

**Top This Donut Bar: iOS Mobile Application**

By

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A Proposal Submitted to  
The Faculty of the School of Information Technology  
in Partial Fulfillment of the Requirements for  
the Degree of Bachelor of Science  
in Information Technology

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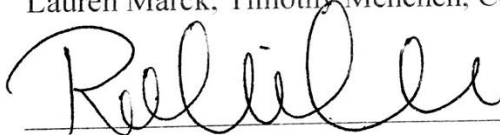
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April 12, 2016

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Date



4/18/16

Robin Carew, Faculty Advisor

Date

University of Cincinnati  
School of Information Technology  
College of Education, Criminal Justice, and Human Services

April 2016

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## **Abstract**

Top This Donut Bar gives people the opportunity to reimagine the traditional glazed donut with a variety of mix-and-match flavors and toppings completely customized by you. Up to this point, the only thing standing between you and your perfect donut creation was a line of indecisive customers. By creating a mobile iOS application, customers can finally let their creativity shine without the worry of waiting in line. Customers can download this application for free on their iPhone or iPad from the Apple App Store. Using Swift, Apple's new programming language, the Top This Donut Bar mobile application integrates seamlessly with built-in device capabilities such as Google Maps, to find the nearest store location, and Apple Pay, for quicker checkout. Customers can now pick up a tasty treat for themselves, or even for the whole office. Say goodbye to those Monday morning blues with the Top This Donut Bar mobile application!

## **Introduction**

The general population is becoming progressively impatient. “In a survey conducted by USA today, the majority of Americans would not wait in line longer than 15 minutes” (Dye 2012). Half of those Americans would not return to a place that kept them waiting (Dye 2012). Top This Donut Bar, a new local Cincinnati company that specializes in the custom creation of donuts for customers, would like to avoid this problem. The company’s goal is to eliminate the need for customers to wait in line for their donuts by implementing an online ordering mobile application. Customers who wish to order their donuts online will be able to skip to the front of the line, grab their unique creation and continue with their day.

## **Problem**

One issue for our team is the lack of knowledge with the iOS development platform for Apple devices. Having familiarity with mobile development for Android devices as well as the methodologies associated with it should make the learning process much easier when it comes to developing the application.

Another possible problem with developing this application is the potential inability to integrate payments with the company’s POS system. The company has decided to remove its current POS system and is still undecided on when the new system will be installed. Without a POS system, it will make it more challenging to implement an online payment system for each specific Top this Donut Bar location. If this is the case, other payment options will still be viable for making payments.

