MICHIGAN STATE UNIVERSITY

09/26: Design Day Booklet Production Process

The Capstone Experience

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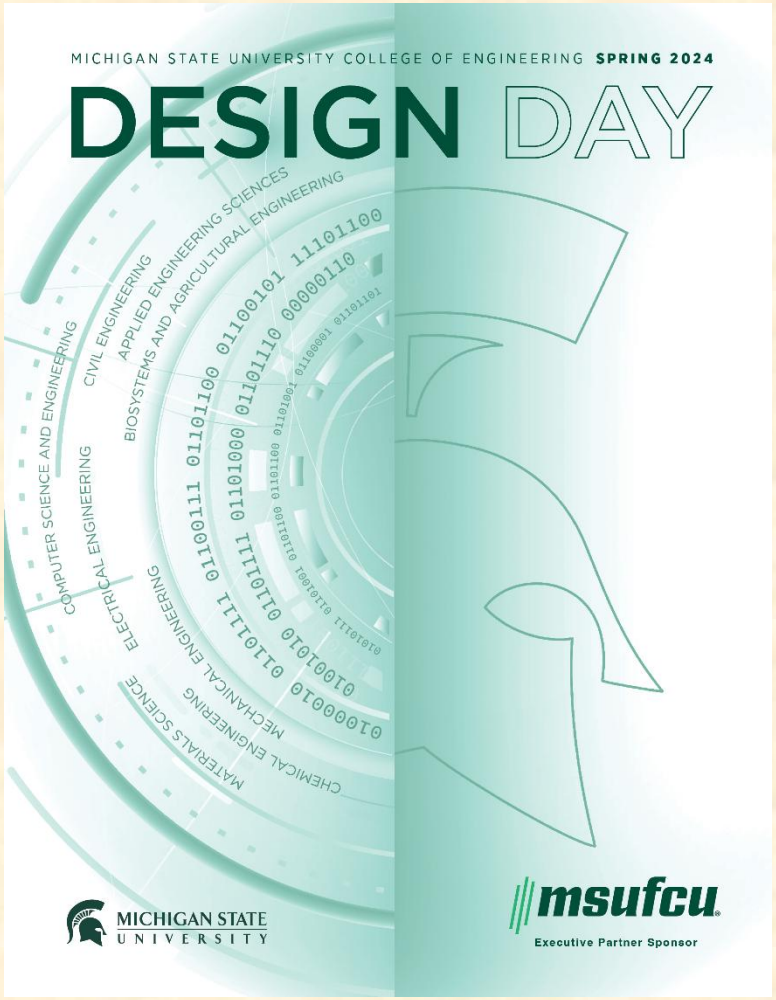
Michigan State University

Fall 2024

From Students…
…to Professionals

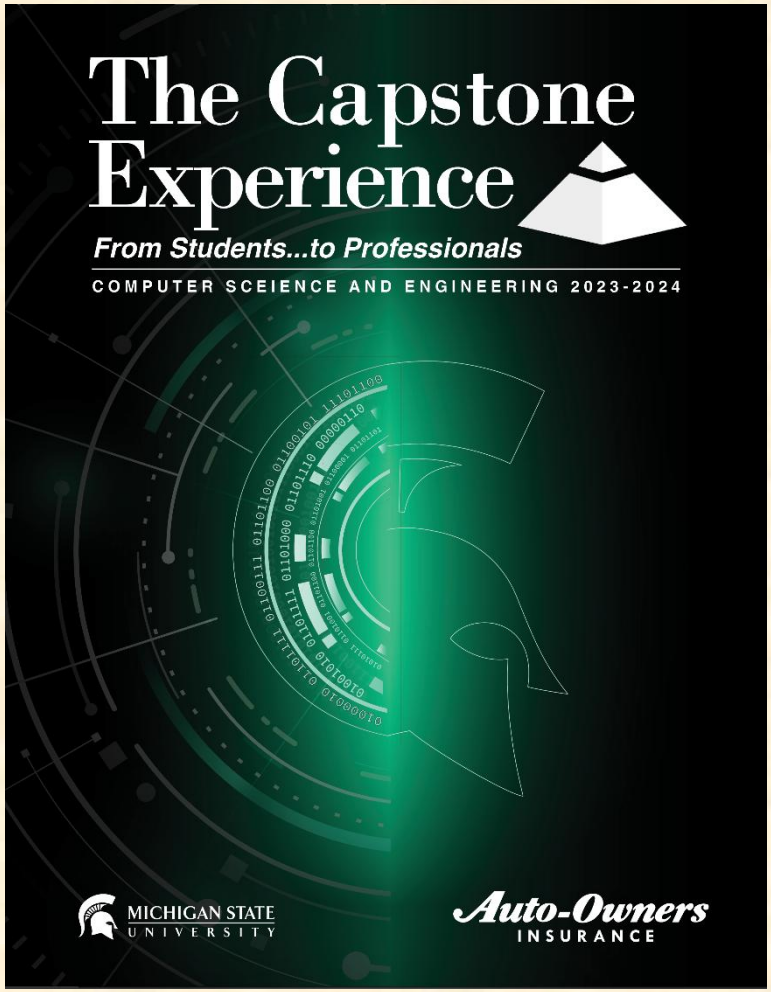
Design Day Booklet

- Professional Publication
  - Corporate Relations
  - Alumni Relations
  - Recruiting
  - Keepsake for You
- Contents
  - Schedule of Events
  - Project Descriptions



The Capstone Experience

- Professional Publication
  - Corporate Relations
  - Alumni Relations
  - Recruiting
- Contents
  - Capstone Projects
  - Academic Year



Team Project Page

- Template Distributed by Dr. D.
  - Sponsor's "Official" Name
  - Sponsor Logo
  - Project Title
  - MSU Team Photo
  - MSU Team Members' Names
  - Corporate Sponsors' Names
  - Headers and Footers
  - Posted On Downloads Page
- Template Completed by Team
  - Project Description
  - Artwork
  - Use Microsoft Windows Office 365 Version of Word.

Computer Science and Engineering

Volkswagen Group of America
VW Car-Net Electric Vehicle Route Planner

Volkswagen Group of America is the North American operation headquarters and subsidiary of the Volkswagen Group, one of the world's leading automobile manufacturers. They are comprised of 8,000 employees in the United States and sell their vehicles through a 1,000-strong dealer network.

Electric vehicles are one of the latest innovations in the automobile industry. Volkswagen, who just released their first electric vehicle, the ID.4, want a way to show potential customers the benefits of electric vehicles compared to gas powered vehicles as well as address and correct some of the common misconceptions many people have about electric vehicles.

Our VW Car-Net Electric Vehicle Route Planner application is displayed in Volkswagen dealerships and educates potential car buyers about the benefits of buying an electric vehicle.

A major concern many buyers have about electric vehicles is the car's range and charging options available on the road. Our application generates driving routes for gas vehicles and electric vehicles that stop at charging stations. Buyers can compare these various routes with respect to route length, route path, fuel costs and carbon emissions.

Our application also allows for extensive customizability including sliders to adjust starting battery charge, climate control, temperature and weather conditions to account for the effects these factors have on battery consumption.

Our Electric Vehicle Route Planner helps assuage the fears of potential electric vehicle buyers by showing them that their daily routine will have minimal disruptions, and significant benefits if they switch to an electric vehicle.

Our Electric Vehicle Route Planner is developed as an Android application that utilizes API calls to handle route altering attributes and route generation. Our application is written in Kotlin.

PAGE 45

Team's Job

- Read instructions carefully.
- Check everything.
- Use Microsoft Windows Office 365 version of Word.
- Make a checklist.
- Write the project description.
- Read the instructions carefully.
- Provide the artwork.
- Read the instructions carefully.
- Update the project description and artwork.
- Make a checklist.
- Check everything 100 times.
- Read the instructions carefully.
- Make a checklist. ← **Key**

Note: Many slides in this deck are "reference slides," hence wordy.

Project Description [1 of 3]

- Read the instructions carefully. ← Have I mentioned this yet?
- Newspaper / Magazine Style
- Target Audience == General Public
- Do NOT Start…
  - "Our project is…"
  - "Our sponsor asked us to…"
  - "Our project aims to…"
- Use present tense throughout.
- Write as though your project is complete.
  - It works.
  - Your sponsor is using it.
- Fill the entire textbox, no less, no more.
- Read Past Examples
  - The Capstone Experience Booklet
  - Previous Design Day Booklets (Design Day > Booklet)
  - MSU Men's Basketball
- Make a Checklist ← Have I mentioned this yet?

Project Description [2 of 3]

- Beginning
  - Sponsor Overview
  - 2 to 3 Lines
- Middle
  - The Problem & Your Solution
    (Never write anything negative about your sponsor.)
  - Magazine Style
  - Understandable by Non-Technical Person
- End
  - Technical Jargon
  - 2 to 3 Lines

Project Description

[3 of 3]

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Never write anything negative about your sponsor.

Example Project Description: Spartan Basketball Player Timer

Michigan State University's Men's Basketball is elite, one of the top programs in the NCAA.

NCAA Division I basketball is very competitive. Although it may not be apparent to the casual observer, every detail of each game is carefully planned and scripted.

One aspect of a game plan is that of playing times. For each player, the coaches determine target times for how long he can play at a stretch, how long he needs to rest before playing again, and the total amount of time he should play in a game.

Developed with Coach Tom Izzo, our Spartan Basketball Player Timer is used by the basketball staff on the bench during the game.

When a player enters the game, his playing time is displayed with a solid green background. When his target playing time goes under two minutes, it is displayed in yellow. When the time goes below zero, it is displayed in red.

The color coding of times provides visual cues that can be seen by the coaches at a distance. If there are many yellow or red boxes, the coaches begin to plan substitutions.

A game summary for all the players can be displayed at any time whether the game clock is running or stopped.

Our software runs on a Microsoft Windows Tablet PC about the size of a traditional clipboard only slightly thicker. With no mouse or keyboard, all input is done with a pen.

Spartan Basketball Player Time is written in Visual Basic. The underlying database is Microsoft Access.

Artwork

[1 of 6]

- Read the instructions carefully.
- Must be of Your Working Software
- NOT Screen Mockups ← Note
- Take 2 to 3 screenshot(s) of working software.
  - Use eye-catching examples.
  - Avoid boring or trivial things.
    - Splash Screens
    - Login Screens
- Fill up the entire artwork space. Whitespace is bad!
- Overlap artwork if necessary.
- Include “framing” for web and mobile apps.
  - Browser with Window Frame
  - iPhone, iPad
  - Android Phone or Tablet
  - NOT Laptop or Desktop (Why not?)
  - See https://mockuphone.com.
  - Eliminate frame shadows.

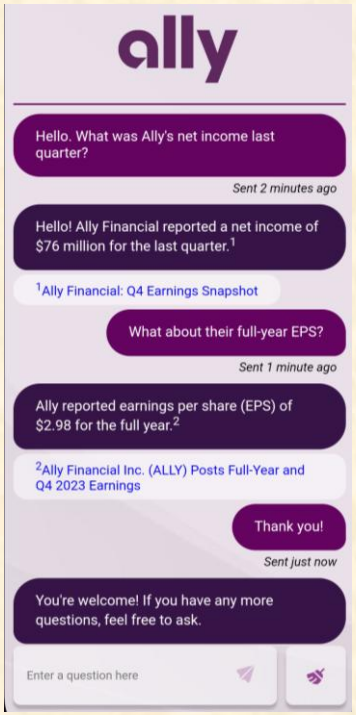
Artwork

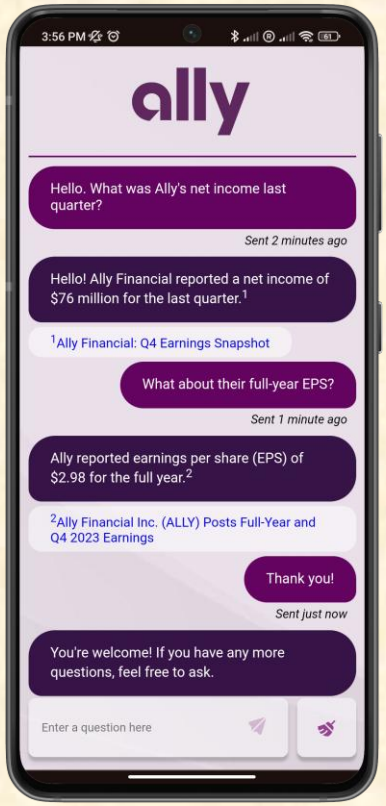
[2 of 6]

- Read the instructions carefully. ← Have I mentioned this yet?
- Add borders if necessary.
  - If Blends Into White Background
  - Create a single PNG for each piece of artwork using PowerPoint.
  - Read the instructions.
- Capture and provide very high-resolution images.
- Preserve aspect ratios.
- Crop to eliminate transparent “borders.”
- Eliminate all surrounding “whitespace.”
- Use paint.net for turning solid white space into transparent space and cropping.
- See examples.
  - The Capstone Experience Booklets in Lab
  - Design Day Booklet Feedback, Fall 2022
  - Design Day Booklet Feedback, Spring 2023
  - Design Day Booklet Feedback, Fall 2023
  - Design Day Booklet Feedback, Spring 2024
  - Previous Design Day Booklets (Design Day > Booklet)
  - MSU Men’s Basketball
- Make a Checklist ← Have I mentioned this yet?

