Athena Systems

by

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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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April 2020

ATHENA SYSTEMS

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ACRONYMS AND ABBREVIATIONS

SQL	Structured Query Language
SSL	Secure Sockets Layer
WBS	Work-breakdown Structure

ABSTRACT

According to a 2015 survey conducted by the Pew Research Center and published in a September 2016 Internet and Technology report, 52% of adults are relatively hesitant to use digital tools because of lower levels of digital skills and trust in the online environment. As technology has evolved to become an essential part of our modern everyday lives, it is important for end users to understand how to both utilize it effectively, and keep themselves and their data safe. From email to online banking, technology has introduced new ways to organize and manage our lives. However, it has also introduced new sets of risks and challenges never before faced by users. This is where Athena Systems can help. Athena Systems is a multi-platform web application that both protects and assists users with catching up to the functionality of modern technology. It provides interactive lessons and opportunities such as registering and collaborating with a community of Athena Systems users. The security tool also provided by Athena Systems allows users to cross check websites and domains for legitimacy by running them against a blacklist database. ***Stay smart and stay safe with Athena Systems.***

1. PROBLEM STATEMENT

1.1 Introduction

With all the advancements taking place today in many different technological areas within an average users' daily life, many people might find themselves overwhelmed with the amount of information that is thrown at them. From basic device usage, to securing valuable and confidential data, certain users might need a more centralized source of information that can serve as their stepping stone into the cyber world. In order to facilitate the information gathering and processing related to technology best practices and personal cyber security, a solution like Athena Systems is required to alleviate many of the inconveniences a user might find themselves facing.

1.2 Project Description

Using the Athena Systems web application, users will be able to use our main security tool which allows them to scan web addresses and email addresses to determine safety. Users will also be able to partake in interactive tutorials, and informative lessons and guides, that range from proper technology conduct to personal cyber safety. Users of Athena Systems will also have the ability to register and interact either by emailing our team or participating in a public forum filled with helpful discussions and problems/solutions provided by others.

1.3 Problem

As technology keeps advancing and getting more in depth, it has become hard for people to learn and understand the basics. This is particularly the case for the older demographic who have lived most of their lives without advanced technology, and the technologically illiterate who are unable to benefit from the power of modern-day technology simply because of how complex of an effort it is to comprehend basic tasks and processes. Based on our research, more of which is included below, we concluded that users who possess even the most basic computer knowledge are still not aware of how they can protect themselves in an increasingly technology-dependent world. We are determined to combine the core ideas of security and education into a tool that is available to everyone, everywhere.

1.4 Solution

As a group, we are going to orchestrate the production of a web application that focuses on security while also providing lessons, training, and overall guidance into general aspects of the technology field. This multi-platform web application will be accessible to users by simply opening up a web browser on their computers or mobile devices, and visiting the following web address: (athenasystems.technology). Athena Systems is a dynamic platform that aims to bridge the digital divide gap by utilizing the fundamental idea of *"Informing and Protecting"*.

Using the Athena Systems web application, users will be able to use our main security tool which allows them to scan web addresses and email addresses to determine safety. Users will also be able to partake in interactive tutorials, and informative lessons and guides, that range from proper technology conduct to personal cyber safety. Users of Athena Systems will also have the ability to register and interact either by emailing our team or participating in a public forum filled with helpful discussions and problems/solutions provided by others.

Our decision to pursue the idea of creating Athena Systems was taken after we had failed to come across any other available solutions that provided a security tool and interactive educational information, while also taking a tailored approach towards our target audience. The closest comparable products we could find consisted of websites and applications that were dedicated to only one of the aforementioned

features that Athena Systems provides. The remainder of this report outlines how the Athena Systems team plans on completing this project. The completed report will include different sections such as project design concepts/plans, objectives/goals, methodology/technical approach, schedule/timeline, problems encountered, and recommendations for improvement.

1.5 User Profiles

Table 1.1: Basic User Profile provides an overview of who the average Athena Systems will be. This user is the main target of our informative multi-platform application which aims to provide a seamless experience.

User Profile (Basic User) - Athena Systems
Application Athena Systems
Potential Users ● Older demographic ● Technologically illiterate
Software, Interface, and Related Experience Prospective users of Athena Systems will need a very basic level of technology experience that consists of actions such as opening a web browser and typing in a web address. It might also prove useful, but not necessary, if users have any previous experience with visiting interactive, educational websites or web applications on a computer and/or mobile device.
Experience with Similar Applications: A small percentage of Athena Systems' users may have minimal experience with websites that either offer, a) Security search tools to scan web or email addresses, or b) Interactive educational/informational experiences. Otherwise, Athena Systems is built solely for users that are not technologically savvy. The core design plan of this web application promises a seamless and easy-to-use experience for each and every user.
Task Experience ● Type in the following web address into a browser on a computer or mobile device: (https://athenasystems.technology/) ● Register and login as a user of the Athena Systems community. ● Engage in interactive and informational lessons. ● Scan web and email addresses to determine their safety.

Frequency of Use Users will be visiting the Athena Systems web application daily, sometimes even hourly. The security tool that is offered for users, in combination with the helpful lessons and the active social community, is vital for vulnerable users that are unsure of how to achieve a comfortable level of technology use and personal cyber security. Afterall, this is where the fundamental idea of *"Informing and Protecting"* comes into effect.
Key Project Design Requirements that the Profile Suggests ● Convenient and straightforward user interface. ● Aesthetically pleasing web design with clear navigation ● Simple layout for access on multiple platforms ● Concise instructions for an easy-to-use experience ● Uncomplicated feature access and engagement

Table 1.1: Basic User Profile

Table 1.2: Front-End Admin User Profile provides an overview of the application's front-end admin users. This user profile is aimed towards the Athena Systems front-end administration team.

User Profile (Front-End Admin) - Athena Systems
Application Athena Systems
Potential Users ● Administration Team (Development, Networking, Security)
Software, Interface, and Related Experience Admin users of Athena Systems will have experience that consists of system administration related to their respective roles on the front-end of the web application. This includes logging in to the application and the web server through the web server's admin portal in order to monitor, analyze, and solve issues related to user login, user interaction, and web application scripting features.
Experience with Similar Applications: - cPanel - Plesk - Webmin - VestaCP

Task Experience ● Use a web application on a browser of choice to login as an Athena Systems front-end admin ● Monitor, analyze, and solve issues related to front-end features such as user login, user interaction, and application scripting ● Communicate with other administration team members to correlate web application safety, operability, and availability efforts
Frequency of Use Front-end admin users will be visiting the Athena Systems web application daily to ensure the application is operating properly. Change in frequency of use is also dependent on whether or not there are critical issues to respond to.
Key Project Design Requirements that the Profile Suggests ● Ease of use for administration purposes ● Uncomplicated feature ● Responsive communication channels for team collaboration

Table 1.2: Front-End Admin User Profile

Table 1.3: Back-End Admin User Profile provides an overview of the application's back-end admin users. This user profile is aimed towards the Athena Systems back-end administration team.

User Profile (Back-End Admin) - Athena Systems
Application Athena Systems
Potential Users ● Administration Team (Development, Networking, Security) **Software, Interface, and Related Experience** Admin users of Athena Systems will have experience that consists of system administration related to their respective roles on the back end of the web application. This includes logging in to the application and the web server through the web server's admin portal in order to monitor, analyze, and solve issues related to account management/security and general application maintenance.

Task Experience ● Use a web application on a browser of choice to login as an Athena Systems back-end admin ● Monitor, analyze, and solve issues related to back-end features including account management/security and general application maintenance ● Communicate with other administration team members to correlate web application safety, operability, and availability efforts
Frequency of Use Back-end admin users will be visiting the Athena Systems web application daily to ensure application is operating properly, similar to front-end admins and their responsibilities. Change in frequency of use is also dependent on whether or not there are critical issues to respond to.
Key Project Design Requirements that the Profile Suggests ● Ease of use for administration purposes ● Uncomplicated feature access ● Responsive communication channels for team collaboration

Table 1.3: Back-End Admin User Profile

1.6 Use Case Diagram

Figure 1: Use Case Diagram illustrates all the potential users that will be interacting with the Athena Systems web application. Also displayed are the tasks that every user will be able to access, as well as the areas of responsibility for the admin user profiles.

