**Project CipherBridge**

**Unstoppable T-Rex Breathalyzer App, BASee**

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The purpose of this project was to design mobile app that would theoretically act as software for a cell phone breathalyzer prototype. Prototyping has included paper and software iterations of our group’s application. By the end of the project, our group has completed a Minimum Viable Product in the form of a mobile application that can run on Apple phones and tablets.

The value of this product is in the ease of measuring your blood alcohol level. The aim is to help inform consumers if it is currently safe for them to operate an automobile or another mode of transportation. Ideally, this will promote moderation when consuming alcohol and maintain a safe driving environment despite having consumed alcohol with a measure that can be trusted.

**Milestone 1**

**Idea Brainstorming.** To begin, our team created a [Storyboard](https://github.com/asu-cis-capstone/cipherbridge/blob/master/StoryBoard.pdf) to help us think through a typical situation in which our potential customers would use the app. Having identified some of the ways that consumers may use our application, we created a [Flow-Chart](https://github.com/asu-cis-capstone/cipherbridge/blob/master/Customer_Journey_Flowchart.png) walking through potential customers journey if they use or do not use our application. These activities helped our team think like our customers in order to understand their needs better. This resulted in the ideas to include informational descriptions of BAC levels, the ability to automatically call a taxi cab, and the need to make buttons and functions very large for consumers that are not in full possession of their mental faculties. Each of these have been posted to Github and are also available through the corresponding hyperlinks.

**Project Metrics and Planning.** To plan out our project, we first created a [Lean Canvas](https://github.com/asu-cis-capstone/cipherbridge/blob/master/Lean_Canvas.png) to help us put into words the specifics of the problem we want to solve, the solution, and the metrics we would use to measure success. To monitor our progress and verify that we were making improvements throughout the project, we identified and tested on two primary metrics:

1. The number of users willing to try our prototype.
2. The number of users willing to buy a completed version of the product.
3. Maintain 51% of users willing to buy a completed version of the product.

Lastly, we created a [Product Backlog](https://badge.waffle.io/asu-cis-capstone/cipherbridge.png?label=ready&title=Ready)%5d(https://waffle.io/asu-cis-capstone/cipherbridge) to identify tasks and plan out a rough schedule. All documents mentioned here have been made available on Github and through their corresponding hyperlinks.

**Sprint Review 1**

Having created some metrics that we thought we could use, we decided to create a [Survey on Google Forms](https://github.com/asu-cis-capstone/cipherbridge/blob/master/SurveyPowerpoint.pptx) to validate that we chose good metrics. The survey asked users seven questions to determine the viability of our concept and if there was demand for it. The first question asked about each user's’ background with drinking alcoholic beverages, the 2nd and 3rd questions asked about previous experience with breathalyzers, the 4th and 5th questions focused on the user story, and the 6th and 7th questions determined the likelihood users would consider using our product. In total, 32 people participated in the survey.

The first question we asked was “How often do you drink socially?” 28.1% answered “Often (more than once a week)”, 43.8% answered “Occasionally (once a week to a few times a month)”, and 28.1% answered “Rarely (less than once a month)”. From this, we inferred that there may be quite a few individuals that dink relatively often that may be curious about their BAC.

The 2nd question asked the user if they had ever used a breathalyzer for a non DUI reason. 68.7% answered no and 31.3% answered yes. This showed us that the majority of people we surveyed had never used a breathalyzer before.

The 3rd question asked the users that answered yes to the second question what the circumstances were in which they used a breathalyzer. Of the 10 responses to this question, 30% of them were asked by law enforcement and 70% of them were not related to law enforcement. From this, we determined that there are a fair number of users that use a breathalyzer for personal or recreational use.

The 4th question asked users if they ever wondered what their BAC was while drinking. 71.9% answered that they have and 28.1% answered that they have never wondered what their BAC was while drinking. With 71.9% of the respondents having wondered what their BAC was while drinking, and that only one third of all respondents have ever used a breathalyzer before; we became pretty confident that there was a potential market for breathalyzers in general.

The 5th question asked users if they have ever had to change plans because they did not want to drive impaired or potentially impaired. 56.3% answered yes and 43.8% answered no. With this information, we determined that there have been circumstances in which some of the respondents may have liked to have a breathalyzer to see if they could drive or not.

The 6th question asked the respondents if they would trust a BAC measurement provided by an application on their smartphones. 78.1% answered yes and 21.9% answered that they would not trust the BAC provided by their phone. This validated our theory that most users would trust our application if we measured their BAC level.