Artwork

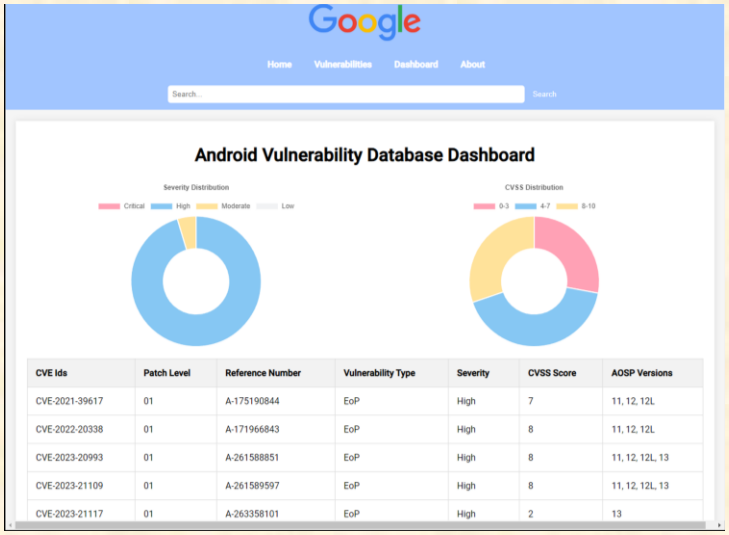
Embedded Mobile App

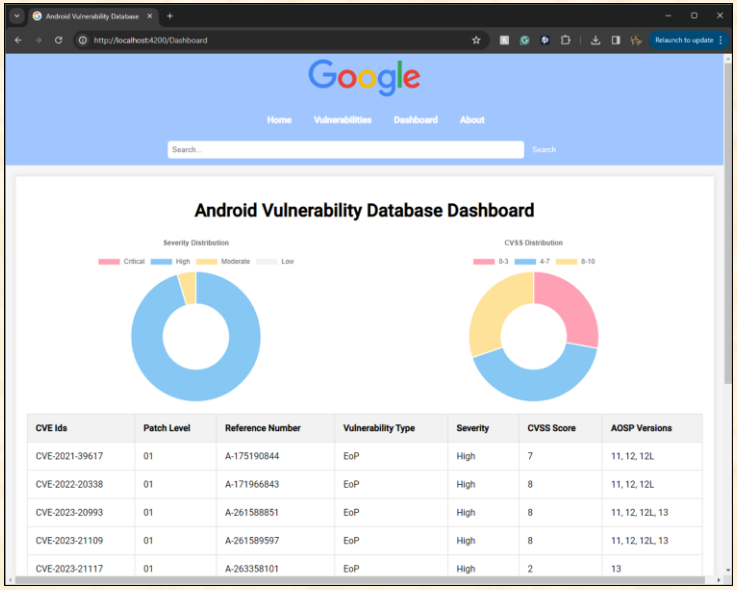




Artwork

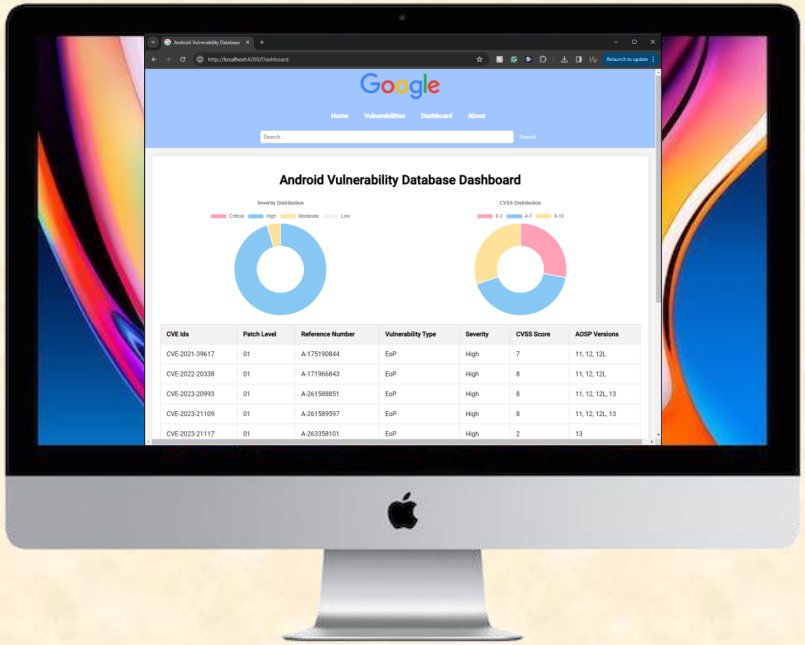
Embedded Browser App

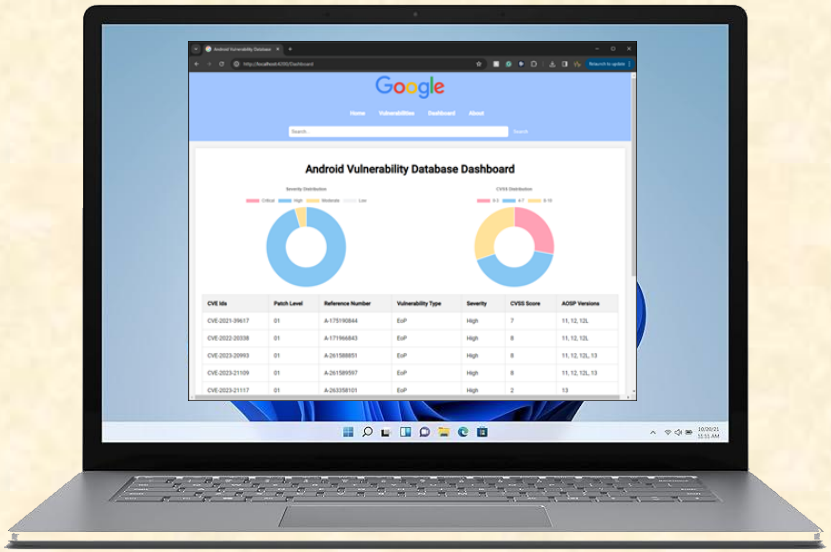




Artwork

Embedded Browser App

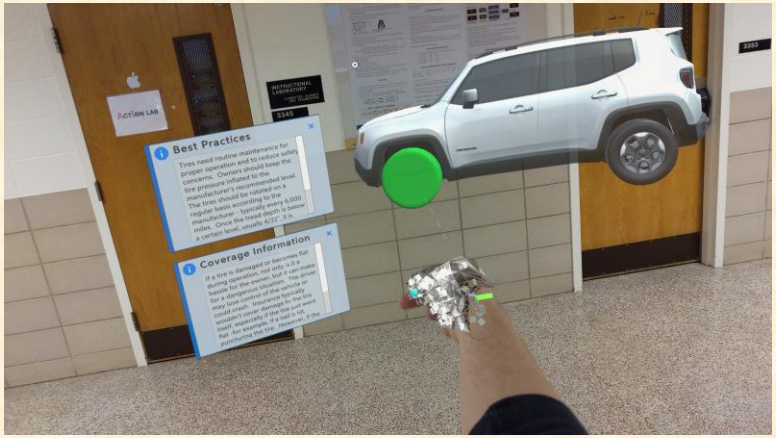




Why not?

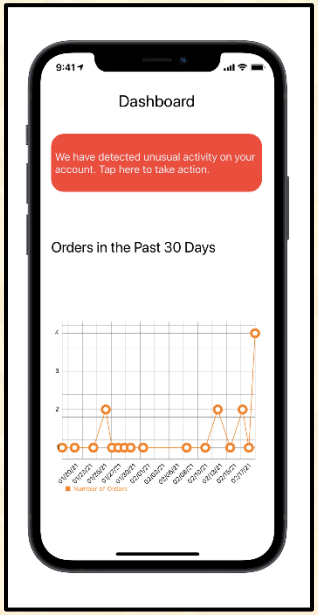
Artwork

Non-Embedded VR/AR App



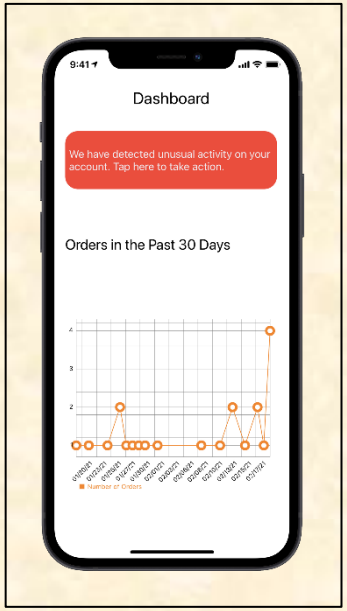
Artwork

[6 of 6]



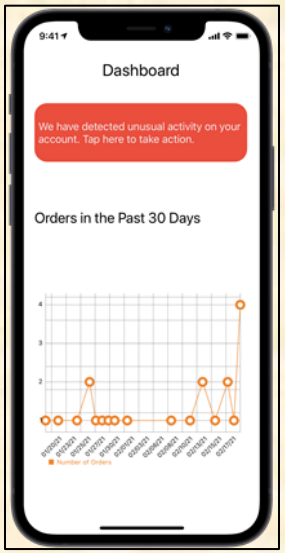
Too Much Solid White Whitespace

What's wrong with solid white whitespace? Two Things…



Too Much Transparent Whitespace

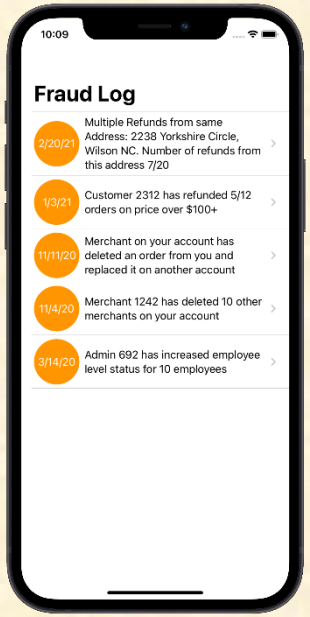
What's wrong with transparent whitespace?

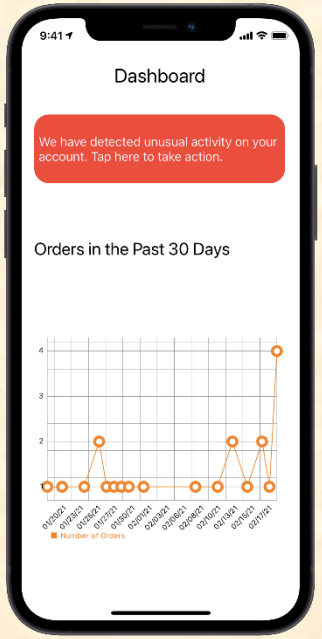


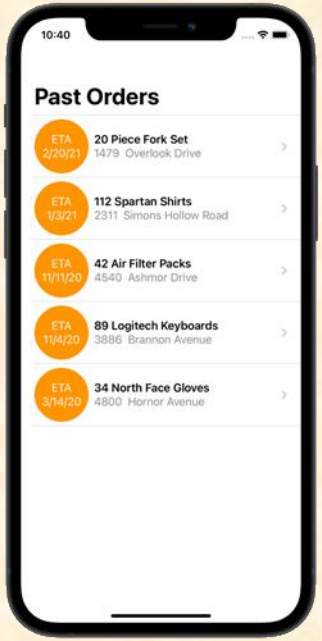
Nicely Cropped Transparent Whitespace

Artwork Whitespace Issues

[1 of 3]





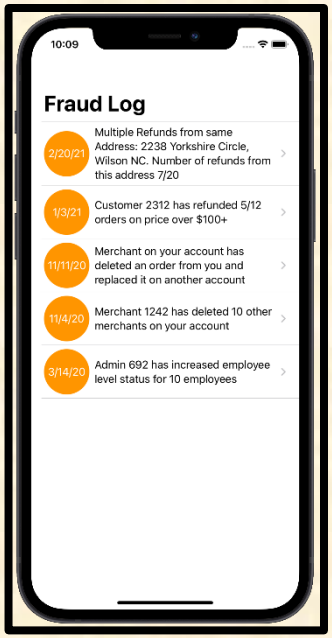


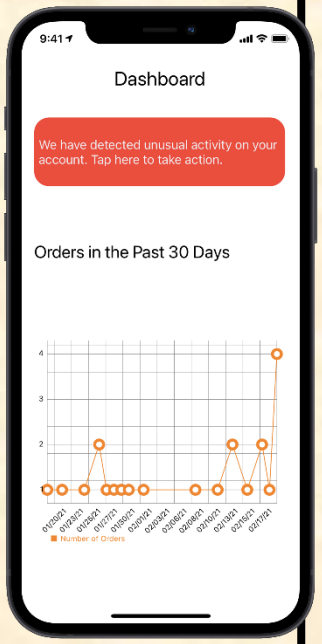
Look Identical

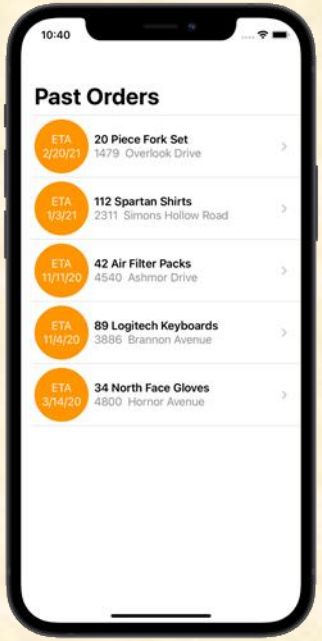
Key: Think about our graphical designer inserting your artwork (png files) into InDesign and then resizing them all to the same height and positioning them.

Artwork Whitespace Issues

[2 of 3]







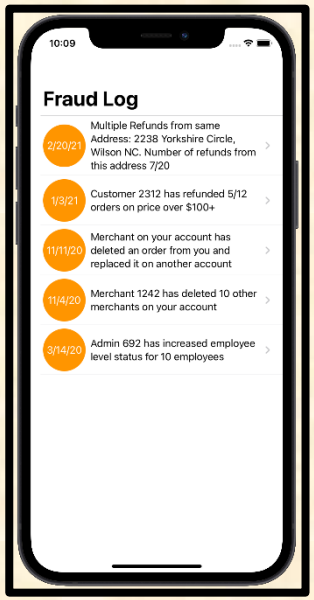
Border shows transparent whitespace.

Transparent whitespace is part of the image.

Designer selects all and makes them all 3” high.

Artwork Whitespace Issues

[3 of 3]

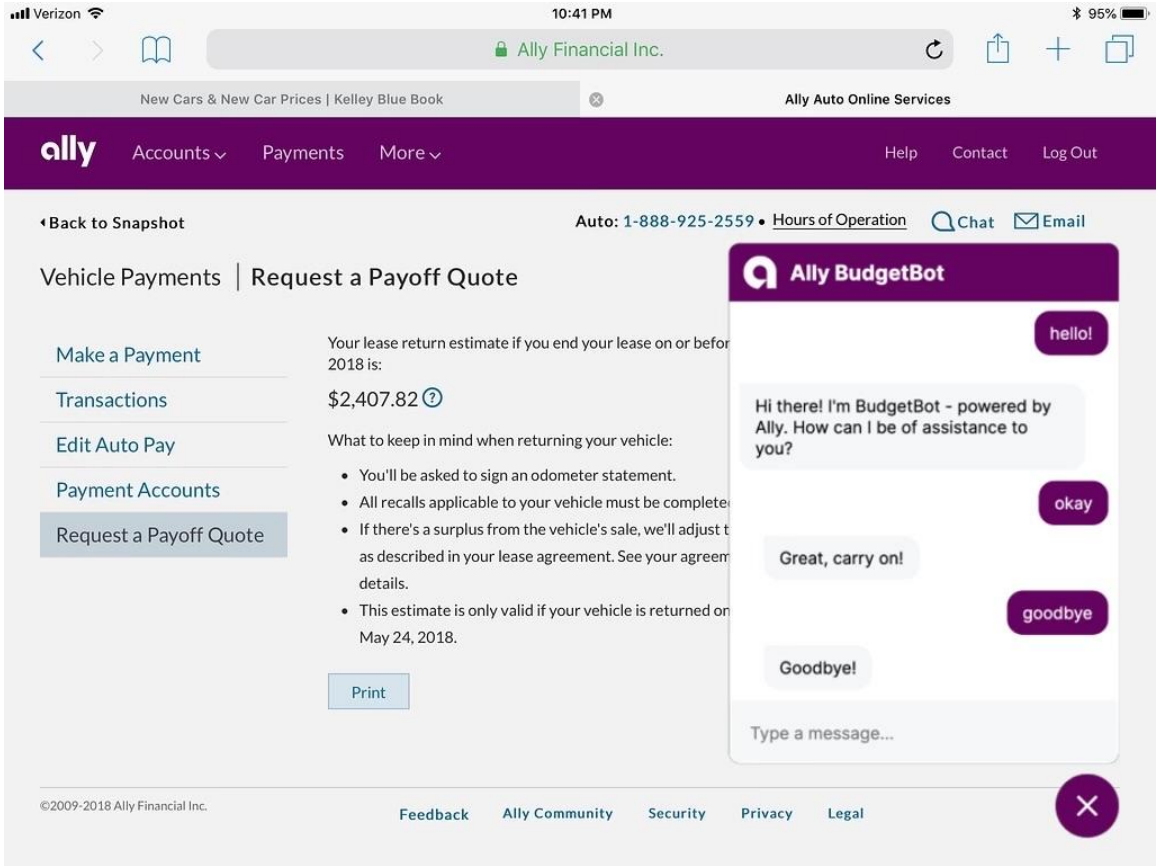


Select All. Rescale to 3” Height. The images (black boxes) are all 3” high.