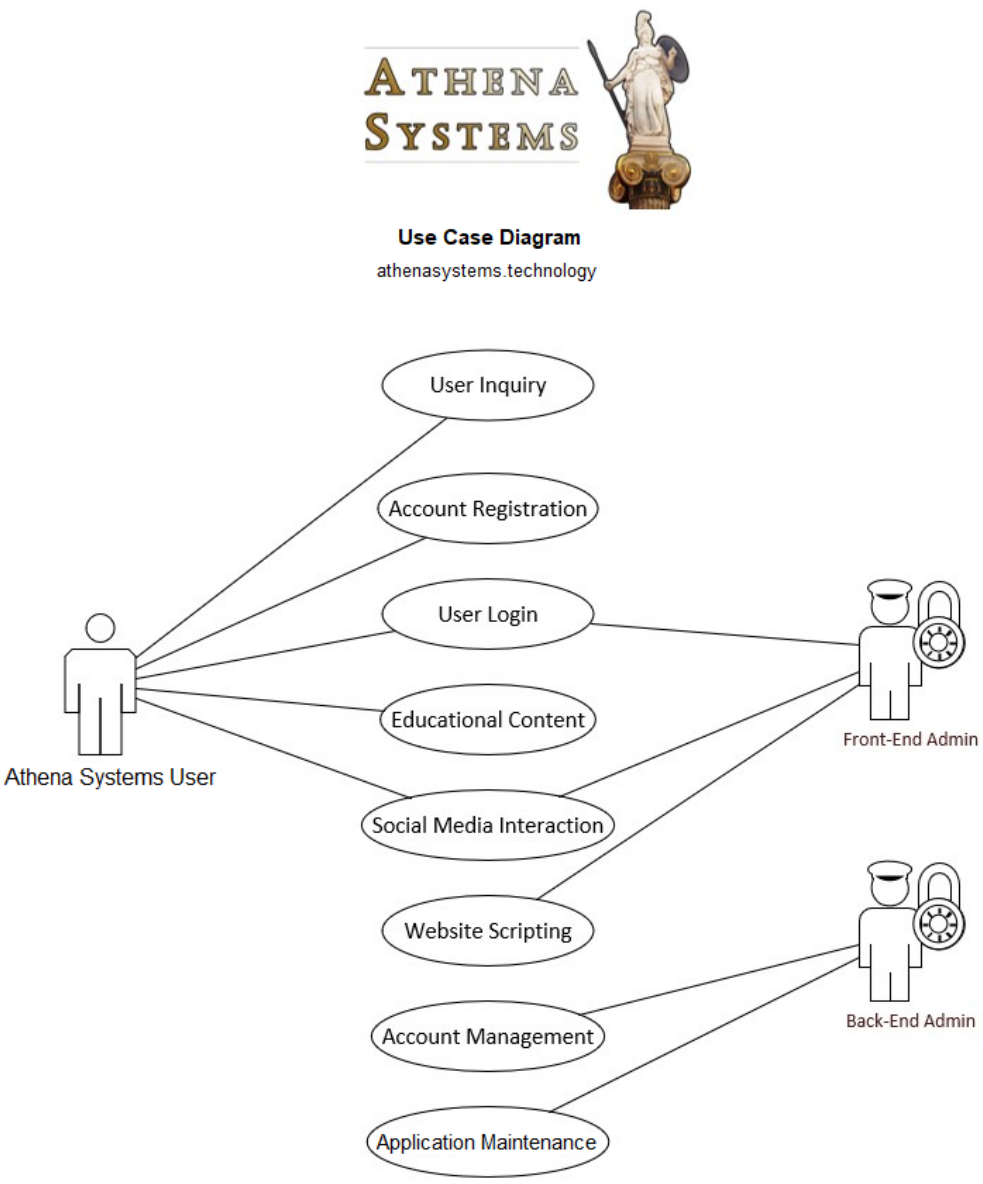


Figure 1: Use Case Diagram

2. PROJECT MANAGEMENT

2.1 Budget

Table 2: Project Budget provides detailed information about the budget that was determined for the project and its overall timeline. The determined workload consisted of 32 weeks of labor with an average of 15 hours per week from three separate workers, and 20 hours per week from one worker. A reasonable hourly estimate was determined to be $20 for each worker. The team consisted of one network architect, two security specialists, and one developer. Included in the budget is other miscellaneous expenses such as research, marketing, and operation costs.

Item	Hours/Count	Weeks	Price	Total Cost
Networking Labor	15 hrs./week	32 weeks	$20	$9,600
Security/Design Labor	15 hrs./week	32 weeks	$20	$9,600
Security/Development Labor	15 hrs./week	32 weeks	$20	$9,600
Development Labor	20 hrs./week	32 weeks	$20	$12,800
Research/Marketing	-	-	$65.92	$65.92
Domain Name	-	-	$8.57	$8.57
Security Suite	-	-	$54	$54
			Total	$41,728.49

Table 2: Project Budget

2.2 Objectives/Deliverables

Table 3: Project Work-breakdown Structure (WBS) lists the project's tasks and their timeline dates that are planned for the Fall and Spring semesters.

Task Name	Start Date	End Date
1. 0 Project Management & Deliverables	8/19/19	4/30/20
1.1 Team Building	8/19/19	8/22/19
1.2 Ideas & Brainstorming	8/22/19	8/24/19
1.3 Fall Semester Assignment 0: Team Members & Project Name	8/24/19	9/2/19
1.3.1 Project Name	9/2/19	9/7/19
1.4 Fall Assignment 1: Team Contract	9/8/19	9/23/19
1.4.1 Project Approval	9/2/19	9/23/19
1.4.2 Gantt Chart	9/9/19	9/13/19
1.4.3 Work Breakdown Structure	9/11/19	9/16/19
1.5 Fall Assignment 2: Project Abstract for Tech Expo	9/24/19	10/14/19
1.6 Fall Assignment 3: Team Contract Resubmission	9/24/19	10/14/19
1.7 3 - Minute Elevator Speech	10/14/19	10/22/19
1.8 Fall Assignment 4: User Profile	10/15/19	10/21/19
1.9 Fall Assignment 5: Use Case Diagram	10/15/19	10/21/19
1.10 Fall Assignment 6: Draft Report	10/22/19	11/4/19

1.11 Fall Assignment 7: Final Fall Semester Report	11/5/19	12/2/19
1.12 Spring Assignment 1: Testing Plan/Report	1/13/20	2/10/20
1.13 Spring Assignment 2: Abstract	2/11/20	2/17/20
1.14 Spring Assignment 3: Draft Tech Expo Poster	2/18/20	3/2/20
1.15 Spring Assignment 4: Final Poster	3/3/20	3/9/20
1.16 Spring Semester Presentation	3/10/20	3/30/20
1.17 IT Expo	1/21/20	4/14/20
1.18 Spring Assignment 5: Final Report	3/31/20	4/6/20
1.19 Spring Assignment 6: SafeAssign Final Report	3/31/20	4/6/20
1.20 Spring Assignment 7: Final Library Copy	4/7/20	4/29/20
2.0 Research	8/24/19	4/30/20
2.1 Create Facebook Ads	1/18/20	4/30/20
2.1.1 Analyze/Compile Research Results	1/18/20	2/29/20
2.2 Create Learning Modules	2/29/20	4/3/20
2.2.1 Write Lessons/Quizzes	2/29/20	3/14/20
2.2.2 Record Instructional Videos	3/14/20	4/3/20
3.0 System Design	10/10/19	4/6/20
3.1 Purchase Domain Name	10/10/19	10/10/19
3.2 Create System Diagrams	10/17/19	1/17/20

3.2.1 Create Database Design	10/17/19	1/17/20
3.3 Implement Website Checker	3/19/20	4/6/20
4.0 Environment Set-Up	2/7/20	2/9/20
4.1 Setup GitHub Repository	2/7/20	2/7/20
4.2 Setup Database Server	10/10/19	10/10/19
4.3 Setup Security Suite	2/7/20	2/9/20
4.3.1 Configure Web-Application Firewall	2/7/20	2/8/20
4.3.2 Configure Scheduled Malware Scanning	2/8/20	2/9/20
4.3.3 Configure Automated Health Checking	2/8/20	2/9/20
5.0 Development (Front-End/Back-End)	10/14/19	4/6/20
5.1 Create Pages and Main Components	10/14/19	4/6/20
5.1.1 User Interface	10/14/19	11/5/19
5.1.2 Security Tool	10/14/19	4/6/20
5.2 User Registration	10/14/19	11/5/19
6.0 Testing	1/13/20	4/6/20
6.1 Security Test	3/9/20	4/6/20
6.1.1 Vulnerability Scanning/Detection	3/9/20	4/6/20
6.1.2 Compile Results/Analysis	3/16/20	4/6/20
6.2 Application Test	3/23/20	4/6/20
6.2.1 User Test	3/23/20	4/6/20

Table 3: Project WBS

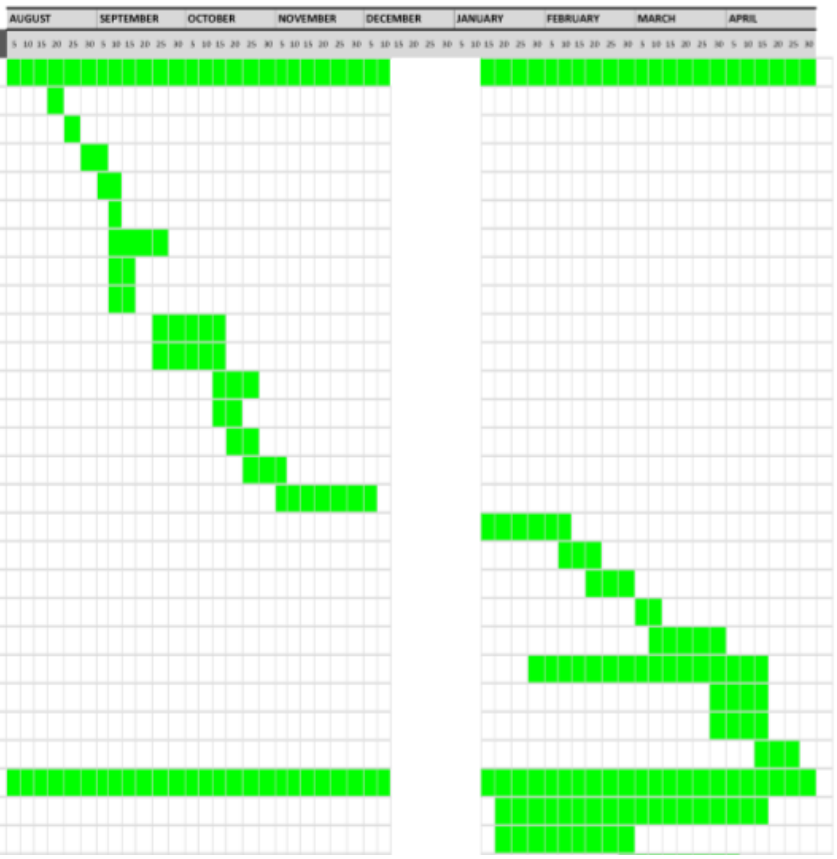
2.3 Project Schedule

Figure 2: Project Schedule and Gantt Chart displays our Fall and Spring semester schedule and the project's major milestones.

