ Mitigation: Creating a test application that users can speak to, then find the information they are seeking also available as a card on the Alexa app
Risks

• Modular design of Watch apps
  ▪ Description: The watch apps must be modularly designed so that the administrative web portal can add or remove content such as FAQs. Ensuring this type of modularity in both UI and voice commands may be difficult or impossible with the current capabilities and limitations of watch software.
  ▪ Mitigation: Research methods of achieving the modularity goal with the current watch technology. Test an implementation of the design on a skeleton app.

• Authenticating Voice for Siri, Alexa, and Google Now
  ▪ Description: Accessing sensitive account data requires authentication over voice. None of the team has any experience with voice authentication
  ▪ Mitigation: Research possible methods of voice authentication and create a few prototypes to test each method