Download Design Day Artwork Whitespace Tester

Artwork Border Issues

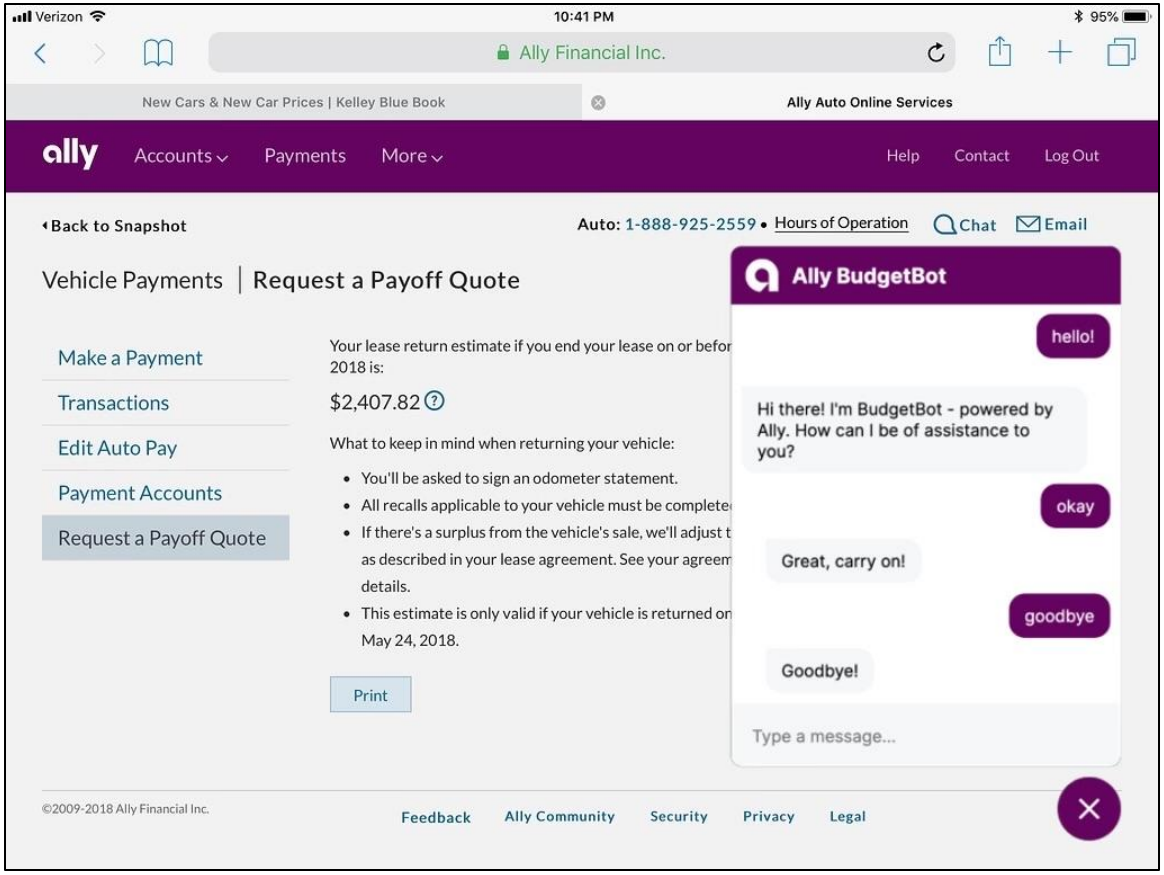
[1 of 6]



Artwork Border Issues

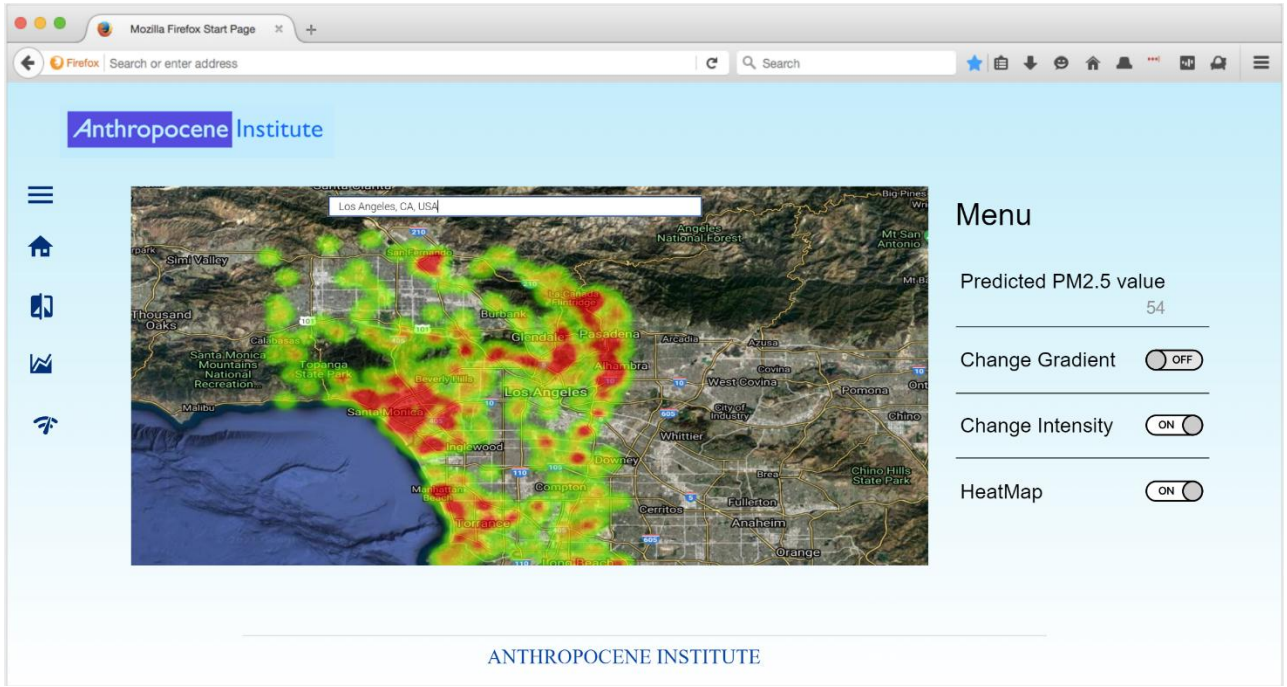
[2 of 6]

Issue Fixed
Border Added



Artwork Border Issues

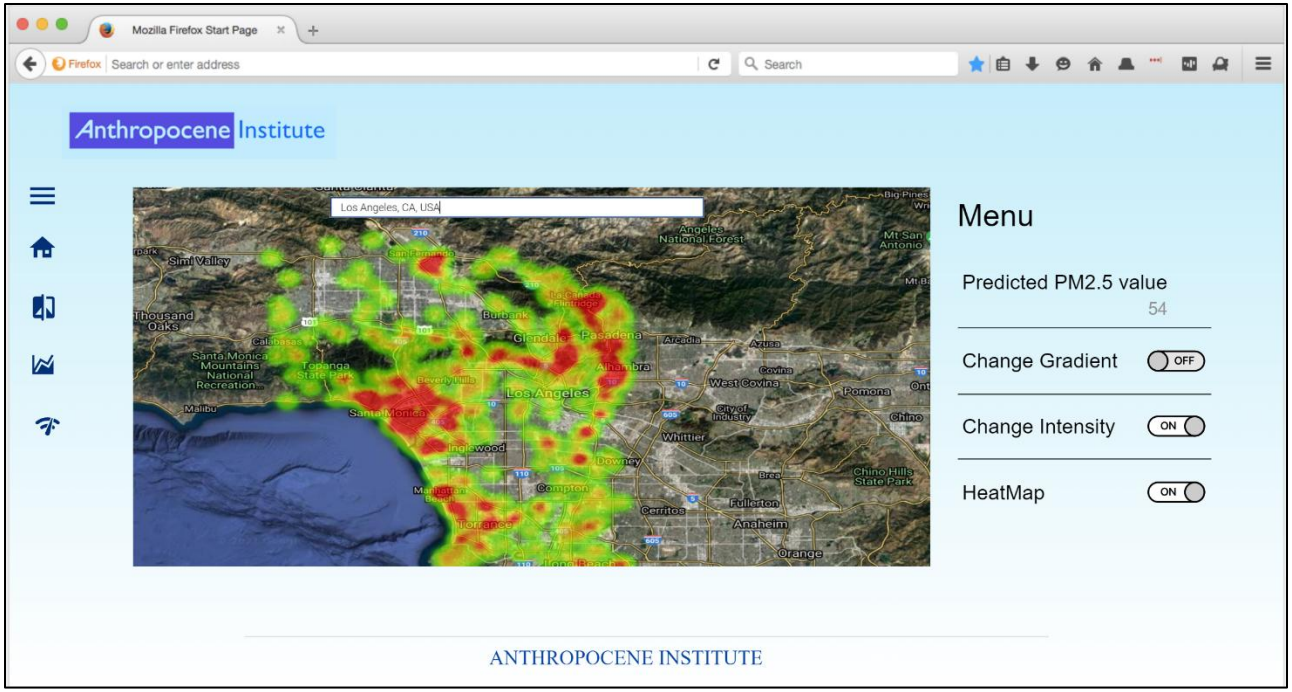
[3 of 6]



Artwork Border Issues

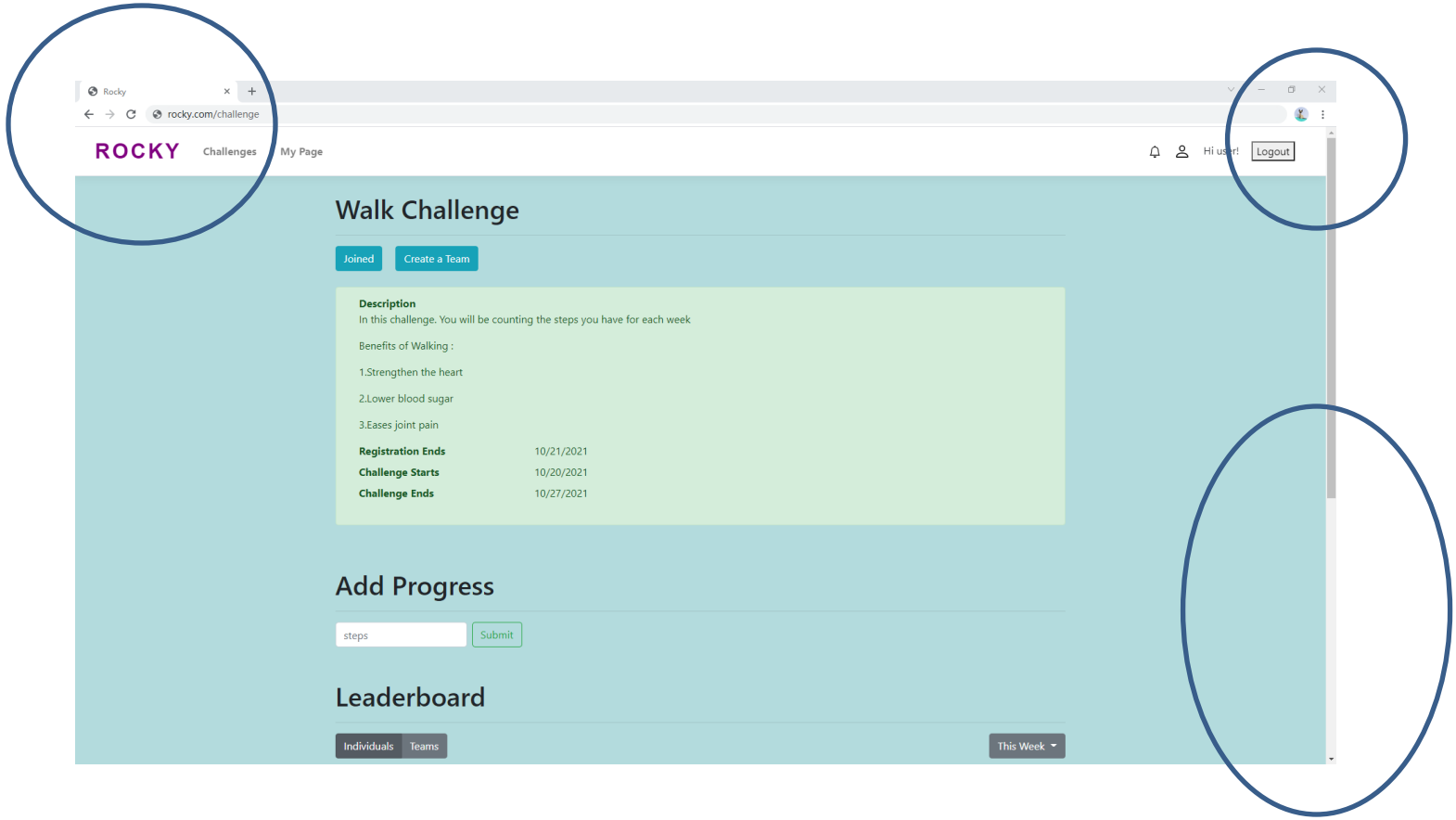
[4 of 6]

Issue Fixed
Border Added



Artwork Border Issues

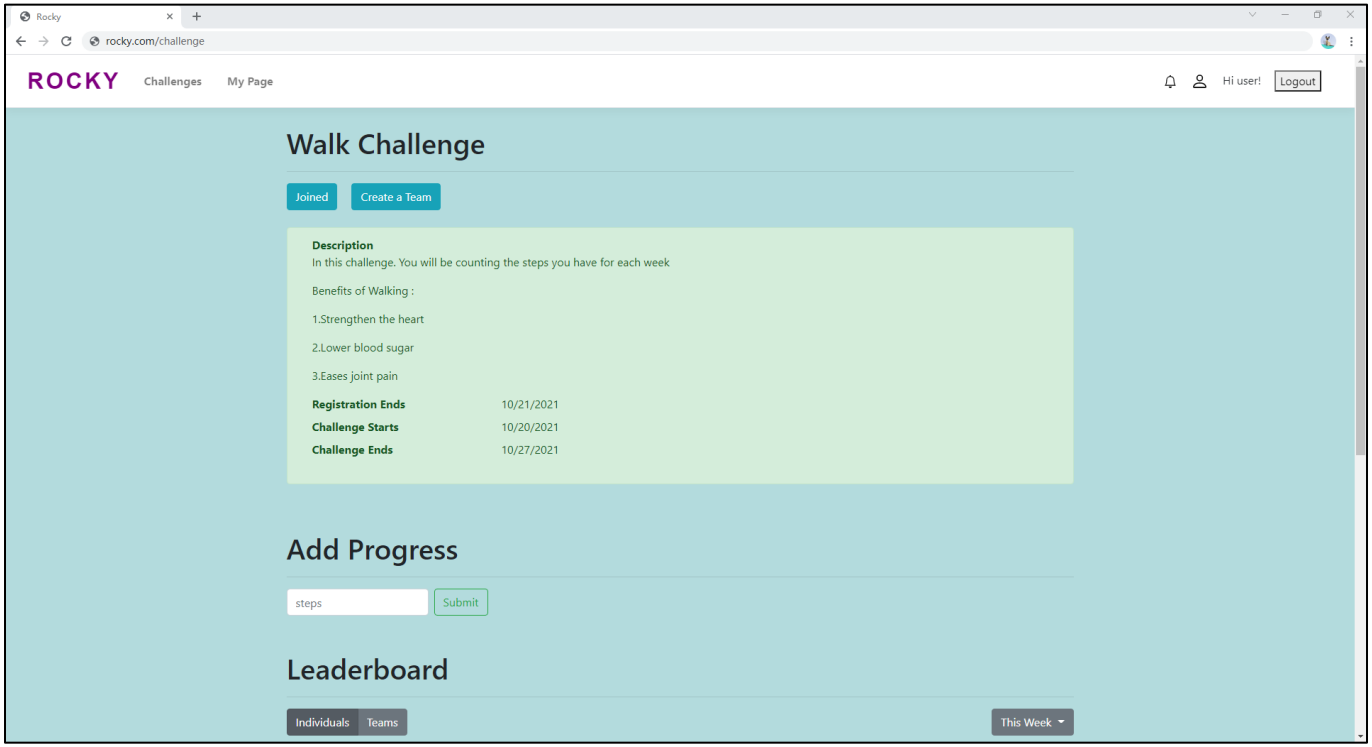
[5 of 6]