Athena Systems

Project Start: Mon, 8/19/2019

TASK	PROGRESS	START	END
1.0 Project Management & Deliverables	100%	8/19/19	4/30/20
1.1 Team Building	100%	8/19/19	8/22/19
1.2 Ideas & Brainstorming	100%	8/22/19	8/24/19
1.3 Fall Assignment 0: Team Members & Project Name	100%	8/24/19	9/2/19
1.3.1 Project Name	100%	9/2/19	9/7/19
1.4 Fall Assignment 1: Team Contract	100%	9/8/19	9/23/19
1.4.1 Project Approval	100%	9/2/19	9/23/19
1.4.2 Gantt Chart	100%	9/9/19	9/13/19
1.4.3 Work Breakdown Structure	100%	9/11/19	9/16/19
1.5 Fall Assignment 2: Project Abstract for Tech Expo	100%	9/24/19	10/14/19
1.6 Fall Assignment 3: Team Contract Resubmission	100%	9/24/19	10/14/19
1.7 3 - Minute Elevator Speech	100%	10/14/19	10/22/19
1.8 Fall Assignment 4: User Profile	100%	10/15/19	10/21/19
1.9 Fall Assignment 5: Use Case Diagram	100%	10/15/19	10/21/19
1.10 Fall Assignment 6: Draft Report	100%	10/22/19	11/4/19
1.11 Fall Assignment 7: Final Fall Semester Report	100%	11/5/19	12/2/19
1.12 Spring Assignment 1: Testing plan/report	100%	1/13/20	2/10/20
1.13 Spring Assignment 2: Abstract	100%	2/11/20	2/17/20
1.14 Spring Assignment 3: Draft Tech Expo Poster	100%	2/18/20	3/2/20
1.15 Spring Assignment 4: Final Poster	100%	3/3/20	3/9/20
1.16 Spring Semester Presentation	100%	3/10/20	3/30/20
1.17 IT Expo	100%	1/21/20	4/14/20
1.18 Spring Assignment 5: Final Report	100%	3/31/20	4/13/20
1.19 Spring Assignment 6: Safe Assign for Finale Report	100%	3/31/20	4/13/20
1.20 Spring Assignment 7: Final Library Copy	100%	4/13/20	4/27/20
2.0 Research	100%	8/24/19	4/30/20
2.1 Create Facebook Ads	100%	1/18/20	4/30/20
2.1.1 Analyze/Compile Research Results	100%	1/18/20	2/29/20



2.2 Create Learning Modules	100%	2/29/20	4/3/20
2.2.1 Write Lessons/Quizzes	100%	2/29/20	3/14/20
2.2.2 Record Instructional Videos	100%	3/14/20	4/3/20
3.0 System Design	100%	10/10/19	4/6/20
3.1 Purchase Domain Name	100%	10/10/19	10/10/19
3.2 Create System Diagrams	100%	10/17/19	1/17/19
3.2.1 Create Database Design	100%	10/17/19	1/17/19
3.3 Implement Website Checker	100%	3/19/20	4/6/20
4.0 Environment Set-Up	100%	2/7/20	2/9/20
4.1 Setup GitHub Repository	100%	2/7/20	2/7/20
4.2 Setup Database Server	100%	10/10/19	10/10/19
4.3 Setup Security Suite	100%	2/7/20	2/9/20
4.3.1 Configure Web-Application Firewall	100%	2/7/20	2/8/20
4.3.2 Configure Scheduled Malware Scanning	100%	2/8/20	2/9/20
4.3.3 Configure Automated Health Checking	100%	2/8/20	2/9/20
5.0 Development (Front-End/Back-End)	100%	10/14/19	4/6/20
5.1 Create Pages and Main Components	100%	10/14/19	4/6/2020
5.1.1 User Interface	100%	10/14/19	11/5/19
5.1.2 Security Tool	100%	10/14/19	4/6/20
5.2 User Registration	100%	10/14/19	11/5/19
6.0 Testing	100%	1/13/20	4/6/20
6.1 Security Test	100%	3/9/20	4/6/20
6.1.1 Vulnerability Scanning/Detection	100%	3/9/20	4/6/20
6.1.2 Compile Results/Analysis	100%	3/16/20	4/6/20
6.2 Application Test	100%	3/23/20	4/6/20
6.2.1 User Test	100%	3/23/20	4/6/20

Figure 2: Project Schedule and Gantt Chart

2.4 Problems Encountered and Solutions Analysis

Table 4: Problems Encountered and Solutions Analysis lists some notable issues that we faced during the duration of our project. Status and solutions related to the problems are also listed.

Problem Description	Solution Summary	Status
Initial deadline complication during first technical advisor meeting resulting from unmet expectations	**Planned multiple weekly meetings** to provide more opportunities to discuss and coordinate as a team	**RESOLVED**
Delay of progress when web server patching/upgrading took longer than expected	**Instantly resumed work** on different aspects of our project to meet deadlines	**RESOLVED**
Rescheduling deadline for creating login page and user registration feature due to unforeseen circumstances	**Managing extra workload** by dedicating additional hours to project	**RESOLVED**

Table 3: Problems Encountered and Solutions Analysis

One initial goal that we had to abandon was related to the security tool, a core feature of our web application. We had to redesign the security tool idea in order to reach the specific deadline that was set for this feature to be completed. The original idea was to have a security tool that searched both blacklisted websites and email domains. But due to some constraints, we were not able to adequately implement the email domain part of the security tool, and after a series of team meetings/discussions, we ended up with having a security tool that was capable of validating the safety of websites that users entered.

3. TECHNICAL ELEMENTS

3.1 Network

Over the course of working on Athena Systems, several major security upgrades were implemented to the web server which include following:

-CentOS 6 --> CentOS 7.7 with load averages 0.07 0.05 0.17

-cPanel updated to virtuozzo v84.0.7

-MySQL updated to latest version (Maria)

-cpsrvd 11.82.0.17

-Database client version: libmysql - 5.6.43

-PHP extension: mysqli, cur, mbstring

-PHP version 5.5 --> 7.2.7

This is to show that the web server for Athena Systems now has the latest security and performance updates for excellent performance of the web application.

12.1.2019 Updates:

-CentOS 7.7 Virtuozzo with load averages 0.18 0.16 0.10

-cPanel updated to v84.0.15

-Web Server – cpsrvd 11.82.0.17 11.84.0.15

-PHP version 7.2.7 7.3.6

-phpMyAdmin 4.9.0.1

-Comodo SSL is now cPanel Inc. – Functionality is the same

Figure 3: Application cPanel Inc. SSL Details displays in-depth information about the status of the SSL certificate.

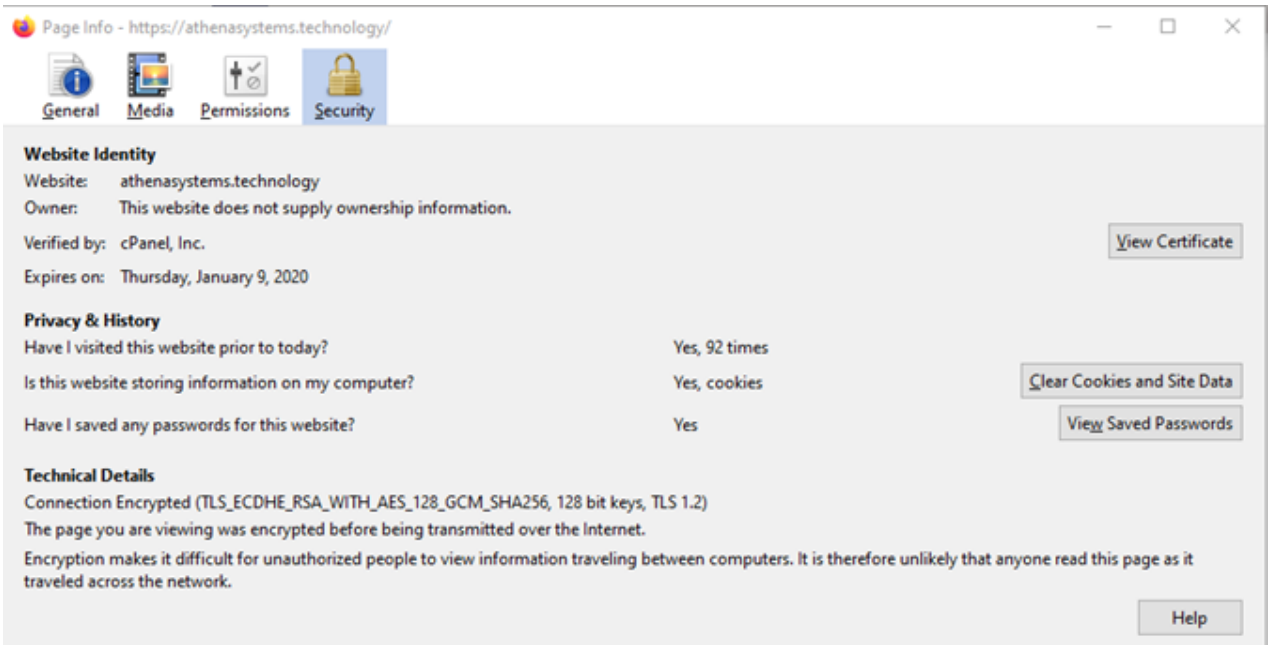


Figure 3: Application cPanel Inc. SSL Details

3.2 Application

The front end of this application will implement AngularJS and a Bootstrap HTML theme. HTML/CSS were chosen primarily due to their flexible and dynamic nature, allowing for two-way data binding between the front and back ends of the application. This will reduce the burden on our server.