## **Solution**

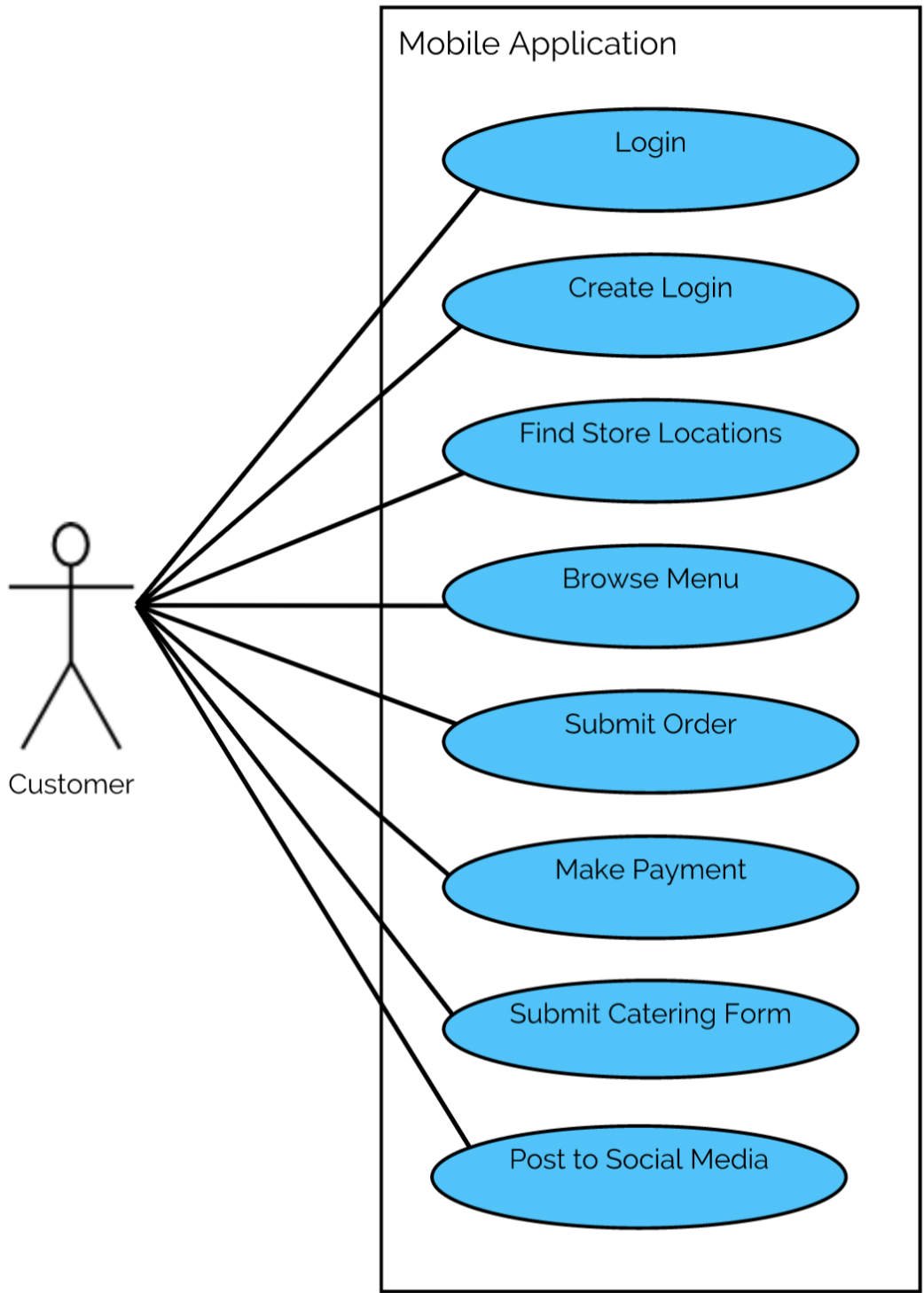
Develop an iOS mobile application for iPhones and iPads using the programming language Swift that will allow any consumer to send an order to a particular Top This Donut Bar store from the app. The Top this Donut Bar company would like to have its locations displayed, a menu for the various base products and toppings available for purchase, online ordering capabilities and a catering request form within the application. The application will integrate with Heartland Payment Systems to accept online payments. The idea behind this application is that a user can quickly create an order on their way to work or some other place without having to wait in a long line for their breakfast or snack. In addition to smaller orders, an employee may feel that it is necessary to bring a little happiness to the workplace by ordering a large amount of donuts for everyone. This application will also allow customers to request a catering order so Top This Donut Bar can come and serve that company. Top This Donut Bar hopes to bring awareness to its brand, attract new customers, and compete with other various competitors with the addition of a mobile application.

## **User Profile**

The potential users for the Top This Donut Bar application are customers that are familiar with using iOS mobile applications. The customers will be able to find locations, browse a menu, place an order, and submit a catering request form. The user interface will be simple and intuitive, have easily accessible tabs, and an interactive map. The following two figures provide more user details.

<p>Potential User:</p> <ul style="list-style-type: none"><li>• Top This Donut Bar Customer (16 years or older)</li></ul>
<p>Software and Interface Experience:</p> <ul style="list-style-type: none"><li>• The typical Top This Donut Bar Customer has moderate to high experience using iOS mobile applications.</li></ul>
<p>Experience with Similar Applications:</p> <ul style="list-style-type: none"><li>• Typical Top This Donut Bar Customers are familiar with using similar mobile applications, such as Chipotle's.</li></ul>
<p>Task Experience:</p> <ul style="list-style-type: none"><li>• The Customers will be comfortable with and able to find nearby locations, look at the menu, make an online order, and submit a contact/cater request form.</li></ul>
<p>Frequency of Use:</p> <ul style="list-style-type: none"><li>• This application will be heavily used by Top This Donut Bar Customers and System Admins during normal business hours (6:00AM – 11:00PM).</li></ul>
<p>Key Interface Design Requirements that the Profile Suggests:</p> <ul style="list-style-type: none"><li>• Simple and intuitive UI</li><li>• Easily accessible navigation tabs/buttons at the bottom</li><li>• Interactive map</li></ul>