Artwork Border Issues

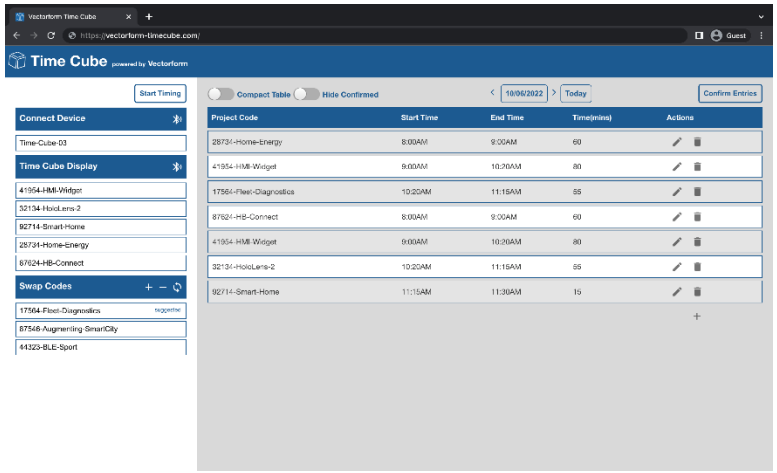
[6 of 6]

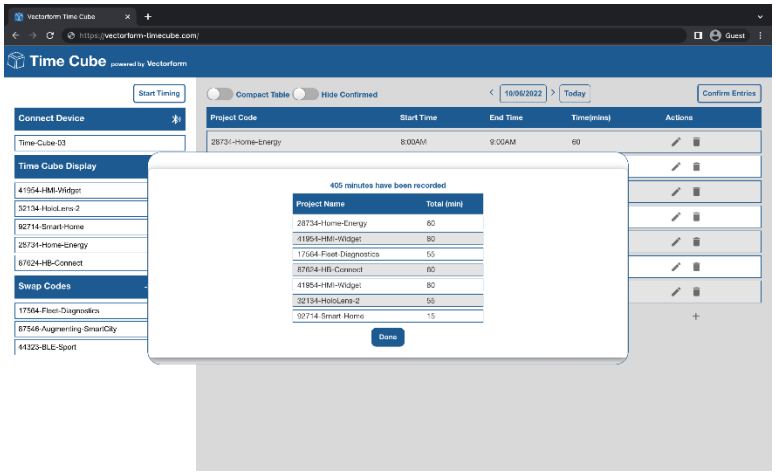
Issue Fixed
Border Added



Adding Artwork Border Issues [1 of 5]

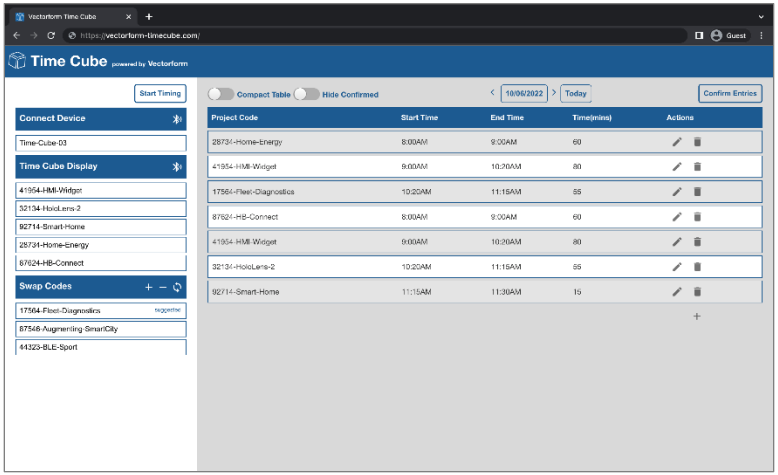
Original Screen Capture PNGs

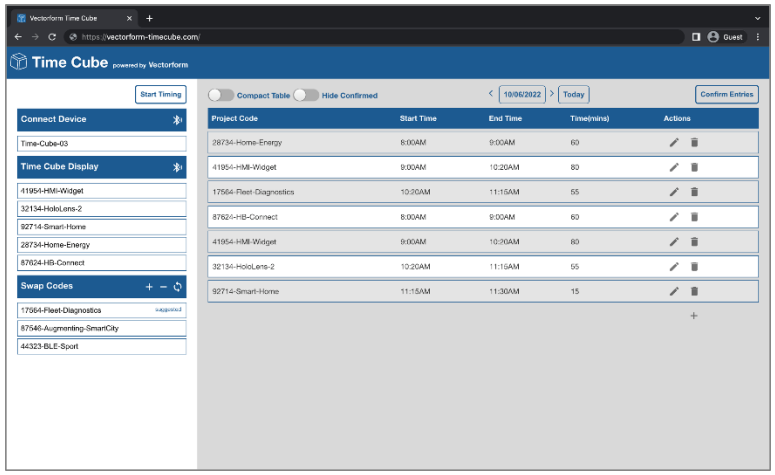




Adding Artwork Border Issues [2 of 5]

Border Added to Left Artwork Using Word in Template
Border Added to Right Artwork PNG using PowerPoint

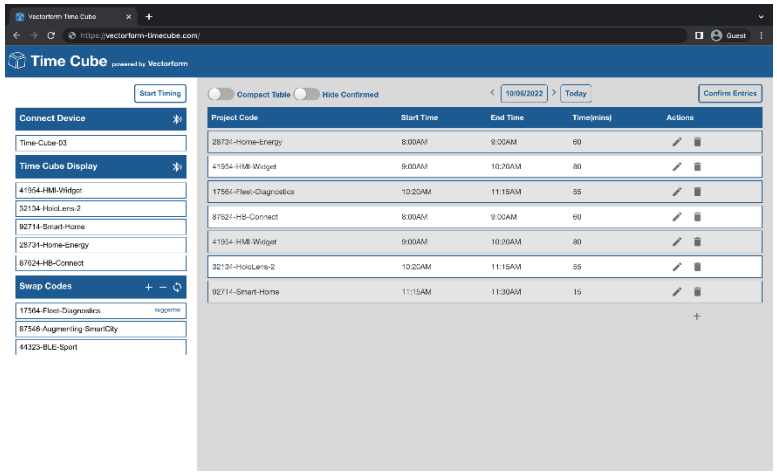


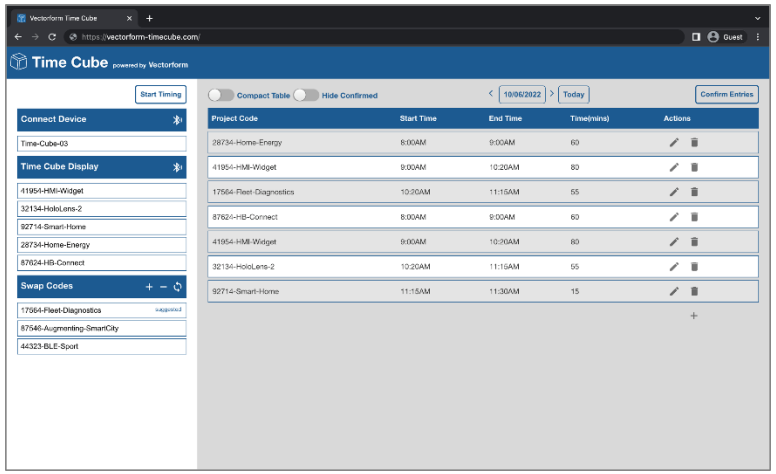


Looks fine, right? What's wrong?
Key: Graphic designer does <u>not</u> copy-and-paste artwork from the Word document. Graphic designer inserts PNG files into Design Day booklet.

Adding Artwork Border Issues [3 of 5]

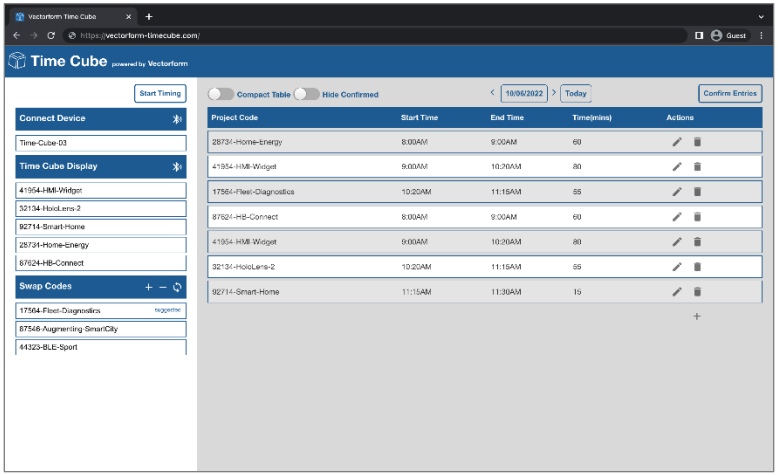
Artwork PNG files inserted to Design Day booklet by graphic designer.

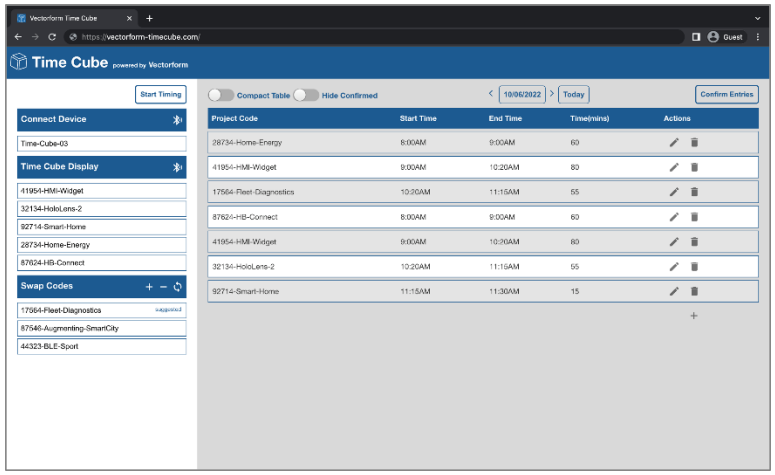




Adding Artwork Border Issues [4 of 5]

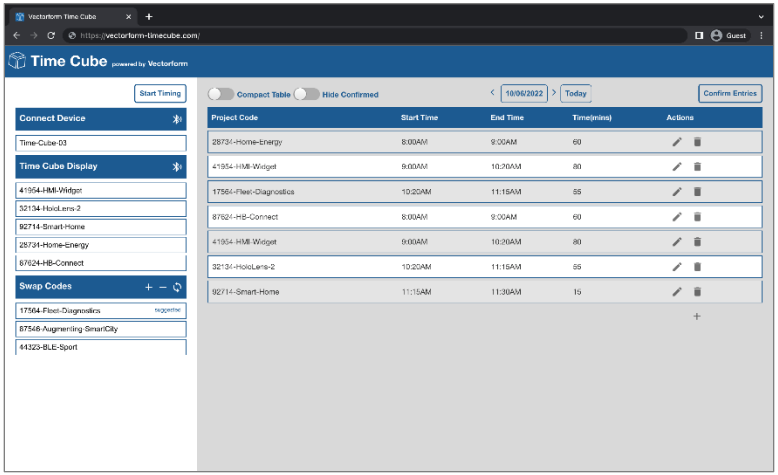
Border Added to Both Artwork PNGs using PowerPoint

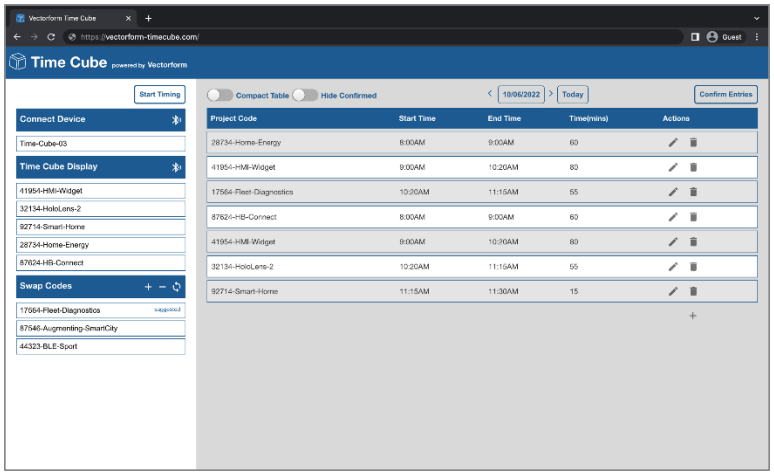




Adding Artwork Border Issues [5 of 5]

Graphic Designer Imports Artwork PNGs into InDesign

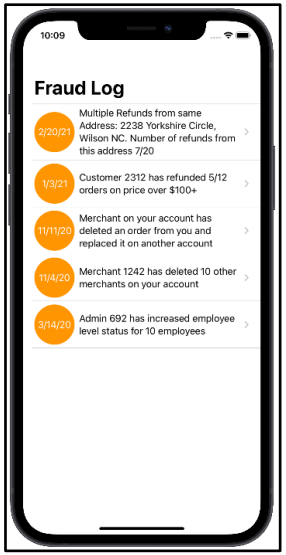




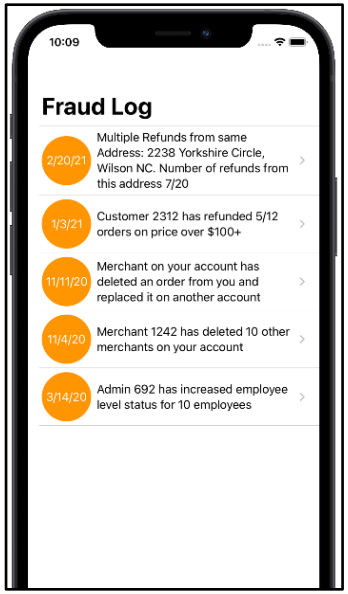
Textbox Clipping Artwork

[1 of 1]