BCrypt was chosen for the encryption of our users' passwords as they are uploaded to the database, and Javascript is the programming language to be used for this application.

3.3 Database

Users have the ability to create their own account so they can favorite or comment on the different features. All the information from their basic personal information to which tutorials they visit the most gets saved into a database that we access through cPanel. The data from the database will be used to produce different diagrams and we will be using SQL to pull the data.

3.4 Security

The SQL database, which will contain user information, and other information that is stored, will follow cyber security best practices related to different concepts such as information encryption, user privileges, data management, etc. in order to ensure the safety of Athena Systems' users and maintain the integrity of our application.

The Athena Systems web application, and the web server hosting it, are constantly being monitored for the latest security patches, data backup, and overall safety processes. Furthermore, the web-based application is secured with cPanel Inc. (Formerly Comodo) SSL certificates to ensure all user transactions are secure.

Our cyber security team will be consulting with our development and networking team members during the pen-testing and vulnerability scanning/detection phase, which will see the use of additional website/application security tools such as ASTRA security, and different pen-testing/vulnerability scanning/detection tools.

Figure 4: Web Application Firewall (WAF) displays the ASTRA security suite firewall dashboard that is monitored daily for security threats and vulnerabilities.

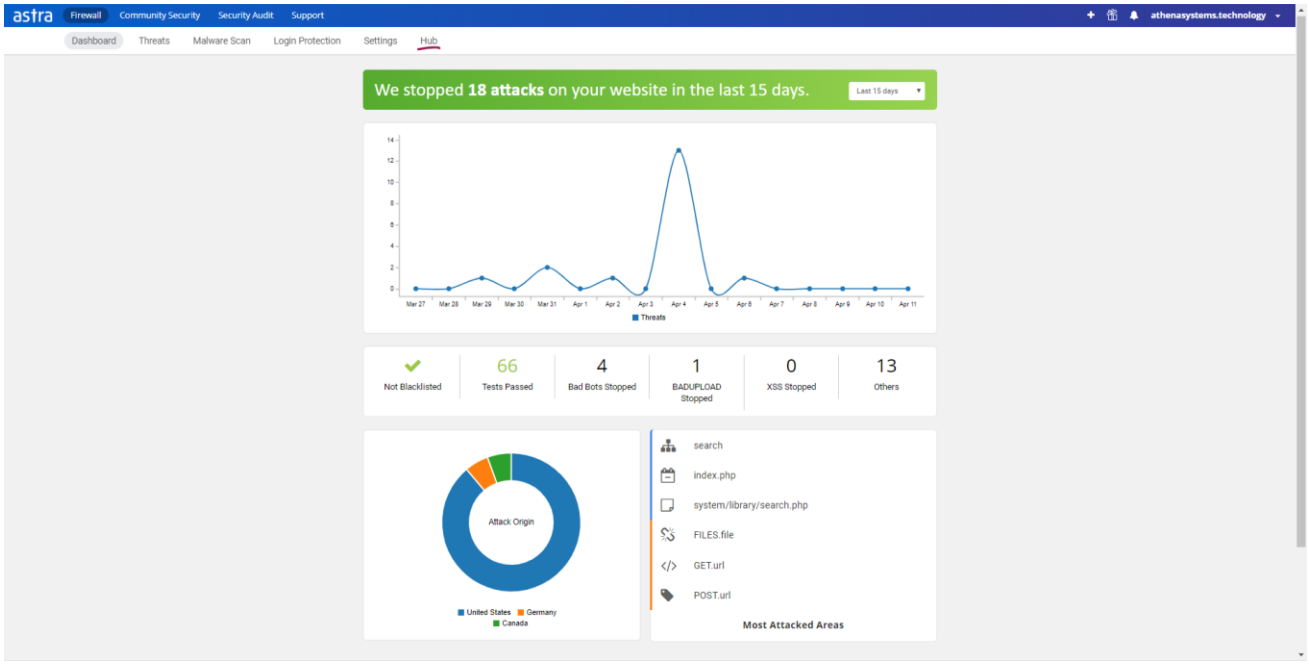


Figure 4: Web Application Firewall

4. TECHNICAL DIAGRAMS

4.1 Application Architecture

Figure 5: Technical Architecture Diagram displays the security, front-end, back-end, host environment, and data source aspects that make up the application's architecture.

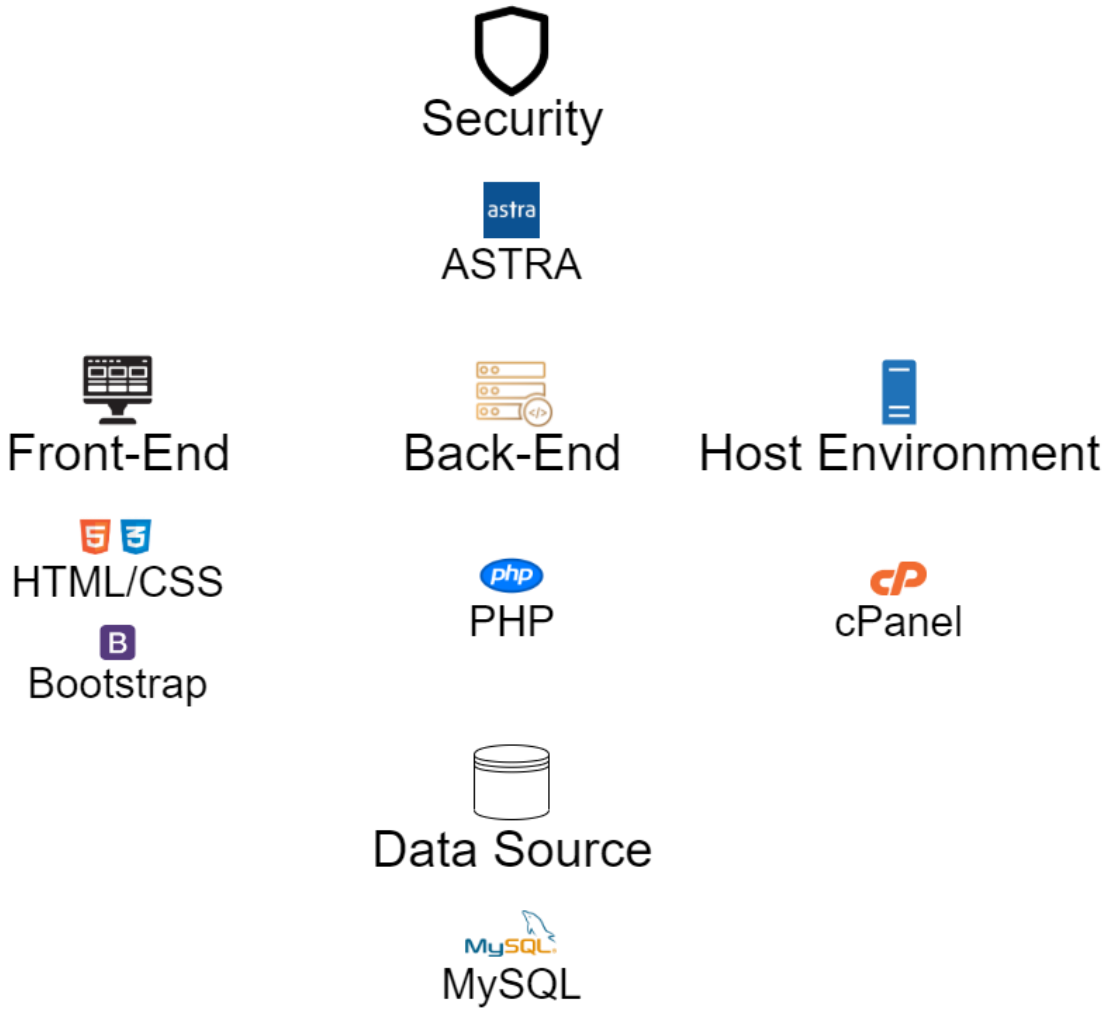


Figure 5: Technical Architecture Diagram

4.2 Screenshots and Examples

The following screenshots provide work-in-progress examples of the different pages of our web application.

4.2.1 Login Page View

Figure 6: Athena Systems Login Page displays the application's login page where pre-existing users enter their credentials.