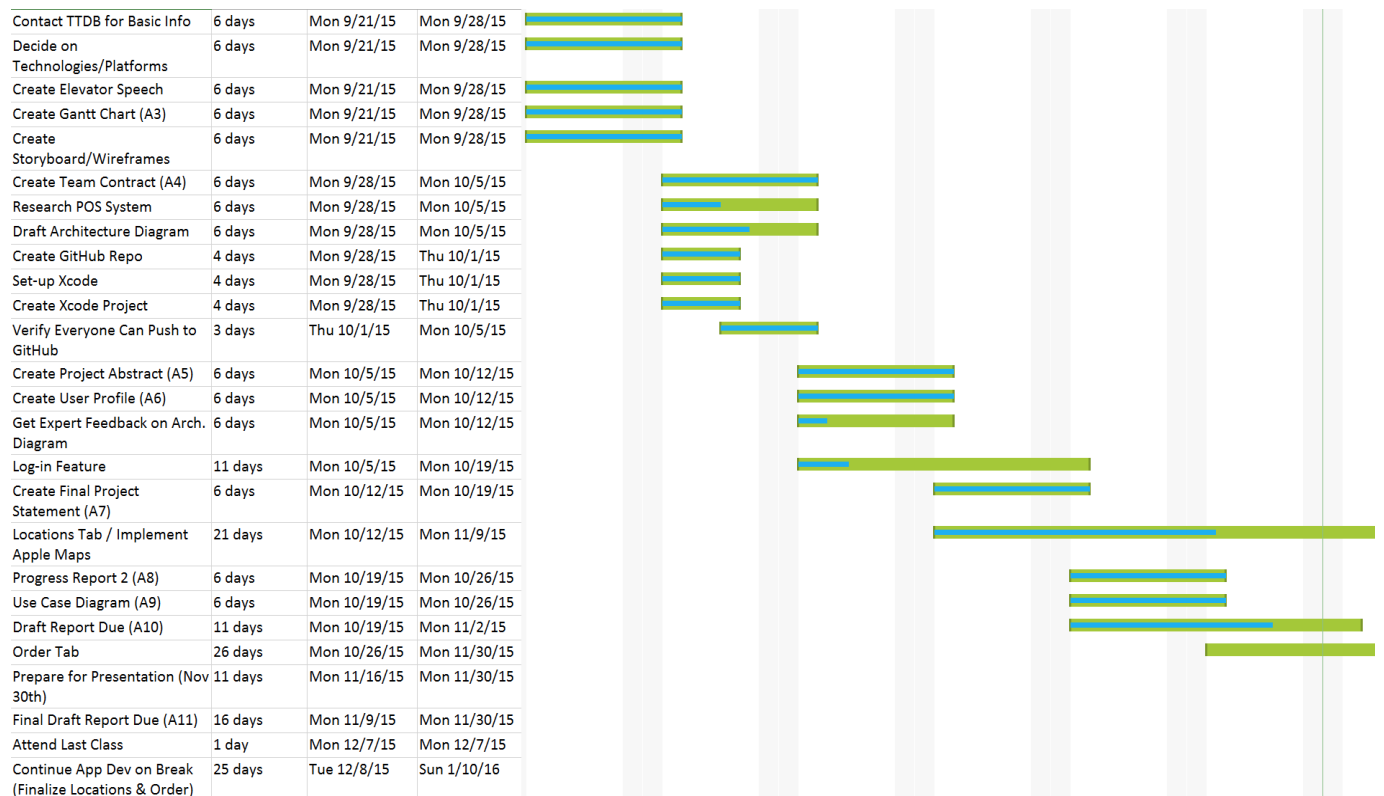
**Figure 1: User Profile**



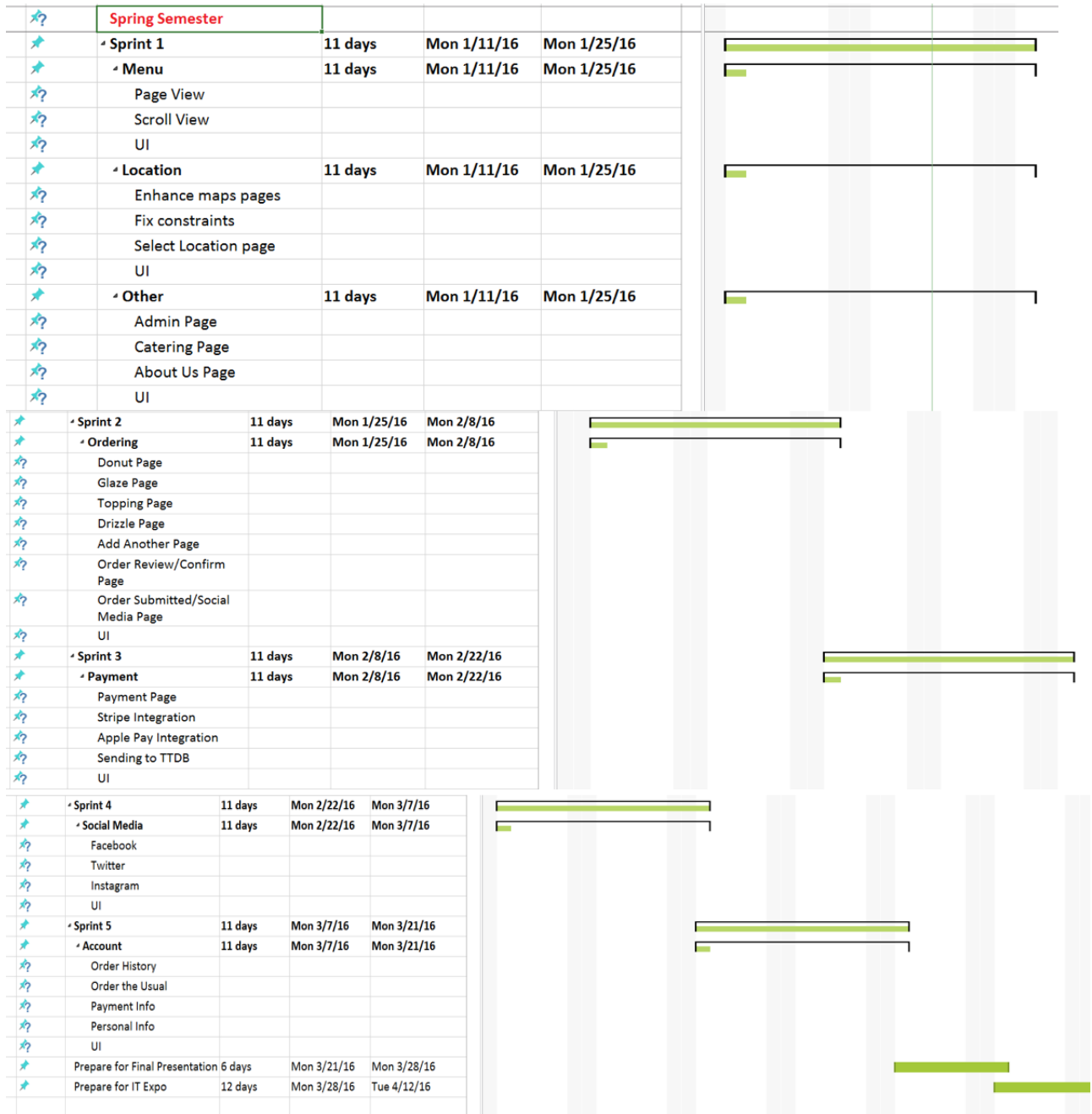
**Figure 2: Use Case Diagram**

## Timeline

The following two figures provide our proposed timelines for both fall and spring semesters. Last fall semester we stayed close to our projected target, but learning the new technology proved to be challenging and put us slightly behind on key items. Throughout the fall semester we partially created the Menu, Order, Account, Location, About, Catering Request and FAQs views. We were able to fully complete the development work for the Account, Location and FAQs views. For the spring semester, we focused mainly on the Menu and Order views while also focusing heavily on the payment functionality. We also constructed a major UI clean up of the application to make sure the overall look and feel was what we had originally envisioned.



**Figure 3: Proposed Timeline for Fall Semester**



**Figure 4: Proposed Timeline for Spring Semester**

## Proposed Budget

Apple offers students a discount on their products, including a \$200 discount on MacBooks and a \$20 discount on iPads. Both an Apple Developer License and Lynda training for students are free. This means that the cost for a student to develop and test a mobile application is approximately \$3,380. On the other hand, it would cost around \$4,070 for someone who was not a student and had to pay full price for Apple products, the Apple Developer License, and a Lynda subscription.