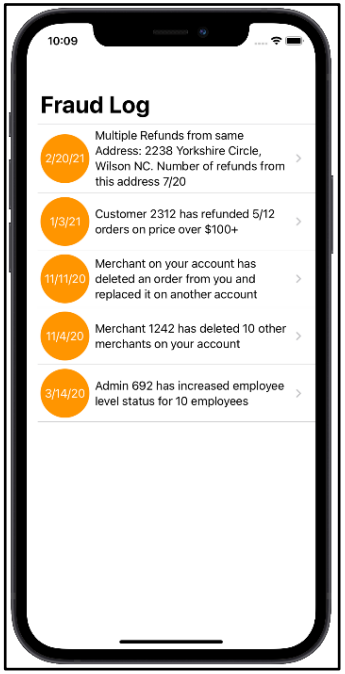
Original



Resized Artwork
Clipped by Textbox

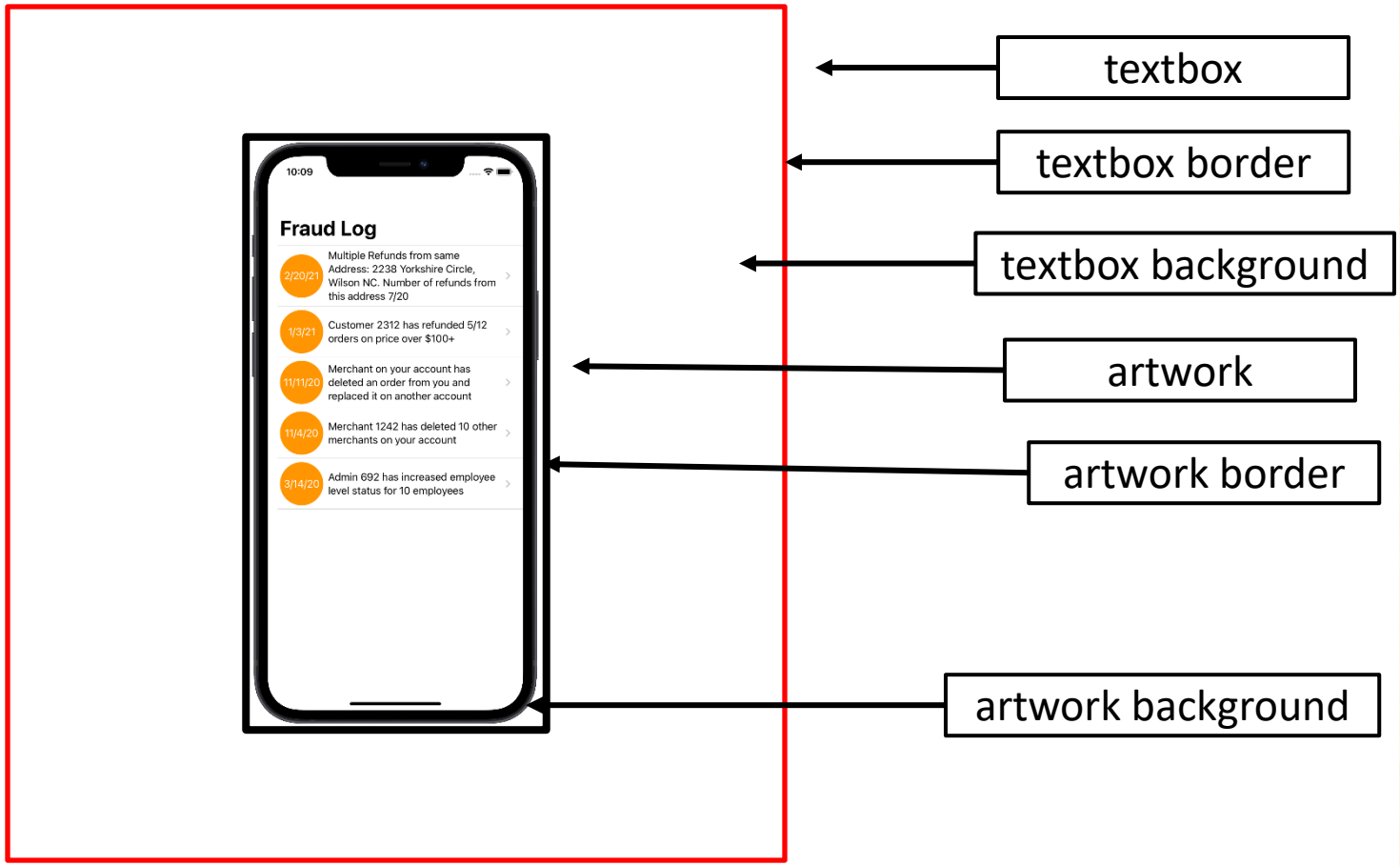


Resized Textbox



Artwork Who's on first?

[1 of 3]

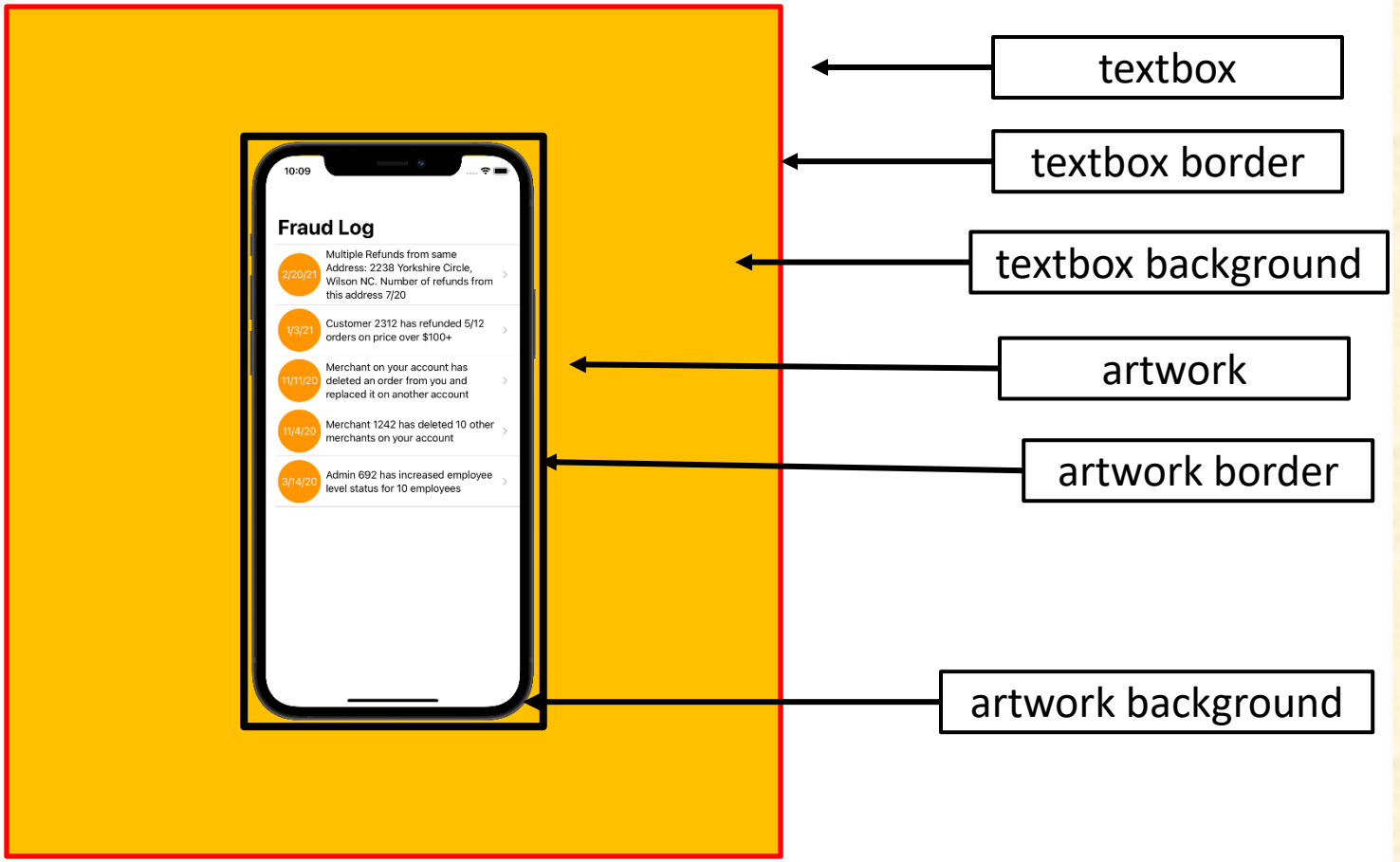


Artwork Who's on first?

[2 of 3]

Changed color of textbox background.

Artwork has transparent background.

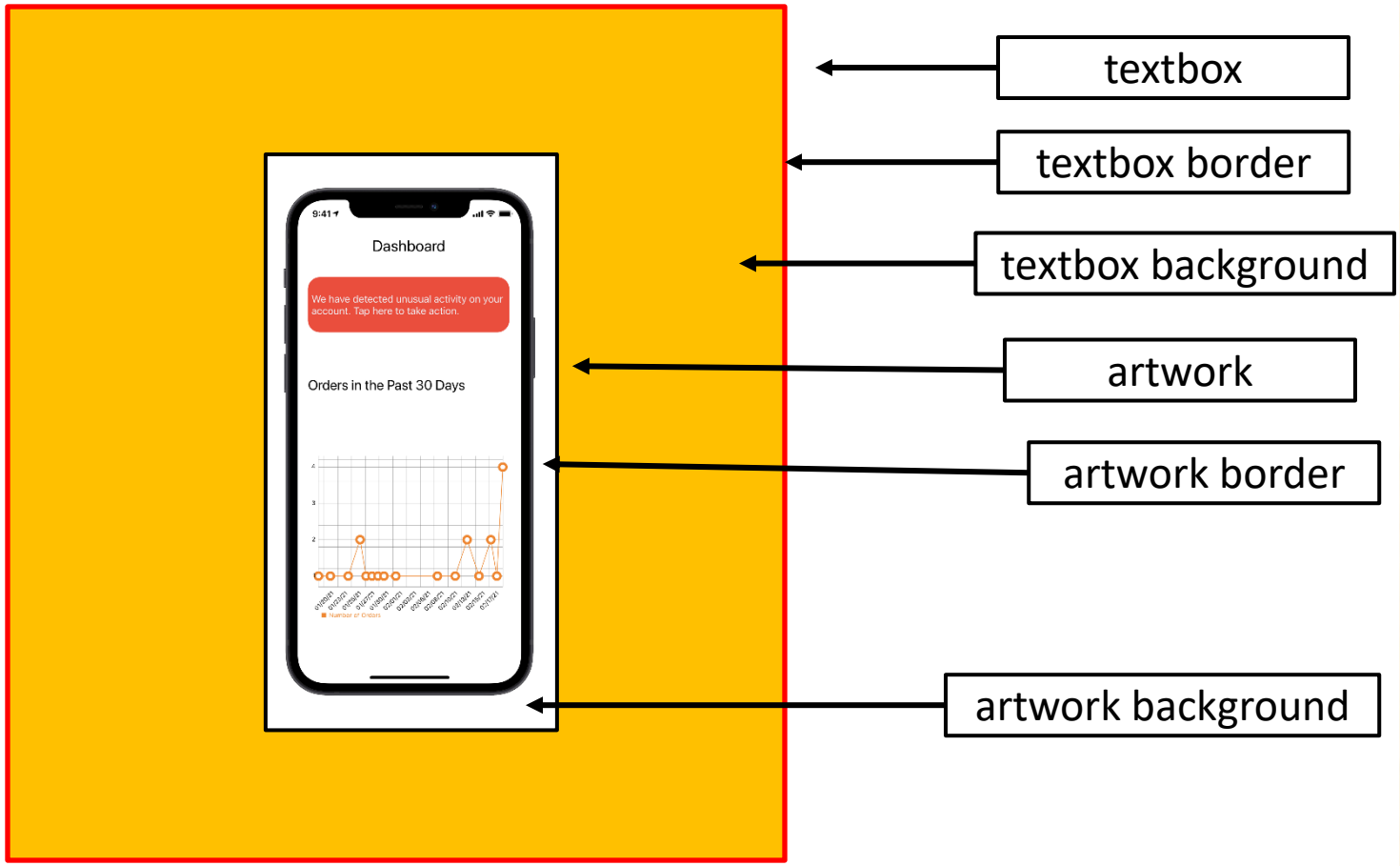


Artwork Who's on first?

[3 of 3]

Changed color of textbox background.

Artwork has white background, which is wrong. Why does this matter?



Artwork Example

[1 of 5]

CSE 498 / 7:30 a.m. Engineering Building, Room 3405 | Third Floor

Amazon

AVAST: Amazon Video And Shopping Technology

Founded in 1994 as an online bookstore, Amazon is the largest online retailer in the world. In addition to retail, Amazon offers services in cloud infrastructure through Amazon Web Services, and audio and video streaming through Amazon Music and Prime Video.

According to a recent study, 80% of internet usage will be people watching online videos by the year 2020. This presents a significant opportunity for all online retailers.

Our AVAST (Amazon Video And Shopping Technology) platform leverages the growth in online video streaming by providing users with an easy way to purchase products of interest that they see in the videos they are watching.

Using AVAST, an Amazon customer can stream videos from content providers such as YouTube and their favorite TV networks.

While a user is watching a video, AVAST analyzes it to find items of potential interest to the viewer. As the video plays, related Amazon products are displayed alongside the video as illustrated in the examples at the right.

For each item, AVAST displays a product description, pictures and ratings. A viewer can easily purchase any product simply by clicking on the conveniently provided link to Amazon.

The frontend of AVAST (Amazon Video And Shopping Technology) is built using Angular 6, while the backend is implemented using PHP Laravel. In addition, several Amazon Web Services are used including Rekognition to analyze videos, and EC2 to host the AVAST website.

amazon

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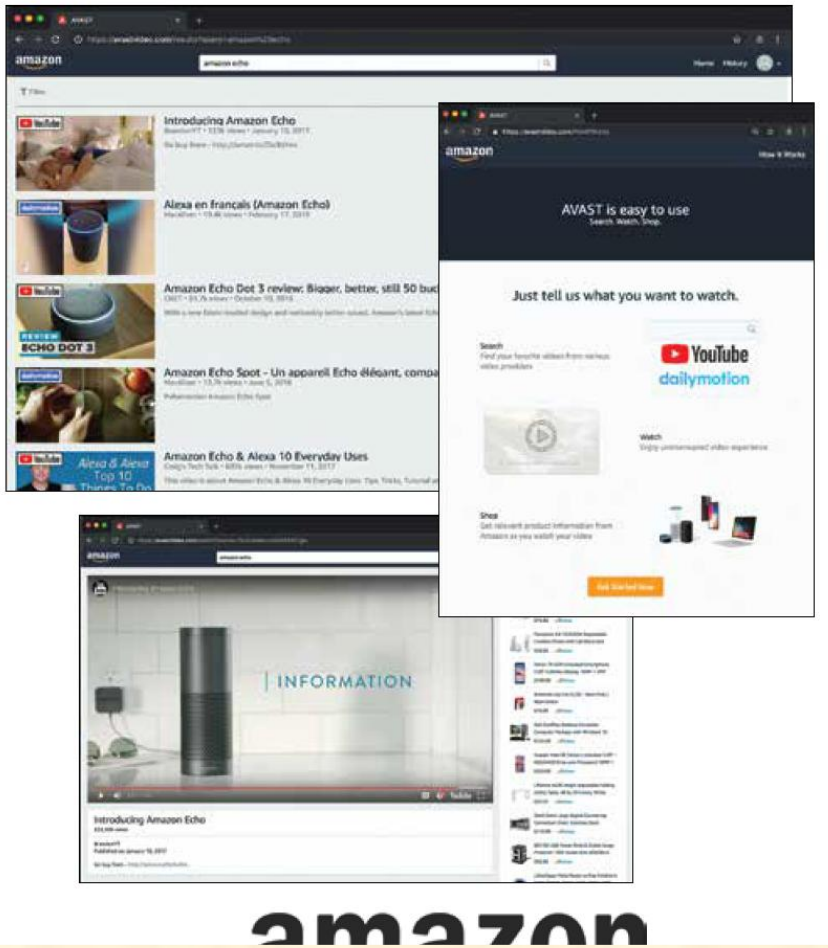
PAGE 26



amazon

Artwork Example

[2 of 5]

Engineering Building, Room 3405 | Third Floor **7:43 a.m. / CSE 498**

Aptiv
Autonomous Vehicle Fleet Connectivity App

Aptiv is a global technology company that is transforming mobility with its portfolio of safe, green, and connected solutions for its customers.

As a leader in autonomous vehicle development, Aptiv maintains an extensive test fleet of autonomous vehicles, which must be managed and monitored.

Our Autonomous Vehicle Fleet Connectivity App provides connectivity to Aptiv's autonomous test fleet, which operates across the US, Europe and Asia, and includes various vehicles with software for every level of autonomy.

Among other features, our system provides scheduling of test vehicles. After logging in, Aptiv engineers see a calendar view of the entire fleet from which they can select a particular day to obtain a list of available vehicles.

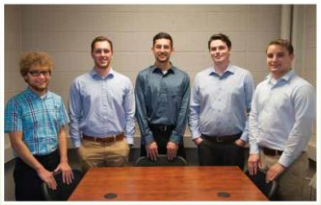
Once a vehicle is selected, our app displays a complete set of information about it including its past usage, reservations and diagnostic information.

In addition to checking availability of vehicles based on dates, our app provides for advanced search to narrow the scope based on things like type of vehicle, location of vehicle and level of autonomy.