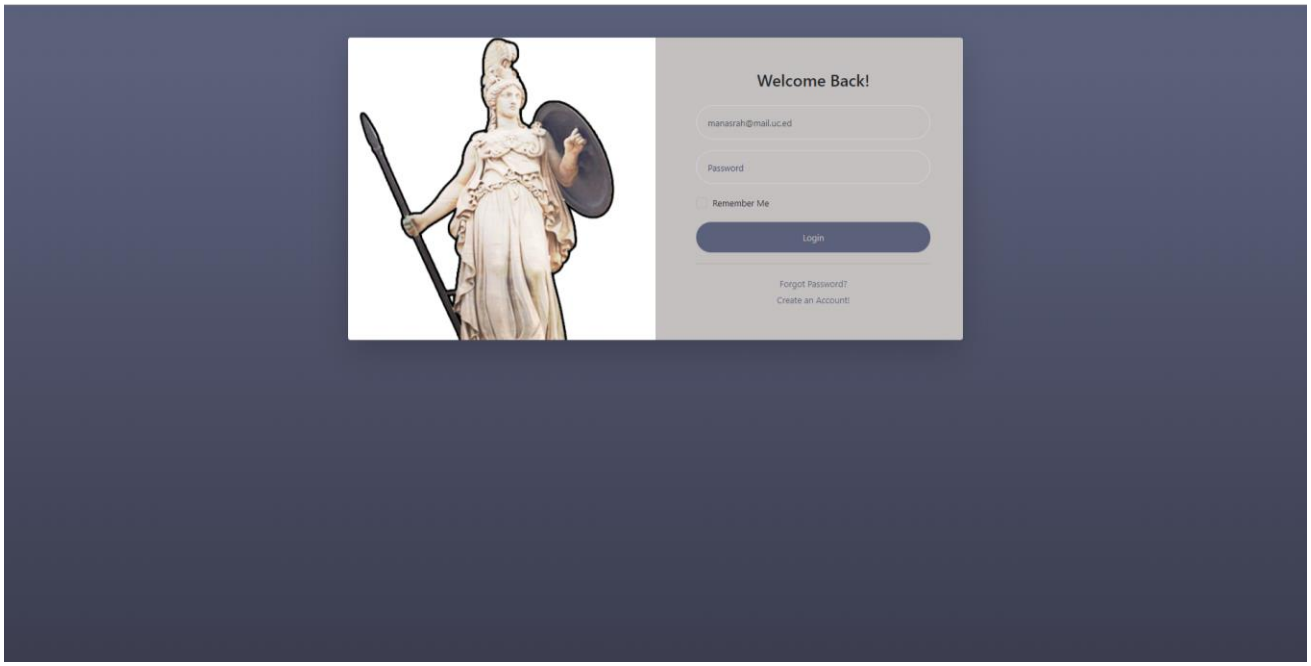


Figure 6: Athena Systems Login Page

4.2.2 **Homepage View**

Figure 7: Athena Systems Homepage displays the application's homepage that visitors will be greeted to.

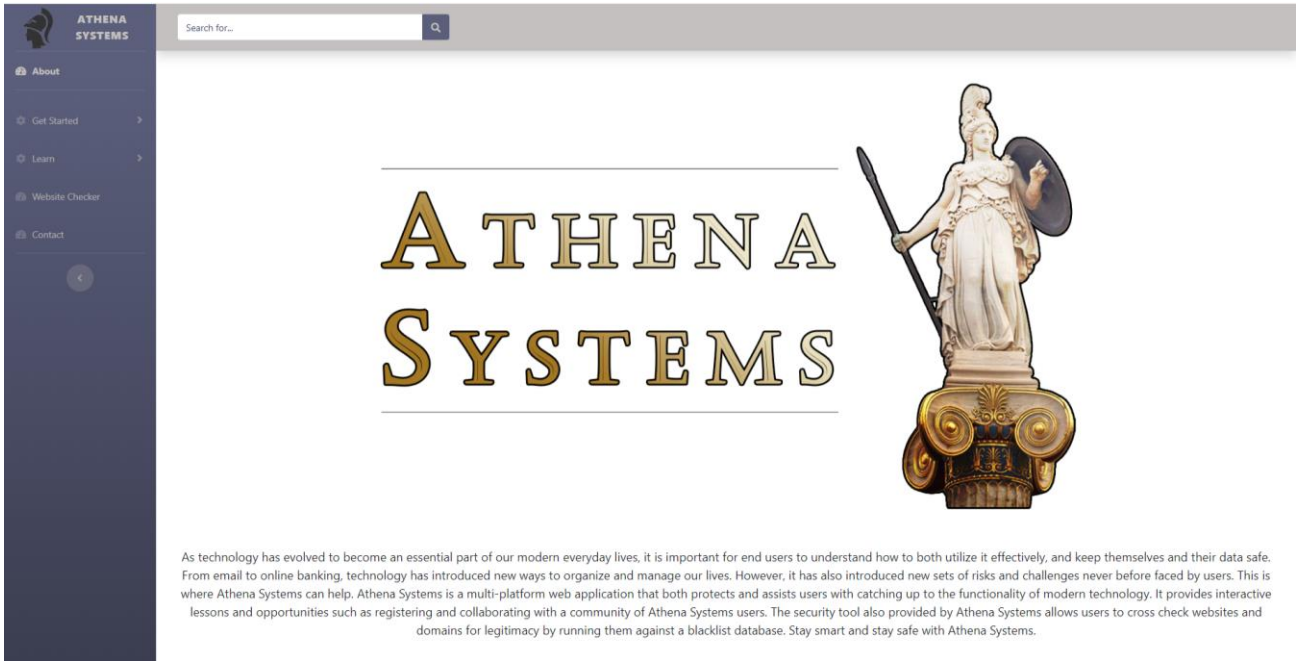


Figure 7: Athena Systems Homepage

4.2.3 **Registration Page View**

Figure 8: Athena Systems Registration Page displays the application's registration page where new users can create an account.

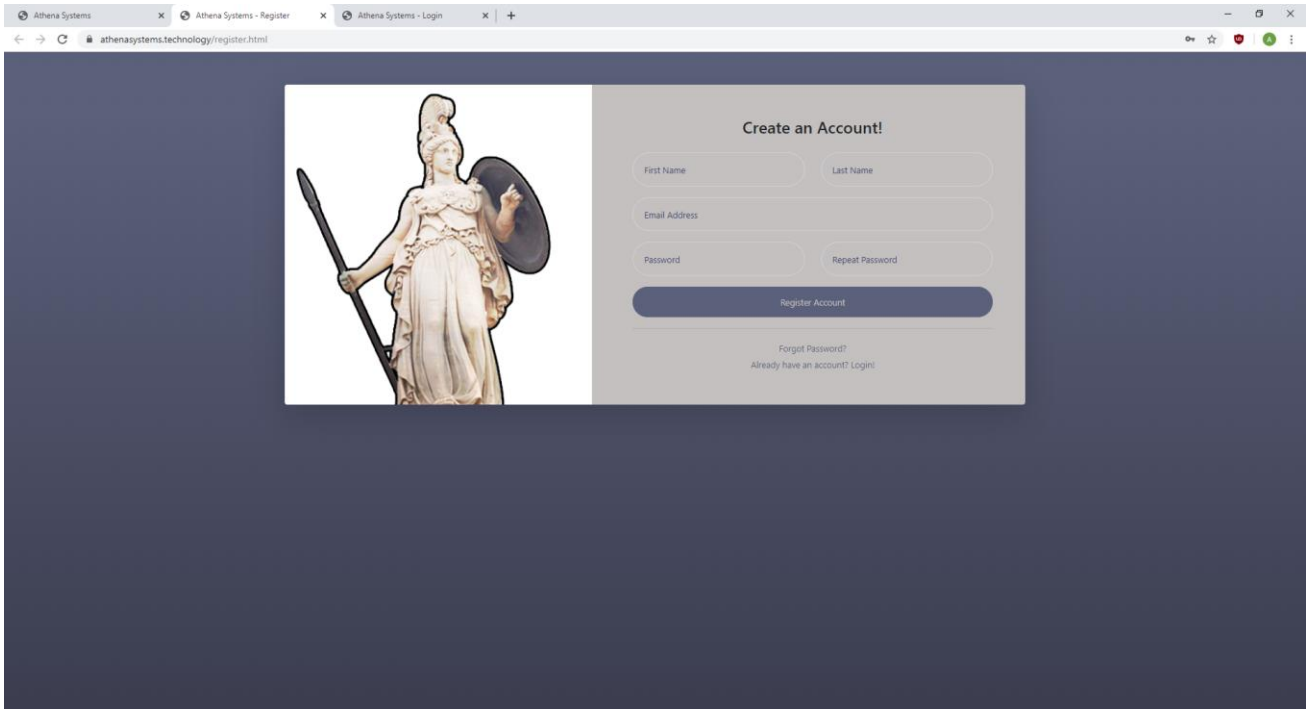


Figure 8: Athena Systems Registration Page

4.2.4 **Website Checker View**

Figure 9: Athena Systems Website Checker displays the security tool, a core feature of the application, where a user can validate the safety of a website.

Figure 9: *Athena Systems* Website Checker

5. TEST PLAN/RESULTS

5.1 Overview

The testing methodology for our application and the overall testing strategy will be based on Manual testing.