Student Budget		Non-Student Budget	
<i>Item</i>	<i>Cost</i>	<i>Item</i>	<i>Cost</i>
MacBook Pro (15-Inch)	\$2,300	MacBook Pro (15-Inch)	\$2,500
Apple Developer License (Student)	\$0	Apple Developer License (Business)	\$100
Xcode	\$0	Xcode	\$0
iPhone 6 (64GB)	\$650	iPhone 6 (64GB)	\$650
iPad Air (32GB)	\$430	iPad Air (32GB)	\$450
Swift Development Training (Lynda)	\$0	Swift Development Training (Lynda)	~\$370/year
<b>Total</b>	<b>\$3,380</b>	<b>Total</b>	<b>~\$4070</b>

**Table 1: Student vs. Non-Student Budget for Development/Testing**

As for the client, Top This Donut Bar, it would cost them \$2,860 to obtain a mobile application for their company. If Top This Donut Bar went to a mobile development consulting company, they would have to pay a fee for the application itself, as well as a fee for on-going support and maintenance. By having students create their application, they will not have to pay a single dime.

Top This Donut Bar Budget (by Student)		Top This Donut Bar Budget (by Consultant)	
<i>Item</i>	<i>Cost</i>	<i>Item</i>	<i>Cost</i>
Mobile App Development	\$0	Mobile App Development	\$2,500
Mobile App Support	\$0	Mobile App Support (for 1 year)	\$360
<b>Total</b>	<b>\$0</b>	<b>Total</b>	<b>\$2,860</b>

**Table 2: Top This Donut Bar Budget – Student vs. Professional Consultant**

## **Technical Elements**

Swift: Swift is the main programming used for the iOS development. Through this language we were able to incorporate storyboards for the main UI functionality. The use of the Cocoa framework in Swift allows the use of outside frameworks and APIs, such as, Google Maps.

Parse: Parse is the mBasS (Mobile Back-end as a Service) used. Here, objects are stored as JSON (JavaScript Object Notation) as the main products, toppings, and users. Parse also provides analytics about the application such as users, sessions and downloads.

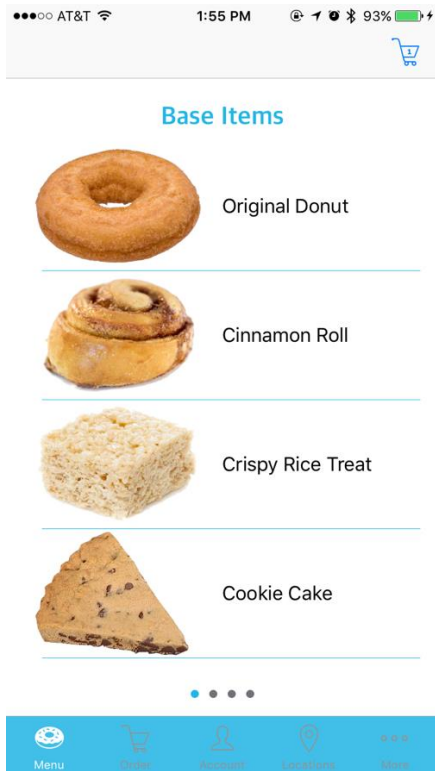
Heartland: Heartland is the payment process service used by Top This Donut Bar. They receive payment information in a secure method and processes payments quickly.

Xcode: Xcode is the main IDE (Integrated Development Environment) used for all Apple software such as OSX and iOS.

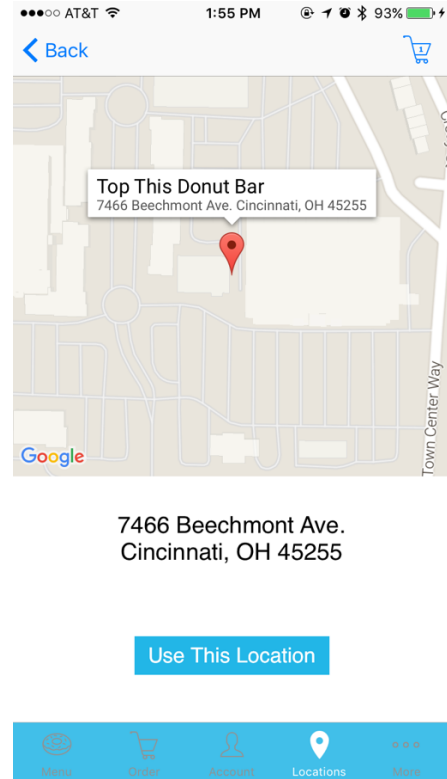
GitHub: A web based source control Git repository hosting service.

## **Application Examples**

Figure 5 shows a screenshot of the first screen upon launching the application, which is the first page of the Menu. You can swipe through the Menu and see the various starter products, glazes, toppings, and drizzles. Figure 6 shows the screen that is displayed once a specific location is chosen from the list of the locations. This screen displays the location on a map, which uses Google Maps, the exact address of the store, and a button titled, “Use This Location,” which saves the location as the user’s preferred store.