The "My Reservations" tab shows a user's upcoming vehicle reservations as well as enabling them to make and cancel reservations.

Our Autonomous Vehicle Fleet Connectivity App is written using the Angular web framework, obtaining information from Aptiv's native servers. Communications are implemented using Microsoft Azure Services.

APTIV



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PAGE 27

APTIV

Artwork Example

[3 of 5]

CSE 498 / 7:56 a.m. Engineering Building, Room 3405 | Third Floor

Auto-Owners Insurance
Jeffrey: Virtual Insurance Claim Advisor

Auto-Owners Insurance is a Fortune 500 company that provides automotive, home, life and commercial insurance. Headquartered in Lansing, Michigan, Auto-Owners is represented by over 44,000 licensed insurance agents across 26 states, and provides insurance to nearly 3 million policyholders.

Every day, hundreds of insurance claims are filed with Auto-Owners through its independent agents. This process can be tedious for both policyholders and agents.

Our Jeffrey Virtual Insurance Claim Advisor system is a virtual claim assistant that automates the entire claim reporting process. Our mobile app, shown at the right, enables both agents and policyholders to file a claim easily and efficiently.

Jeffrey engages in a dialogue with policyholders and agents to gather information required to file their claim through natural conversation. If necessary, Jeffrey prompts users to take photos, record videos or attach documents relevant to a claim.

After completing a dialogue with a user, Jeffrey automatically gathers the appropriate claim information and submits it to Auto-Owners.

Our companion web app enables agents and Auto-Owners associates to find and review claim information that is submitted through the mobile application.

Our Jeffrey Virtual Insurance Claim Advisor system features natural language processing, which is implemented using Google's Dialogflow. A custom REST API, written in Kotlin, handles interactions between the applications and our MySQL database. Our web application is built using the React JavaScript framework.

Auto-Owners INSURANCE
LIFE · HOME · CAR · BUSINESS

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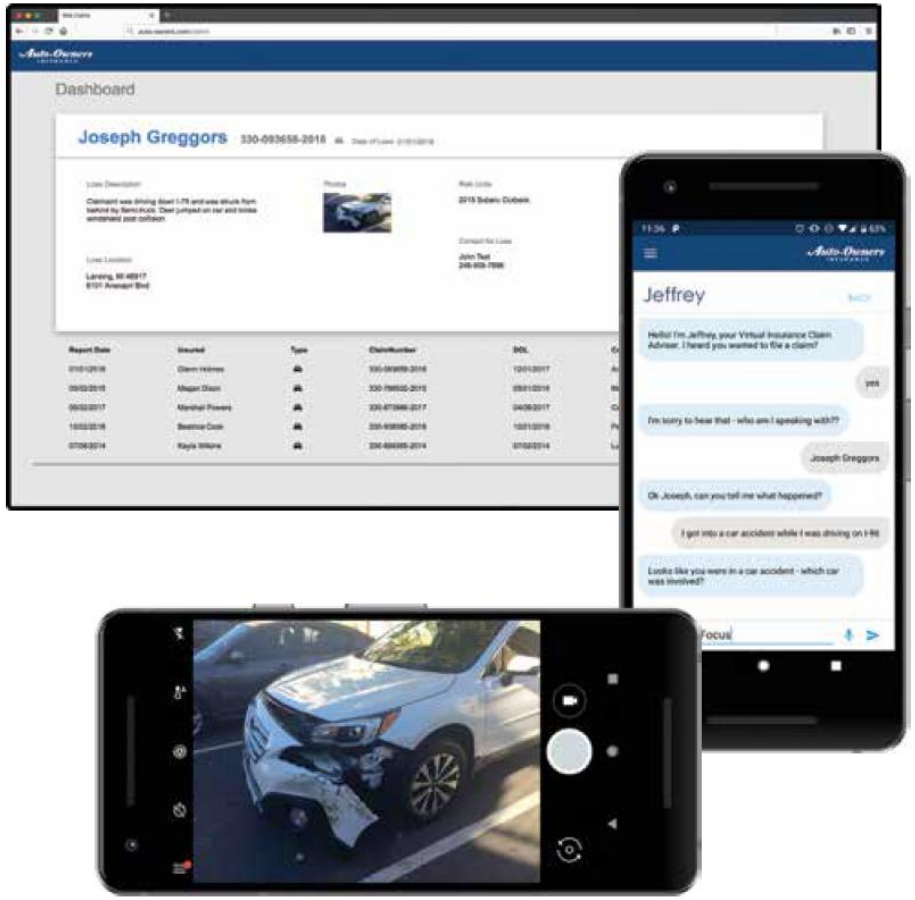
PAGE 28

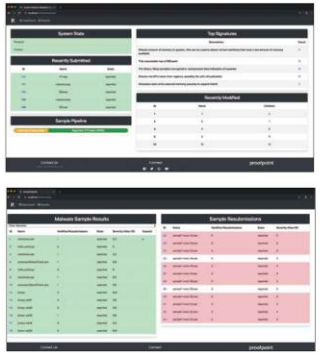


Artwork Example

[4 of 5]

Engineering Building, Room 3405 | Third Floor **9:53 a.m. / CSE 498**

Proofpoint
Improved Detonation of Evasive Malware



Headquartered in Sunnyvale, California, Proofpoint provides cybersecurity to many organizations, including Fortune 100 companies and educational institutions such as Michigan State University.

Analyzing malware is challenging. Viruses, spyware, ransomware and other malicious programs come in many complex forms. To protect its customers, Proofpoint uses tools called sandboxes, which are restricted computing environments where potentially harmful malware can be tested and analyzed safely.

Unfortunately, a new class of malware called "evasive malware" is rapidly emerging, thereby presenting a new, more dangerous class of cybersecurity threats.

Evasive malware has the ability to detect the presence of the sandbox environment. After doing so, it changes what it does, thereby evading analysis.

Our Improved Detonation of Evasive Malware system modifies evasive malware to block its ability to detect the sandbox environment, which causes it to execute. When the evasive malware does execute, its behavior is analyzed to determine precisely what it does so that Proofpoint can design countermeasures to protect against it.

Our web app, shown at the right, displays the results of processed malware. Users can check the status of the malware samples being tested as well as see the top evasive techniques being used. Both harmless and harmful evasive results are presented.

Our Improved Detonation of Evasive Malware system is implemented in Python, using the Cuckoo sandboxing framework and Suricata network monitor. Our web app is implemented using Python and Flask with the interface framed in Bootstrap and jQuery.

proofpoint.

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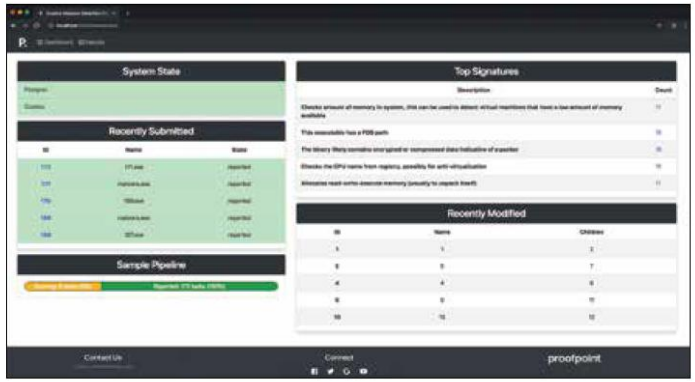
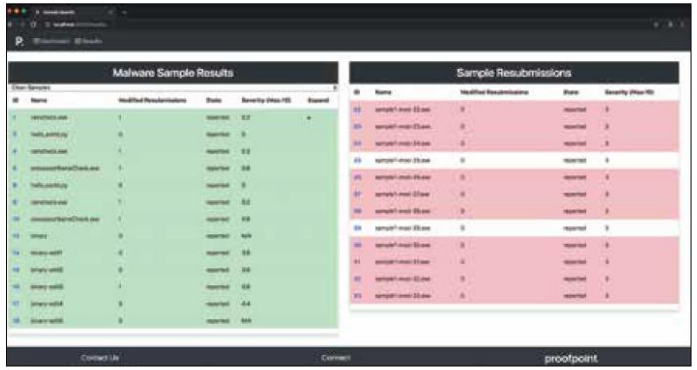
PAGE 37





proofpoint™

Artwork Example

[5 of 5]

The Capstone Experience

MSU Federal Credit Union

Banking with Amazon's Alexa and Apple's Siri

Founded in 1937, Michigan State University Federal Credit Union offers financial services to Michigan State University and Oakland University faculty, staff, students, alumni association members and their families. With 230,000 members and over $3.3 billion in assets, MSUFCU is the largest university-based credit union in the world.

MSUFCU currently offers mobile banking apps on both Apple (iOS) and Google Android devices for members to access their funds and perform banking transactions at any time.

Our Banking with Amazon's Alexa and Apple's Siri systems maintain MSUFCU's technological edge by expanding their banking offerings to voice-controlled smart devices such as Amazon Alexa-enabled devices, Apple Watch and Android Wear.

Voice-controlled technologies give MSUFCU members new ways to interact with their accounts, including accessing their account balance, transferring money and obtaining information about recent transactions. Members can request other information about MSUFCU such as branch hours, current loan rates and the location of the nearest ATM or Branch.

Our companion administrative web portal enables MSUFCU staff to manage the available information and services offered by these voice technologies. Frequently asked questions can be added to the apps in minutes to improve the user experience.

The Alexa skill is written in Python, Apple Watch in Swift and Android Wear in Java. All three contact a MySQL database through JSON. The administrative web portal is written in PHP.

MICHIGAN STATE UNIVERSITY
FEDERAL CREDIT UNION
Building Dreams Together

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PAGE 34

Previous Artwork Feedback

- Study Carefully to Learn
  - What to Do
  - What NOT to Do
- Posted on Downloads Page
  - Design Day Booklet Feedback, Fall 2022
  - Design Day Booklet Feedback, Spring 2023
  - Design Day Booklet Feedback, Fall 2023
  - Design Day Booklet Feedback, Spring 2024

Example Spartan Basketball Player Timer

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

Michigan State University Men's Basketball

Spartan Basketball Player Timer

NCAA Division I basketball is very competitive. Although it may not be apparent to the casual observer, every detail of each game is carefully planned and scripted.

One aspect of a game plan is that of playing times. For each player, the coaches determine target times for how long he can play at a stretch, how long he needs to rest before playing again, and the total amount of time he should play in a game.

Developed with Coach Tom Izzo, our Spartan Basketball Player Timer is used by the basketball staff on the bench during the game.

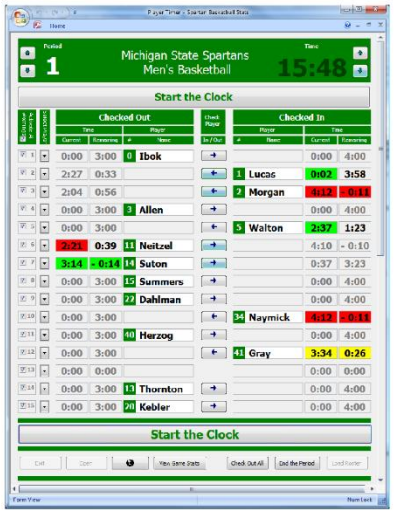
When a player enters the game, his playing time is displayed with a solid green background. When his target playing time goes under two minutes, it is displayed in yellow. When the time goes below zero, it is displayed in red.

The color coding provides visual cues that can be seen by coaches at a distance. If there are many yellow or red boxes, coaches begin to plan substitutions.

A game summary for all the players can be displayed at any time whether the game clock is running or stopped.

Our software runs on a Microsoft Windows Tablet PC about the size of a traditional clipboard only slightly thicker. With no mouse or keyboard, all input is done with a pen.

Spartan Basketball Player Timer is written in Visual Basic. The underlying database is Microsoft Access.



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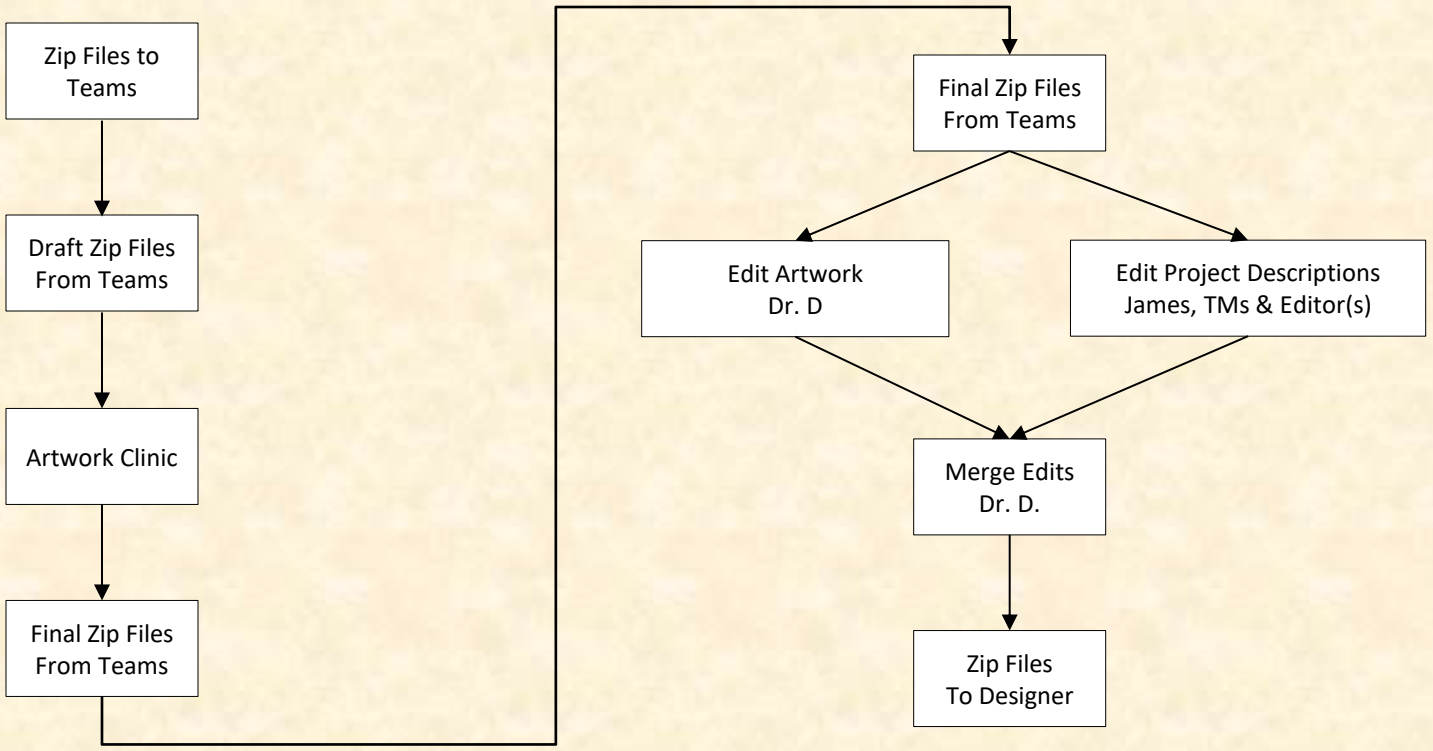
PAGE N + 0