Essential features will have relevant Test Cases developed and the testing process documented.

Manual testing of essential feature Test Cases will initially take place by developers. Subsequent run-throughs by team members and end users will then occur.

Table 5: Test Case Example displays a sample Test Case for a user reaching the home/about page, how they can do that, and what should be expected.

Test Case	Steps	Expected Outcome	Results
User reaching Home/About page	I. User types in the URL for “athenasystems.technology” and hits enter, or clicks “About” from the sidebar.	I. User is directed to the Home/About page.	**Pass** **or** **Fail**

Table 5: *Test Case Example*

The developed test cases will cover all essential Athena Systems end user roles’ (Athena Systems User and Administrator) requirements for visiting and registering/logging into the application, navigating through the different available pages and menus, and experiencing the educational/informational and practical features of the application. User experience and user interface requirements are also included alongside application logic to test for functionality and effectiveness.

5.2 Objective

The objectives for testing application features are the following:

1. Test Cases composed pertain to essential features of the application.
2. Essential features will be tested according to end user roles (Athena Systems User and Administrator) requirements.
3. Results of Test Cases will be documented and shared with the appropriate parties.
    a. Both pass/fail conditions will be recorded, and any imperative information will be included.
4. Test Cases that have “failed” will be brought to developers responsible for certain aspects of the application and reviewed.
5. Features of reviewed Test Cases that have “failed” will be marked as “requiring a fix” and a plan will be documented/discussed.
6. Features and issues of “failed” Test Cases will be worked on and fixed by the assigned deadline.
7. Fixes for features of “failed” Test Cases will be deployed to production.

5.3 Test Cases

The test cases developed around functionality and effectiveness of the application components, as well as meeting project requirements, are the following:

1. Home/About page
    a. Steps:

i. User types in the URL for athenasystems.technology and hits enter, or clicks about from the sidebar.

b. Expected outcome:

i. User is directed to the home/about page.

2. User registration

a. Steps:

i. User clicks on the ‘sign up’ link from the sidebar menu.

ii. User enters required information (first name, last name, email, password).

iii. User clicks submit.

b. Expected outcome:

i. Registration form will be checked for completeness, including two matching password entries.

ii. The database will be checked for the entered email already being in use.

iii. Considering there are no errors, user’s information will be added to the database.

iv. User will be redirected to the login screen.

3. User dashboard

a. Steps:

i. User clicks on the ‘login’ link from the sidebar menu.

ii. User enters required information (email, password).

iii. User clicks submit.

b. Expected outcome:
    i. Successfully signed in users will be redirected to their user dashboard.
    ii. Users not logged in will be redirected to the login screen, and unable to access the dashboard.

4. Learning Modules
    a. Steps:
        i. User clicks on the ‘learn’ link from the sidebar menu.
        ii. User selects what module they would like to view.
    b. Expected outcome:
        i. User is redirected to their requested module.
5. Quizzes
    a. Steps:
        i. User clicks on the ‘quizzes’ link from the sidebar menu.
        ii. User selects what quiz they would like to take.
        iii. User inputs answers to displayed questions.
        iv. User submits answers.
    b. Expected outcome:
        i. User will be redirected to the quizzes page.
        ii. User will be given feedback for submitted answers.
6. Achievements
    a. Steps:
        i. User completes certain conditions for unlocking an achievement.
    b. Expected outcome:

i. User will be sent an alert that they have unlocked an achievement, and it will be reflected on their achievements page.

7. Website checker
    a. Steps:
        i. User inputs a URL for a website and clicks submit.
    b. Expected outcome:
        i. User will be shown whether the site is safe or unsafe.

Table 6: Test Suite Example displays an example of a collection of Test Cases and their descriptions, that have been developed for essential features of the application.

Test Case Title	Description
Home/About Page	User reaching Home/About page
User Registration	User registering on application
User Dashboard	User accessing their dashboard

Table 6: *Test Suite Example*

5.4 Results

Testing essential features took place when development of said features' Test Cases and application code was complete. This testing process allowed us to take notes and mark issues that required fixes in order to pursue pushing a feature to production.

Tables 7-13: Project Test Cases display examples of Test Case results and a general explanation of what occurred during specific cases of the testing process.

Test Case	Steps	Expected Outcome	Results

User registration	I. User enters registration information and submits it	I. Information will be uploaded to the database	**Fail**

Table 7: *User Registration Test 1*

First attempts at user registration failed. Connection to the database failed initially, but was fixed after adjusting the main PHP file.

Test Case	Steps	Expected Outcome	Results
User registration	I. User enters registration information and submits it	I. Information will be uploaded to the database	**Pass**

Table 8: *User Registration Test 2*

When successfully connected to the database, information from the registration form was collected with the POST method and put into the Users database via an INSERT statement.

Test Case	Steps	Expected Outcome	Results
Password encryption	User enters their desired password	Password is encrypted upon insertion into the database	**Pass**

Table 9: *Password Encryption Test*

Test Case	Steps	Expected Outcome	Results
Home/About page	User clicks on the ‘about’ link from the sidebar	User is redirected to the about page	**Pass**

Table 10: *Home/About Test*

Test Case	Steps	Expected Outcome	Results

User login	User enters their email and password in the login page and clicks submit	User is logged into their account and given a session	**Pass**

Table 11: *User Login Test*

Test Case	Steps	Expected Outcome	Results
Dashboard security	User tries to access dashboard without being logged in	User is redirected to the login screen	**Pass**

Table 12: *Dashboard Security Test*

Test Case	Steps	Expected Outcome	Results
Registration form validation	Information is missing from the registration form and submit is clicked	User will be redirected back to the registration page with an error for what needs to be entered	**Pass**

Table 13: *Registration Form Validation Test*

5.5 Lessons

Manual testing of essential features and their functionality and effectiveness enabled the team to have an in-depth look into the code and whether or not it achieved the requirements set forth for the application.

Due to our knowledge of what exactly was specified for our application, manual testing enabled the team to prioritize certain tasks and push them to production in order to move onto other issues that were presented. Therefore, the application showed signs of progression and success in terms of fixing/completing and marking off items from our project requirements which will boost overall confidence.

Having different members/users test developers' features and overall code during the testing process also presented an opportunity to have different inputs/results that factored into the fixing or deploying of features.

6. CONCLUSION

6.1 Fall Semester 2019

The main focus, objectives, and progress regarding this project for the Fall semester was dedicated to researching the features we wanted to include in our web application, and more importantly, how we were going to implement them. We wanted to know how we will be able to pool together all of our knowledge in different areas to create a product that incorporated development, networking, and cyber security aspects. At first, our goal was to create an informational/educational website, but then we decided to create a unique product that included our initial idea and more. After more thorough research and discussion, we decided to also implement a security tool that greatly assists and allows our users to check web addresses or email addresses to determine if they are safe/trusted or part of a malicious operation.

6.2 Spring Semester 2020

The progress that took place in the Spring semester of this project's timeline was incredible. After careful planning, outlining, and delegation of responsibilities in the Fall semester, the team put forth extreme effort in the Spring semester in preparation to meet deadlines. Communication, coordination, and technical knowledge were at an all-time high considering that in the Fall semester, every team member set out to further research the different concepts that would eventually create our web application.

The main focus of this semester was to implement the core features that were outlined in the project requirements. We repeatedly stressed the fact that we needed to have functional web pages and features, and then we would work on polishing them

before the IT Expo. Overall, we were able to make the deadlines on our requirements through continuous meetings and dedicating months of work to the application. We are very proud of the final result, and most importantly, we hope that Athena Systems can positively impact our target audience and make a difference in this technology-dependent age where cyber threats are always present.

6.3 Recommendations for Improvement

As it is very well known, there will always be room for improvement. If our team were to do this project all over again, or if we had additional time to work on the project, there will always be some things (Minor or major) that could be tweaked for better results.

Going into this project with a more fundamental understanding of certain technical concepts would definitely be helpful, especially if they are related to the project idea being pursued. Doing this would give the team more time on successfully implementing/configuring a feature or piece of hardware/software rather than spending a significant amount of time learning how to implement/configure something during the project.

Furthermore, it is important that the team sets out realistic deadlines related to major milestones throughout the timeline of a project. It is very understandable if a certain step in a project requires more focus/time, and that should be realistically planned for. But remember, project milestones need to be completed by their deadlines so that the whole project can be completed by its deadline without any delay.

APPENDIX A. TECH EXPO

Tech Expo Poster

Figure 10: Tech Expo Poster displays the project's final poster that will be displayed during the IT Expo 2020 event.