The last question directly asked the users if a phone application that measures Blood Alcohol Content of a plug in reader would be useful to them. 37.5% of the respondents answered yes, 25% answered no, and 37.5% did not know. With these numbers, we were able to verify that of the respondents we surveyed, there was indeed a large amount of them that were actively interested in a product with the capabilities of our project.

All in all, we determined that there is a niche market that would like to have a smartphone application that works in tandem with a plug in breathalyzer for personal use.

**Sprint Review 2**

Having obtained data showing that there was a market for our product, we began to create our [Initial Mockup Prototype](https://github.com/asu-cis-capstone/cipherbridge/blob/master/InitialMockupPowerpoint.pptx). For our first prototype; we thought through the basic structure and design of our application, BASee. Because none of our group members is particularly talented in drawing and design, we outsourced the design work to one of our acquaintances that is proficient with Adobe Photoshop. With their assistance, we designed the layout and created screenshots of our planned application in order to show the pictures to potential users and obtain empirical evidence and feedback.

Having completed the mockup prototype, [we went out and showed 23 individuals our prototype](https://prezi.com/q-z7zf_zwfx0/sprint-review-2/?utm_campaign=share&utm_medium=copy) and asked for feedback. Of the 23 users, 91% of them said they would be willing to either download the application or recommend it to a friend. 78% of the individuals said they would be willing to purchase the application if the price was reasonable. Also, 70% of them indicated that they would trust the BAC measurement while 17% of them would want to see additional research (such as a comparison with a law enforcement approved breathalyzer).

For feedback, two of the respondents mentioned that they had seen a similar idea on Shark Tank. Considering that this market exists, it is not too surprising to hear that there are other pursuing a phone based breathalyzer application. Additionally, the other feedback we obtained pertained to the length of our plug in prop. Some people liked that it was longer, citing that it was easier to hold and use; while others would prefer a much shorter plug in in order to be discreet and avoid drawing attention to the hardware.

**Sprint Review 3**

Using the structure, design, and feedback from the Initial Mockup Prototype, we began to build the first [Mobile Application Prototype](https://creator.ionic.io/share/841d7f02dd80) of BASee. We built the app using Ionic Creator to create a web version of the app that would also run on mobile. This prototype included a Homepage, Test Me, User Description, Call A Cab, Login,, and Contact pages. With the exception of the About page, all pages had the ability to display information, allow user input, select buttons, or run their own function. Throughout the entire application, the user had the ability to swipe right to bring over a menu showing all available pages within the app.

Of particular note, users were allowed to “Test Me” to see a mockup of the measurements if their BAC was below or above the legal limit to drive. They were also able to input their height, weight, and tolerance on the User Description page. By pressing Call A Cab in the menu, the application would automatically run a protocol that would bring up the phone number in your mobile device; allowing you to simply press Call to call for a taxi. This function is also available on the measurement page if the user was above the legal limit. While there is a Login page that allows users to input a username and password, the application is not connected to a database. So it will not store the information it is given.

After building the application, [we showed it to 15 people and asked for feedback](https://github.com/asu-cis-capstone/cipherbridge/blob/master/SprintReview3.pptx). Of the individuals we showed the application to, 86.6% of them were willing to try it and 60% of those individuals indicated that they would probably buy it if the price was reasonable. Other feedback we were given included the need make the testing button bigger on the Home page, legal disclaimers, and that it currently takes quite a few steps to get to the BAC measurement.

**Showcase and Final Prototype**

Using the information we had obtained throughout the Sprints and feedback we obtained, we created the [Final Prototype of BASee](https://github.com/asu-cis-capstone/cipherbridge/blob/master/BASee.zip). BASee was built primarily using Xcode, making it primarily for Apple based products such as Macs, iPads, and iPhones. While connecting the app to a hardware prototype was beyond the scope of our project plan, we did program the application to run a simulation of BAC measurement. The new features in the simulation included: an animated circular progress bar, the ability to display a BAC level, the ability to press a button that would display different information about your BAC level depending on if it was measured as high, medium, or low, and a slicker all around design.

To simulate the BAC measurement, when tested, the application would generate a random number below one, determine if the number was within the high, medium, or low category, display the number in either red, orange, or green, and generate a button that the user can press to learn more information about the effects of their current level of inebriation. Based on the feedback we received during the Showcase, many people thought that this was a very interesting idea and liked BASee. All materials created throughout this project are available on Github and the above hyperlinks all route to the specified documents, files, etc.