**Figure 5: Menu Screenshot**



**Figure 6: Location Screenshot**

## Testing

### Overview:

This section will explain the testing methodology for the Top This Donut Bar iOS mobile application, which can be run on both iPhones and iPads. The testing will be based on the requirements of the application. The purpose of testing is to be sure that all components of the application are working as expected.

### Error Handling:

If there is an error causing a test case to fail, the error will be recorded. The team will discuss the severity of the error, whether or not this type of failure has happened before, and how to fix the error. Once the error is believed to be fixed, the test will be run again to be sure it

passes. It is expected that the Top This Donut Bar iOS mobile application will pass every test in order to be successful.

#### Requirements for Test Plan:

1. Stability
  - a. The application stably runs on iPhone device without breaking.
  - b. The application stably runs on iPad device without breaking.
2. User Registration
  - a. Parse database API integrated into project.
  - b. “Create New Account” button will navigate to registration screen.
  - c. User can create a new unique account.
  - d. Accounts are stored into database.
3. Login Authentication
  - a. Account tab will prompt user to log in or create new account.
  - b. User login is successful.
  - c. Login takes user to Account screen.
  - d. User session is maintained until logout.
4. Map Display
  - a. Google Maps API integrated into project.
  - b. Maps are displayed when locations tab is clicked.
  - c. Correct map is shown based on location clicked.
  - d. Directions, phone number, and store hours presented for specific location.
5. Menu Display
  - a. Parse database API integrated into project.

- b. Data is pulled from database.
  - c. New added data syncs into application.
6. About the Company
- a. About Us page is displayed when the About tab is clicked.
7. Help/FAQs
- a. Questions are displayed when FAQs tab is clicked.
  - b. Clicking on a question displays an answer.
  - c. One question is displayed at a time.
8. Ordering Process
- a. Order tab takes user to the ordering page.
  - b. User can only select ONE donut at donut selection page.
  - c. User can only select ONE glaze at glaze selection page.
  - d. User can select MULTIPLE toppings at topping selection page.
  - e. User can select MULTIPLE drizzles at drizzle selection page.
  - f. User can select the store for pickup.
  - g. User can choose to add more donuts or checkout.
  - h. User can type text to make special requests.
  - i. Order review page is shown before submitting.
  - j. Data is stored in the database.
9. Payment Process
- a. Heartland API integrated into project.
  - b. ~~User can choose to pay at the store.~~
  - c. User can choose to pay from the application.

- d. User is required to fill out information (name, email, address...).
- e. Order payment is processed.
- f. Mailgun e-mail API integrated into project.
- g. Email notification is sent to user.

#### 10. Social Media Integration

- a. Facebook and Twitter social media API integrated into project.
- b. Facebook can be accessed from order confirmation page for sharing order.
- c. Twitter can be accessed from order confirmation page for sharing order.
- d. Access TTDB social media accounts from About Us page.

#### 11. Catering Form Submission

- a. Catering tab takes user to the catering form page.
- b. Form requires all fields to be filled and meets all criteria.
- c. Form is submitted and emailed to company.

#### 12. Navigation

- a. All page navigation works.
- b. All button input give an output.

#### 13. User Interface and Experience

- a. The background color is white.
- b. The company color blue (#22B6E7) is used throughout.
- c. Application has a consistent UI throughout.

## **Conclusion**

What makes Top This Donut Bar so unique is the fact that they give people the opportunity to reimagine the traditional glazed donut with a variety of customizable mix-and-match flavors and toppings. With the general population becoming more and more impatient, Top This Donut Bar wants to appeal to all of those not wanting to wait in line by implementing an online ordering mobile application. Customers who wish to order their donuts online will be able to skip to the front of the line and quickly continue with their day.