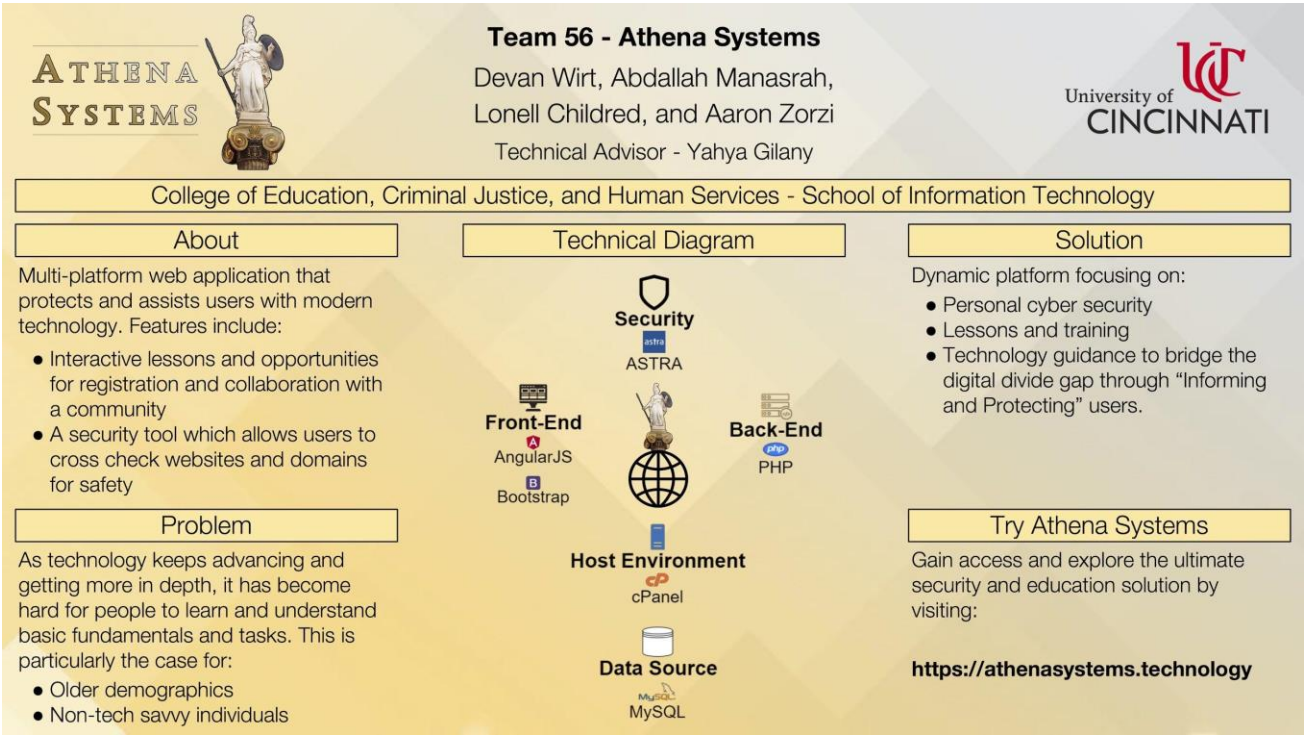


Figure 10: Tech Expo Poster

APPENDIX B. RESEARCH

Facebook Research

Exceptional research was conducted on the project's Facebook page (https://www.facebook.com/Athena-UC-Research-108432977423156/) as shown in ***Figure 11: Project Facebook Group***.

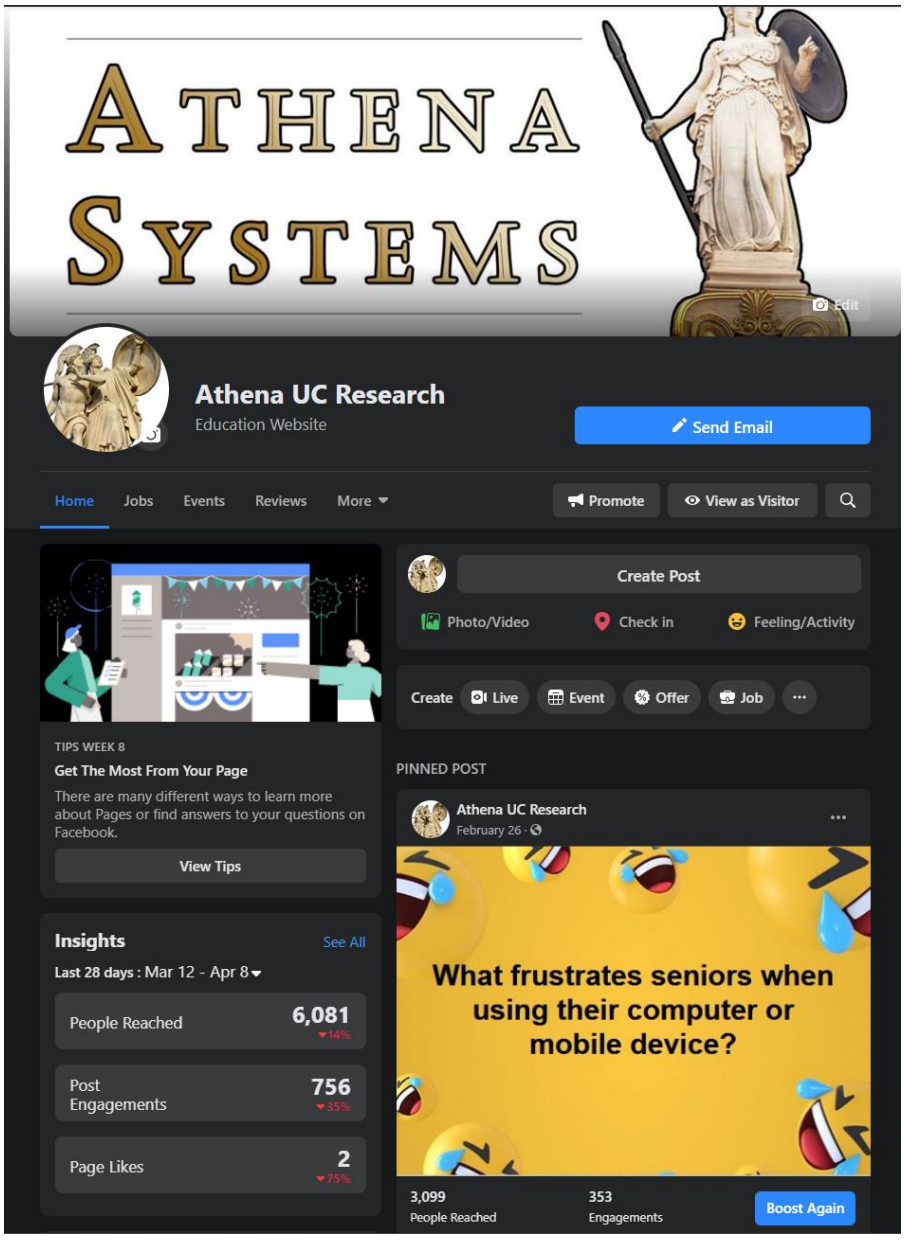


Figure 11: Project Facebook Group

A series of two advertisements/surveys were conducted as shown in ***Figures 12 and 13: Advertisement Examples*** to gather research data and stats.