The DD Booklet Production Process

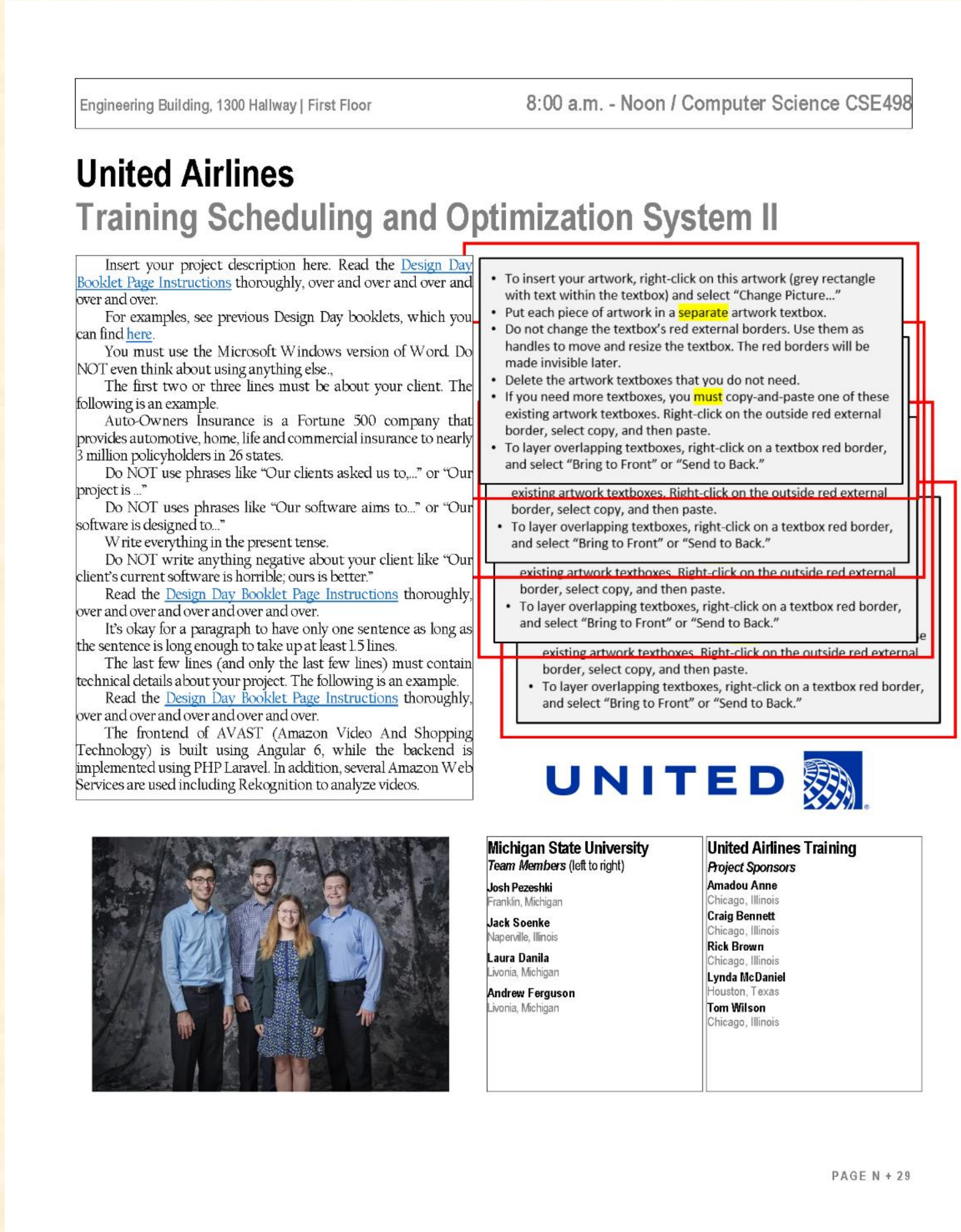


1
Template From Dr. D. To Team

All of the textboxes are named for processing

Do NOT create your own textboxes.

If necessary, start over from the original downloaded template.



Engineering Building, 1300 Hallway | First Floor — 8:00 a.m. - Noon / Computer Science CSE498

United Airlines
Training Scheduling and Optimization System II

Insert your project description here. Read the Design Day Booklet Page Instructions thoroughly, over and over and over and over and over.

For examples, see previous Design Day booklets, which you can find here.

You must use the Microsoft Windows version of Word. Do NOT even think about using anything else.,

The first two or three lines must be about your client. The following is an example.

Auto-Owners Insurance is a Fortune 500 company that provides automotive, home, life and commercial insurance to nearly 3 million policyholders in 26 states.

Do NOT use phrases like "Our clients asked us to,..." or "Our project is ..."

Do NOT uses phrases like "Our software aims to..." or "Our software is designed to..."

Write everything in the present tense.

Do NOT write anything negative about your client like "Our client's current software is horrible; ours is better."

Read the Design Day Booklet Page Instructions thoroughly, over and over and over and over and over.

It's okay for a paragraph to have only one sentence as long as the sentence is long enough to take up at least 1.5 lines.

The last few lines (and only the last few lines) must contain technical details about your project. The following is an example.

Read the Design Day Booklet Page Instructions thoroughly, over and over and over and over and over.

The frontend of AVAST (Amazon Video And Shopping Technology) is built using Angular 6, while the backend is implemented using PHP Laravel. In addition, several Amazon Web Services are used including Rekognition to analyze videos.

- To insert your artwork, right-click on this artwork (grey rectangle with text within the textbox) and select "Change Picture..."
- Put each piece of artwork in a separate artwork textbox.
- Do not change the textbox's red external borders. Use them as handles to move and resize the textbox. The red borders will be made invisible later.
- Delete the artwork textboxes that you do not need.
- If you need more textboxes, you must copy-and-paste one of these existing artwork textboxes. Right-click on the outside red external border, select copy, and then paste.
- To layer overlapping textboxes, right-click on a textbox red border, and select "Bring to Front" or "Send to Back."

UNITED

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Craig Bennett
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Rick Brown
Chicago, Illinois

Lynda McDaniel
Houston, Texas

Tom Wilson
Chicago, Illinois

PAGE N + 29

There are four placeholders for artwork.

The text boxes have red outlines for handles.

Each textbox includes one embedded placeholder artwork, a grey png image.

To add your artwork, right click on grey image and select Change Picture.

Delete the textboxes placeholders you don't need.

Do NOT create your own textboxes for artwork.

2 Project Description Draft From Team To Dr. D.

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

United Airlines

Training Scheduling and Optimization System II

United Airlines is the world's second largest airline company, operating 4,600 flights a day to 357 destinations. To maintain its fleet of 1,300 aircraft and ensure successful flights, it is crucial to have properly trained personnel. United's Technical Operations division has 60 instructors, who teach around 700 classes yearly to over 7,000 employees.

Our Training Scheduling and Optimization System II provides a web app to facilitate United's maintenance training schedulers to schedule instructors and students for courses across the country.

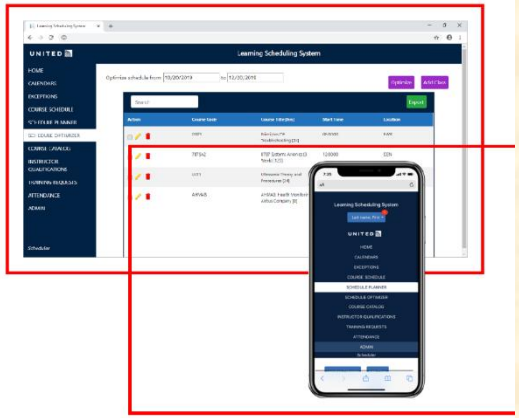
When the scheduler goes to schedule a course, the system displays available locations and instructors. The scheduler can also schedule a course from a training request inputted by instructors or supervisors.

Our system contains a schedule optimization system. Within a given time frame, a scheduler inputs a set of classes and locations. The optimizer recommends an optimal schedule, including instructor and classroom. This reduces the amount of time the scheduler needs to plan courses.

The scheduler will be able to view calendars with published, planned, and optimized courses. They can edit classes from this view. The calendars can be sorted by instructor, location, and class. If a conflict is attempted to be scheduled, a notification will alert the scheduler.

The web app is fully functional using both web browsers and mobile browsers.

Our Training Scheduling and Optimization System II web app is built with ASP.NET Core, Angular 8, Node.js, an Entity Framework, and an Azure SQL database. The web app is hosted as an app service on Azure Cloud Platform.



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PAGE N + 24

2 Project Description Draft From Team To Dr. D.

Read aloud.

Search your project description for the word “will.”

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

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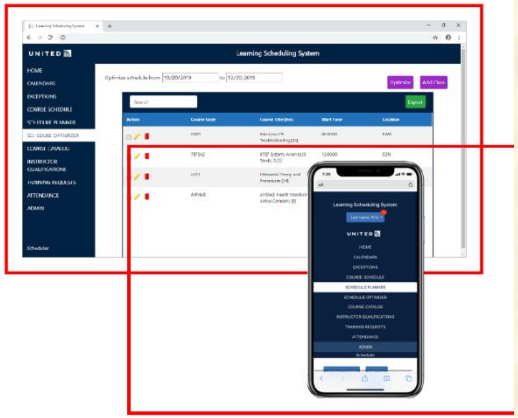

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PAGE N + 24

3
Project Description Edits By James & TMs

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

United Airlines

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Our Training Scheduling and Optimization System II provides a web app to facilitate United's maintenance training schedulers to schedule instructors, students, and courses across the country.

When the scheduler wants to schedule a course, they must take into account a number of factors, including: instructor availability, venue availability, instructor travel distance, and instructor qualifications.

Using our web and iOS apps, users can schedule classes manually, or through our automated schedule optimizer. Manual scheduling can be used effectively for a few classes in a short time frame. However, when dealing with a large number of classes, taking into account all relevant factors, manual scheduling is an arduous task.

Our schedule optimization feature allows a scheduler to input a given time frame, a set of classes, and a set of locations. The optimizer then recommends an optimal schedule, including instructor and classroom assignments.

The optimized schedule minimizes the distance traveled by instructors, and takes into account instructor preferences and room availabilities.

An optimized schedule saves United Airlines significant time, money, and resources.

Our Training Scheduling and Optimization System II web app is built with ASP.NET Core, Angular 8, Node.js, an Entity Framework, and an Azure SQL database. The web app is hosted as an app service on Azure Cloud Platform.

Round 1 edits

- Our Training Scheduling and Optimization System II provides a web app to facilitate United's maintenance training schedulers to schedule instructors and students for courses across the country.
- When the scheduler goes to schedule a course, the system displays available locations and instructors. The scheduler can also schedule a course from a training request inputted by instructors or supervisors.
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-

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3 Project Description Edits By Jill

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

United Airlines

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Round 2 edits by Jill...

- instructors (remove coma)
- including (I would remove the colon)
- timeframe
- classes, (would remove the comma and insert "and")
- timeframe

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PAGE N + 24

3
Artwork Draft From Team To Dr. D.

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

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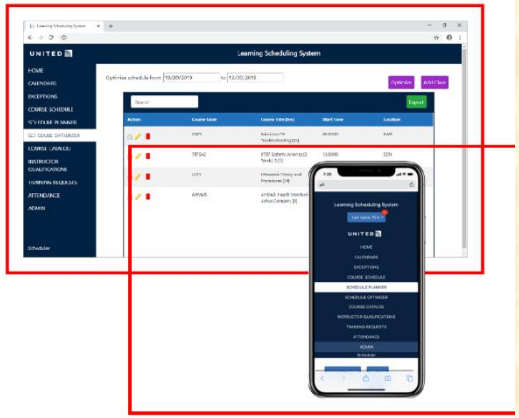

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Andrew Ferguson
Livonia, Michigan

United Airlines
Project Sponsors

Amadou Anne
Chicago, Illinois

Craig Bennett
Chicago, Illinois

Rick Brown
Chicago, Illinois

Lynda McDaniel
Houston, Texas

Tom Wilson
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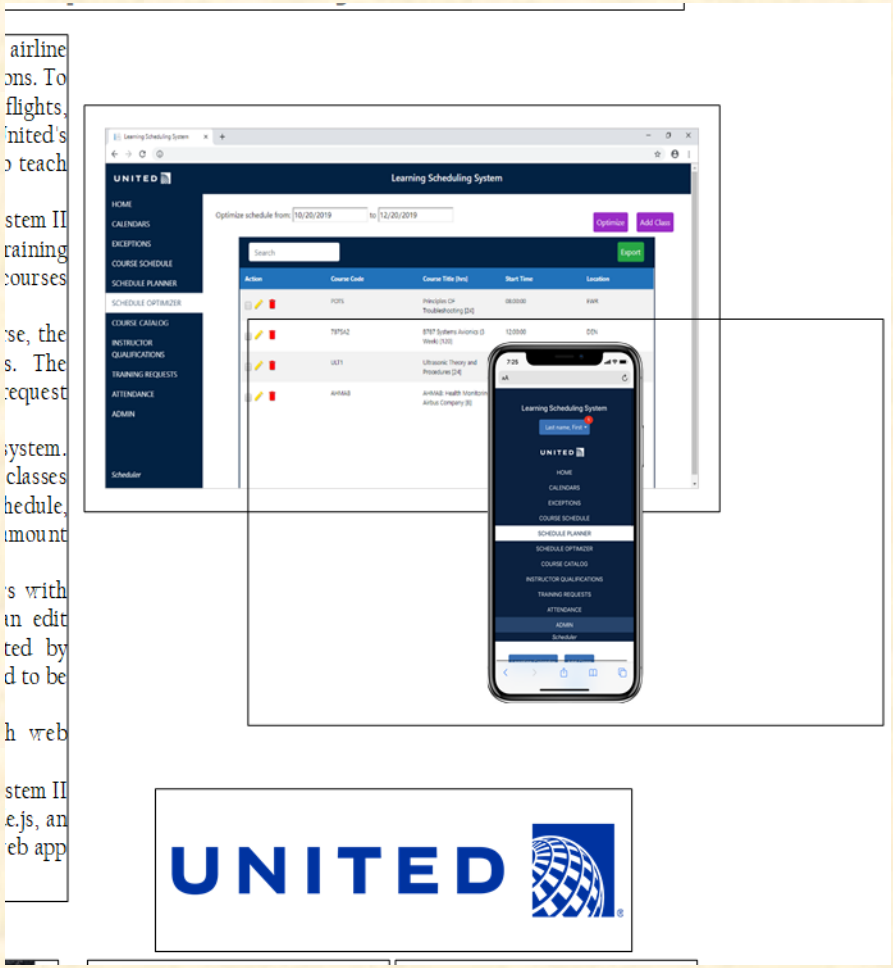
PAGE N + 24

3
Artwork Draft From Team To Dr. D.



What's wrong with this artwork?

3
Artwork Draft Feedback by Dr. D.

Dr. D. duplicated existing artwork to illustrate requested update.

3
Artwork Update From Team To Dr. D.

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

United Airlines
Training Scheduling and Optimization System II

United Airlines is the world's second largest airline company, operating 4,600 flights a day to 357 destinations. To maintain its fleet of 1,300 aircraft and ensure successful flights, it is crucial to have properly trained personnel. United's Technical Operations division has 60 instructors, who teach around 700 classes yearly to over 7,000 employees.

Our Training Scheduling and Optimization System II provides a web app to facilitate United's maintenance training schedulers to schedule instructors and students for courses across the country.

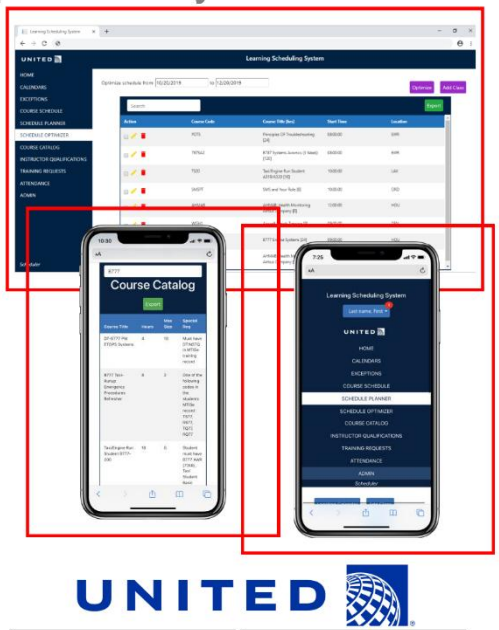
When the scheduler goes to schedule a course, the system displays available locations and instructors. The scheduler can also schedule a course from a training request inputted by instructors or supervisors.