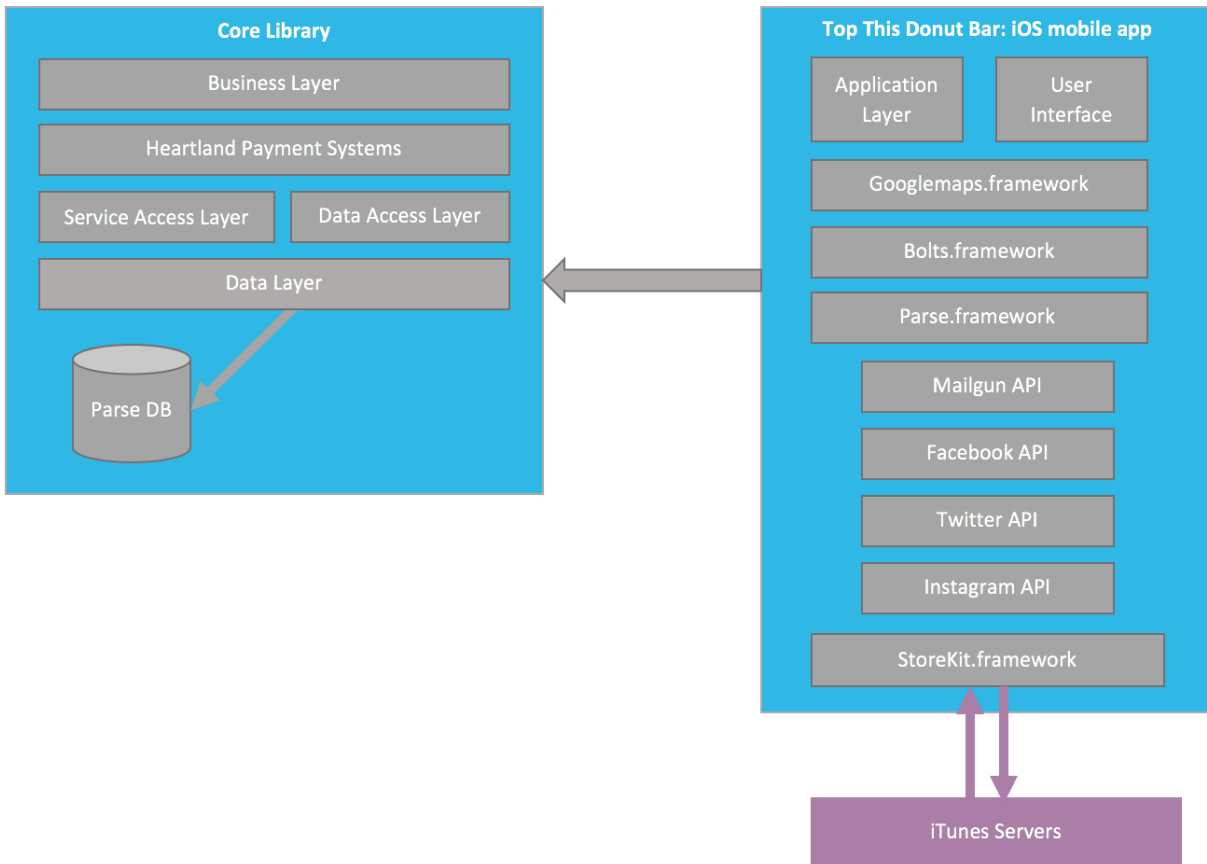
Customers will be able to download this application for free on their iPhone or iPad from the Apple App Store. Once the application is downloaded, they will be able to search and find store locations, select a location and create an online order, browse the menu, and submit catering request forms. Top This Donut Bar hopes to bring awareness to its brand, attract new customers, and compete with other various competitors with the addition of this mobile application.

## References

Dye, Eric. "Is the Internet Making Us Impatient?" ChurchMag. March 15, 2012. Accessed October 19, 2015.

## Appendix A: Architecture Diagram

The following is an architecture diagram for the Top This Donut Bar iOS mobile application.



## Appendix B: User Test Plan

The following is the user test plan to be used for the Top This Donut Bar iOS mobile application.