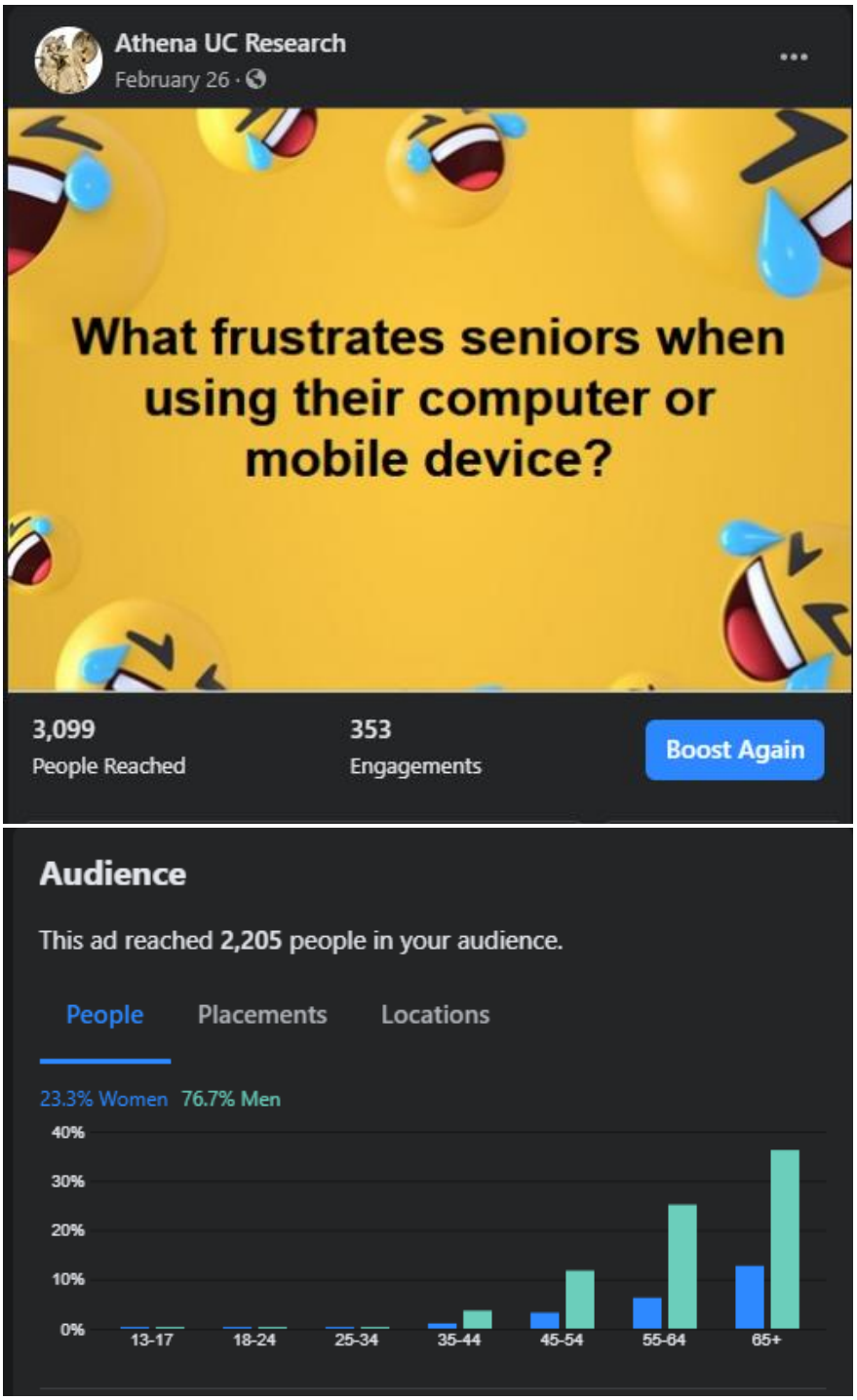


Figure 12: Advertisement Example 1

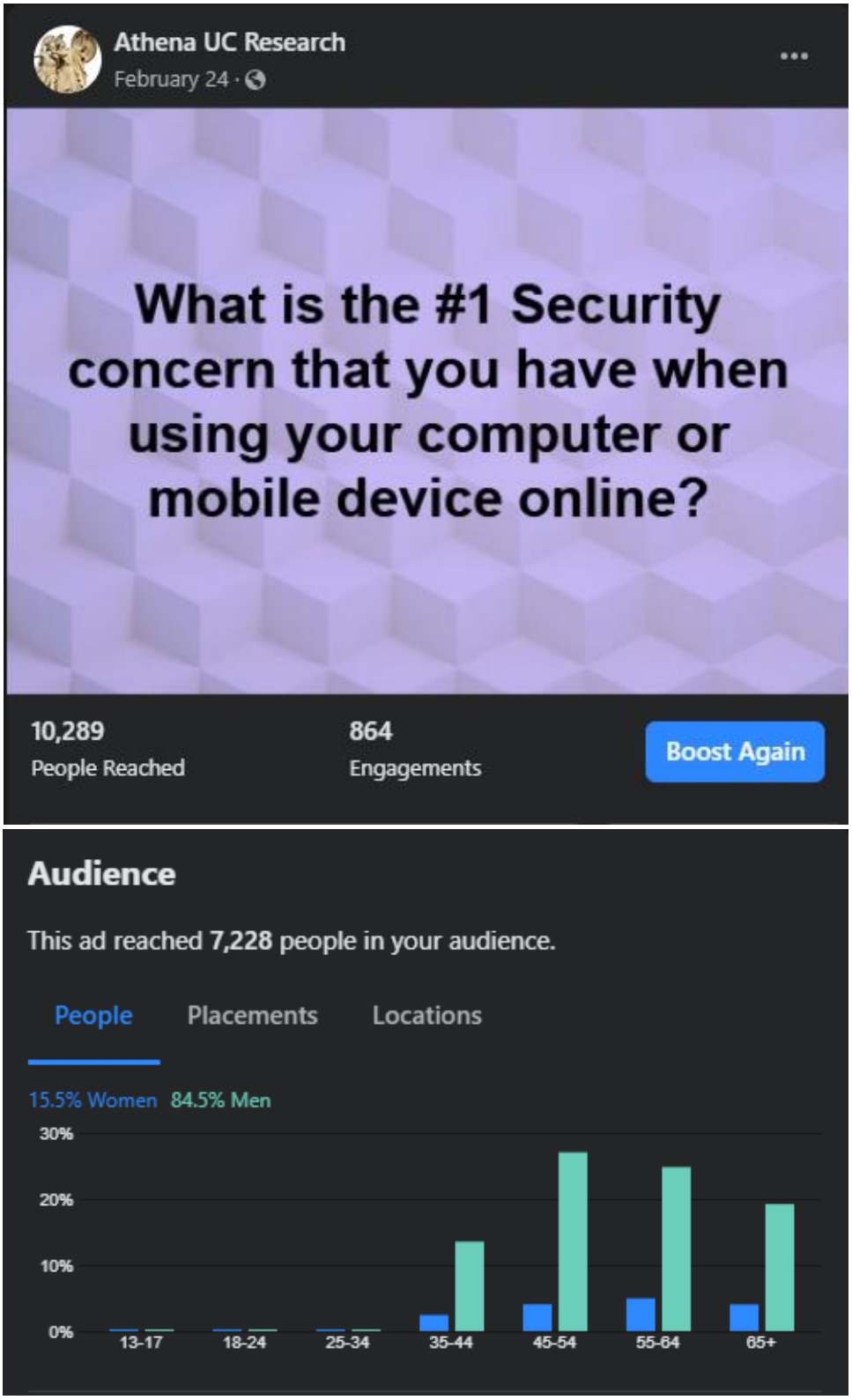
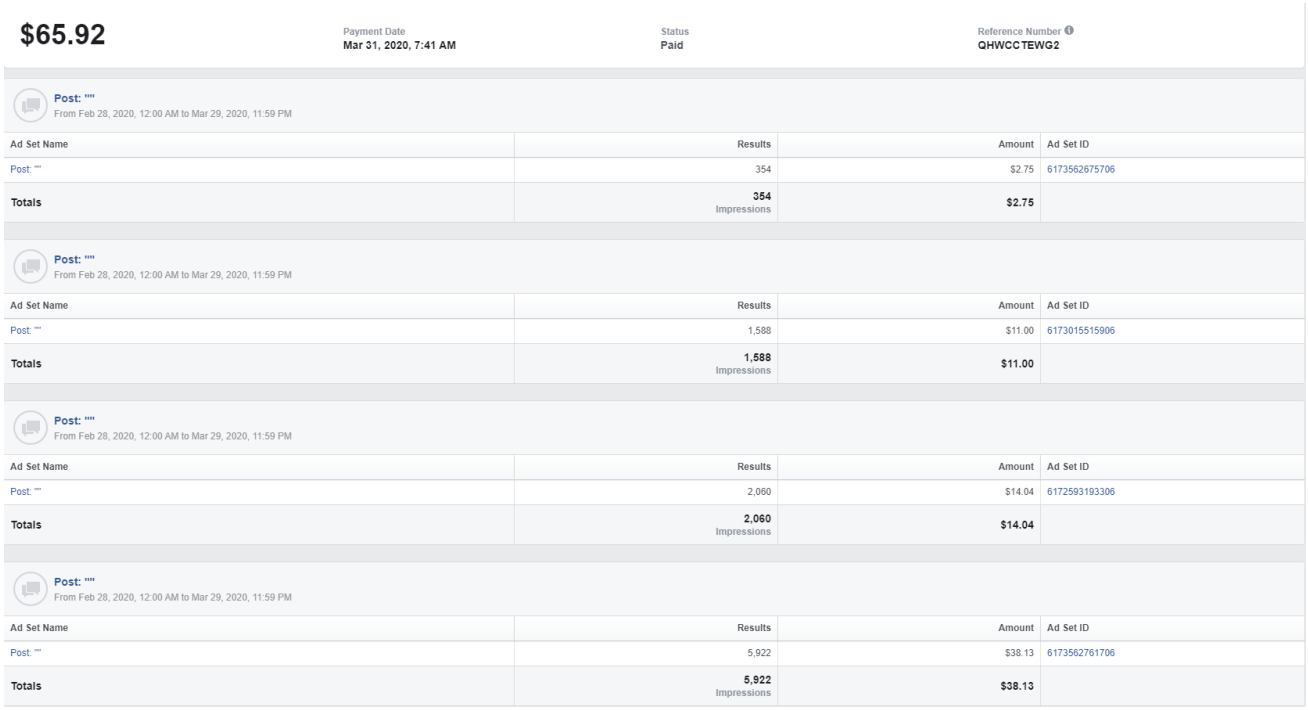


Figure 13: Advertisement Example 2

d

Research expenses, which will be included in the project budget, are displayed in ***Figure 14: Research Expenses*** to give a brief idea of the effort that was centered around acquiring input from the project's target audience.



$65.92

Payment Date: Mar 31, 2020, 7:41 AM | Status: Paid | Reference Number: QHWCCTEWG2

Post: """
From Feb 28, 2020, 12:00 AM to Mar 29, 2020, 11:59 PM

Ad Set Name	Results	Amount	Ad Set ID
Post: """	354	$2.75	6173562675706
Totals	**354** Impressions	**$2.75**	

Post: """
From Feb 28, 2020, 12:00 AM to Mar 29, 2020, 11:59 PM

Ad Set Name	Results	Amount	Ad Set ID
Post: """	1,588	$11.00	6173015515906
Totals	**1,588** Impressions	**$11.00**	

Post: """
From Feb 28, 2020, 12:00 AM to Mar 29, 2020, 11:59 PM

Ad Set Name	Results	Amount	Ad Set ID
Post: """	2,060	$14.04	6172593193306
Totals	**2,060** Impressions	**$14.04**	

Post: """
From Feb 28, 2020, 12:00 AM to Mar 29, 2020, 11:59 PM

Ad Set Name	Results	Amount	Ad Set ID
Post: """	5,922	$38.13	6173562761706
Totals	**5,922** Impressions	**$38.13**	

Figure 14: Research Expenses

APPENDIX C. REFERENCES

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