Date	Case	Requirements	Description / Expected Result	Actual Result	Pass/Fail	Notes
4/4/16	1	<b>Stability</b>	Runs on iPhone device without breaking	As expected	Pass	
4/4/16			Runs on iPad device without breaking	UI is off	Pass	Need to work on constraints
4/4/16	2	<b>User Registration</b>	Parse database API integrated into project	As expected	Pass	
4/4/16			Button will navigate to registration screen	As expected	Pass	
4/4/16			User can create a new unique account	As expected	Pass	
4/4/16			Accounts are stored into database	As expected	Pass	
4/4/16	3	<b>Login Authentication</b>	Account tab will prompt user to log in	As expected	Pass	
4/4/16			User login is successful	As expected	Pass	
4/4/16			Login takes user to Account screen	As expected	Pass	
4/4/16			User session is maintained until logout	As expected	Pass	
4/4/16	4	<b>Map Display</b>	Google Maps API integrated into project	As expected	Pass	
4/4/16			Maps are displayed when locations tab is clicked	As expected	Pass	
4/4/16			Correct map is shown based when the location clicked	As expected	Pass	
4/4/16			Directions, phone number, and store hours presented for specific location	Phone # presented	Fail	Need to add directions/store hours
4/4/16	5	<b>Menu Display</b>	Parse database API integrated into project	As expected	Pass	
4/4/16			Data is pulled from database	As expected	Pass	
4/4/16			New added data syncs into project	As expected	Pass	
4/4/16	6	<b>About the Company</b>	About Us page is displayed when the About tab is clicked	As expected	Pass	
4/4/16	7	<b>Help/FAQ</b>	Questions are displayed	As expected	Pass	
4/4/16			Clicking on a question displays an answer	As expected	Pass	
4/4/16			One question can be displayed at a time	As expected	Pass	
4/4/16	8	<b>Ordering Process</b>	Order tab takes user to the ordering page	As expected	Pass	
4/4/16			User can select "Donut of the Month"	N/A	Fail	Need to add this functionality
4/4/16			User can only select ONE donut at donut selection page	As expected	Pass	
4/4/16			User can only select ONE glaze at glaze selection page	As expected	Pass	
4/4/16			User can select MULTIPLE toppings at topping selection page	As expected	Pass	
4/4/16			User can select MULTIPLE drizzles at the drizzle selection page	As expected	Pass	
4/4/16			User can select the store for pickup	As expected	Pass	
4/4/16			User can choose to add more donuts or checkout	As expected	Pass	
4/4/16			User can type text to make special requests	N/A	Fail	Need to add this functionality
4/4/16			Order review page is shown once payment is received	As expected	Pass	
4/4/16			Data is stored into database	As expected	Pass	
4/4/16	9	<b>Payment Process</b>	Heartland payment API integrated into project	As expected	Pass	
4/4/16			User can choose to pay at the store	N/A	N/A	TTDB did not want this
4/4/16			User can choose to pay from the application	As expected	Pass	User must pay with app
4/4/16			User is required to fill out information (name, email, address..)	As expected	Pass	
4/4/16			Order payment is processed	As expected	Pass	
4/4/16			Mailgun e-mail API integrated into project	As expected	Pass	
4/4/16			Email notification is sent to user	As expected	Pass	
4/4/16	10	<b>Social Media Integration</b>	Facebook, Twitter, Instagram social media API integrated into project	As expected	Pass	
4/4/16			Facebook can be accessed from order confirmation page	As expected	Pass	
4/4/16			Twitter can be accessed from order confirmation page	As expected	Pass	
4/4/16			TTDB's Facebook/Twitter/Instagram can be accessed from About page	As expected	Pass	
4/4/16	11	<b>Catering Form Submission</b>	Catering tab takes user to the catering form page	As expected	Pass	
4/4/16			Form requires all fields to be filled and meets all criteria	As expected	Pass	
4/4/16			Form is submitted and emailed to company	As expected	Pass	
4/4/16	12	<b>Navigation</b>	All page navigation works	As expected	Pass	
4/4/16			All button input give an output	As expected	Pass	
4/4/16	13	<b>User Interface and Experience</b>	The background color is white	As expected	Pass	
4/4/16			The company color (#22B6E7) is used throughout	As expected	Pass	
4/4/16			Application has a consistent UI throughout	As expected	Pass	

# Appendix C: Tech Expo 2016 Poster

The following is the Tech Expo Poster for the Top This Donut Bar iOS mobile application.





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Lauren Marck, Timothy Menchen, Colton Zwissler • Technical Advisor: Professor Robin Carew • Expert Advisor: Jay Mason

### About

Top This Donut Bar gives people the opportunity to reimagine the traditional donut with a variety of mix-and-match toppings completely customized by you.

### Problem

Up to this point, the only thing standing between you and your perfect donut creation was a line of indecisive customers.

### Solution

By creating a mobile iOS application for online ordering, customers can finally let their creativity shine without the worry of waiting in line.

### Technical Elements



### Examples



The first screen upon launching the app is the first page of the Menu.

The screen that is displayed when a location is selected from the overall list.

### Acknowledgements

A special thanks to the Shelton's and Renfro's (TTDB), Professors Pat Kumpf and James Scott (UC), and our friends and family.

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University of Cincinnati • College of Education, Criminal Justice & Human Services • School of Information Technology

## **Appendix D: Project Experts**

The following are the project experts that have helped us in developing the Top This Donut Bar iOS mobile application.

- Lewis Riley – *Apple Products Specialist*
- Jay Mason – *Enterprise Systems Architect*