Our system contains a schedule optimization system. Within a given time frame, a scheduler inputs a set of classes and locations. The optimizer recommends an optimal schedule, including instructor and classroom. This reduces the amount of time the scheduler needs to plan courses.

The scheduler will be able to view calendars with published, planned, and optimized courses. They can edit classes from this view. The calendars can be sorted by instructor, location, and class. If a conflict is attempted to be scheduled, a notification will alert the scheduler.

The web app is fully functional using both web browsers and mobile browsers.

Our Training Scheduling and Optimization System II web app is built with ASP.NET Core, Angular 8, Node.js, an Entity Framework, and an Azure SQL database. The web app is hosted as an app service on Azure Cloud Platform.



UNITED

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Jack Soenke
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Livonia, Michigan

Andrew Ferguson
Livonia, Michigan

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4
Final Update From Team To Dr. D.

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

United Airlines

Training Scheduling and Optimization System II

United Airlines is the world's second largest airline company, operating 4,600 flights a day to 357 destinations. To maintain its fleet of 1,300 aircraft and ensure successful flights, it is crucial to have properly trained personnel. United's Technical Operations division has 45 instructors who teach around 700 classes yearly to over 7,000 employees.

Our Training Scheduling and Optimization System II provides a web app to facilitate United's maintenance training schedulers to schedule instructors, students, and courses across the country.

When the scheduler wants to schedule a course, they must take into account a number of factors, including instructor availability, venue availability, instructor travel distance, and instructor qualifications.

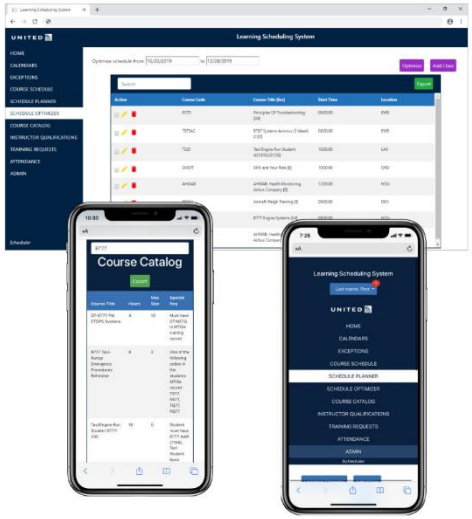
Using our mobile compatible website, users can schedule classes manually, or through our automated schedule optimizer. Manual scheduling can be used effectively for a few classes in a short time frame. However, when dealing with a large number of classes and taking into account all relevant factors, manual scheduling is an arduous task.

Our schedule optimization feature allows a scheduler to input a given time frame, a set of classes, and a set of locations. The optimizer then recommends an optimal schedule, including instructor and classroom assignments.

The optimized schedule minimizes the distance traveled by instructors and takes into account instructor qualifications and room availabilities.

An optimized schedule saves United Airlines significant time, money, and resources.

Our Training Scheduling and Optimization System II web app is built with ASP.NET Core, Angular 8, Node.js, an Entity Framework, and an Azure SQL database. The web app is hosted as an app service on Azure Cloud Platform.



UNITED

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4
Final Version From Dr. D. To Designer

Computer Science CSE498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

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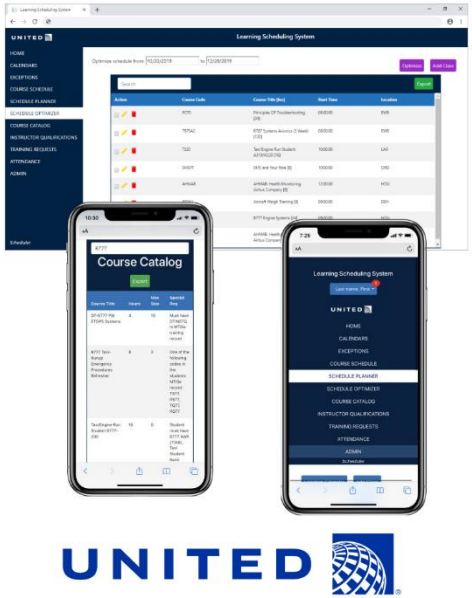

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Design Day Booklet

CSE 498 / 8:00 a.m. - Noon Engineering Building, 1300 Hallway | First Floor

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Training Scheduling and Optimization System II

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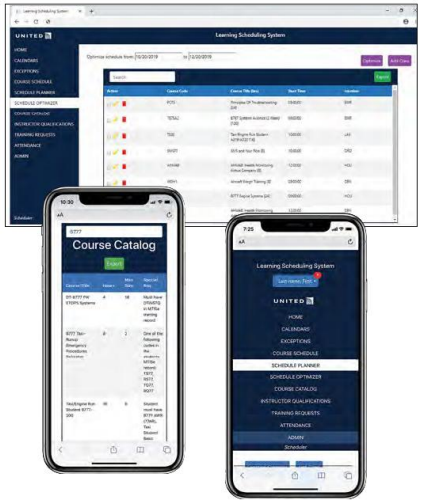
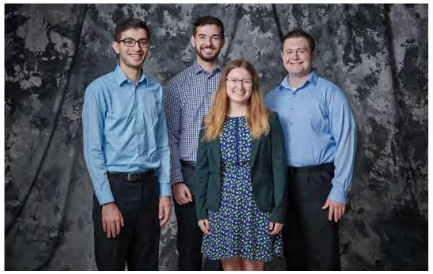


UNITED



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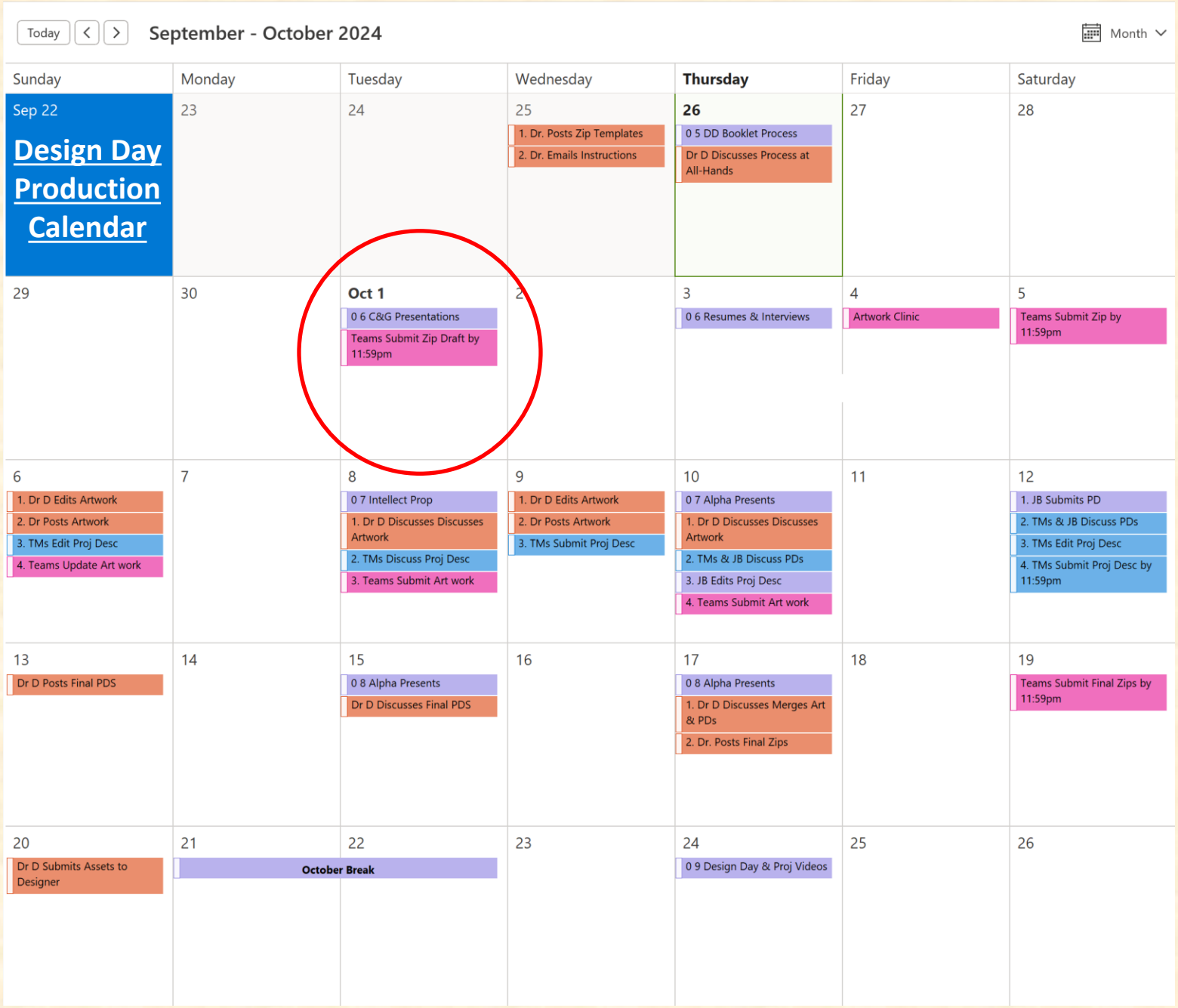
PAGE 46


Today
September - October 2024
Month
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sep 22
Design Day Production Calendar
23
24
25
1. Dr. Posts Zip Templates
2. Dr. Emails Instructions
26
0 5 DD Booklet Process
Dr D Discusses Process at All-Hands
27
28
29
30
Oct 1
0 6 C&G Presentations
Teams Submit Zip Draft by 11:59pm
2
3
0 6 Resumes & Interviews
4
Artwork Clinic
5
Teams Submit Zip by 11:59pm
6
1. Dr D Edits Artwork
2. Dr Posts Artwork
3. TMs Edit Proj Desc
4. Teams Update Art work
7
8
0 7 Intellect Prop
1. Dr D Discusses Discusses Artwork
2. TMs Discuss Proj Desc
3. Teams Submit Art work
9
1. Dr D Edits Artwork
2. Dr Posts Artwork
3. TMs Submit Proj Desc
10
0 7 Alpha Presents
1. Dr D Discusses Discusses Artwork
2. TMs & JB Discuss PDs
3. JB Edits Proj Desc
4. Teams Submit Art work
11
12
1. JB Submits PD
2. TMs & JB Discuss PDs
3. TMs Edit Proj Desc
4. TMs Submit Proj Desc by 11:59pm
13
Dr D Posts Final PDS
14
15
0 8 Alpha Presents
Dr D Discusses Final PDS
16
17
0 8 Alpha Presents
1. Dr D Discusses Merges Art & PDs
2. Dr. Posts Final Zips
18
19
Teams Submit Final Zips by 11:59pm
20
Dr D Submits Assets to Designer
21
22
October Break
23
24
0 9 Design Day & Proj Videos
25
26

Zipped Assets File

- Link On Downloads Page
- Customized Per Team
- Contents
  - Project Page Template .docx
  - Four Template Artwork Files .png
- Do not change filenames.
- Example: amazon-assets.zip
  - amazon-page.docx
  - amazon-artwork-1.png (Very High Resolution)
  - amazon-artwork-2.png (Very High Resolution)
  - amazon-artwork-3.png (Very High Resolution)
  - amazon-artwork-4.png (Very High Resolution)

Assets Zip File Submission

- READ Submission Instructions Carefully
- Zipped Assets File
  - Folder Name: urban-science-assets
  - Contents
    - urban-science-page.docx
    - urban-science-artwork-1.png (Very High Resolution)
    - urban-science-artwork-2.png (Very High Resolution)
    - urban-science-artwork-3.png (Very High Resolution)
  - Delete unused placeholder artwork files.
  - Zip Filename: urban-science-assets.zip
- Upload to Microsoft Teams
  - General Channel File Space
  - Folder Named Design Day Booklet Assets Zip Files
  - Team's Private Channel File Space
  - Draft: Due 11:59 p.m., Tuesday, October 1. **← 5 Days ← New Due Date**
  - Artwork Clinic: Friday, October 4
  - Final: Due 11:59 p.m., Saturday, October 5. **← 8 Days**

Office 365 Word on Windows

- Open and Edit Team Page ONLY
  - Office 365 Word
  - On Windows
    - Natively
    - Capstone Lab VM
- Do NOT
  - Use Web Version of Word
  - Use Microsoft Teams' Version of Word
  - Open and/or Edit Collaboratively in Teams
  - Open and/or Edit with Apple's Pages or Google Docs
- See Syllabus
  - Editing Documents and Presentations Using Office 365
  - Read Carefully

DDB Artwork Feedback Clinic [1 of 3]

- Who?
  - Dr. D.
  - Artwork Person or Persons from Your Team
- What?
  - Design Day Booklet (DDB) Project Page
  - Feedback on Artwork
- Where?
  - Dr. D.'s Office
  - EB 3149
- When?
  - Friday, October 4
  - Same Schedule as Team Photos
- Why?
  - Have Best DDB Pages
  - Short Timeframe

Team Page

Template

Dr. D. Creates

[2 of 3]

3200/3300 Hallway | Third Floor, Computer Science and Engineering 8:00 a.m. – Noon | CSE498

Amazon

Employee Badge Image Validation Tool

Insert your project description here. Read the Design Day Booklet Page Instructions thoroughly, over and over.

Show paragraph marks and other hidden symbols by clicking the paragraph symbol (¶) in the Paragraph section of the ribbon above.

To start a new paragraph, insert a tab character at the beginning of the paragraph by typing control-tab. You should see a right arrow (→) appear.

You must use the Microsoft Windows version of Word. Do NOT even think about using anything else.

The first two or three lines must be about your client. The following is an example.

Auto-Owners Insurance is a Fortune 500 company that provides automotive, home, life and commercial insurance to nearly 3 million policyholders in 26 states.

Do NOT use phrases like "Our clients asked us to..." or "Our project is ..." when describing your project.

Do NOT use phrases like "Our software aims to..." or "Our software is designed to..." when describing your software.

Write everything in the present tense.

Do NOT write anything negative about your client like "Our client's current software is horrible; ours is better."

Read the Design Day Booklet Page Instructions thoroughly, over and over and over and over and over.

It's okay for a paragraph to have only one sentence as long as the sentence is long enough to take up at least 1.5 lines.

The last few lines (and only the last few lines) must contain technical details about your project. The following is an example.

The front end of our Amazon Video and Shopping Technology system is built using Angular 6, while the back end is implemented using PHP Laravel.

- To insert your artwork, right-click on this artwork (grey rectangle with text within the textbox) and select "Change Picture..."
- Put each piece of artwork in a separate artwork textbox.
- Do not change the textbox's red external borders. Use them as handles to move and resize the textbox. The red borders will be made invisible later.
- Delete the artwork textboxes that you do not need.
- Do not use more than four artwork textboxes.
- To layer overlapping textboxes, right-click on a textbox red border, and select "Bring to Front" or "Send to Back."

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amazon

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Arul Srivastava
Northville, Michigan

Katelyn Hurst
Grand Rapids, Michigan

Jack Hammond
Shelby Township, Michigan

Timmy Wu
Grand Rapids, Michigan

Khloe Hayes
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Amazon

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Ed O'Brien
Detroit, Michigan

Sean Whipple
Detroit, Michigan

PAGE N + 3

Team Page

Draft

Team Creates

Uploads to Teams

Design Day Booklet Assets Zip Files

Tuesday, October 1

Artwork Clinic

Friday, October 4

[3 of 3]

3200/3300 Hallway | Third Floor, Computer Science and Engineering 8:00 a.m. – Noon | CSE498

Amazon

Employee Badge Image Validation Tool

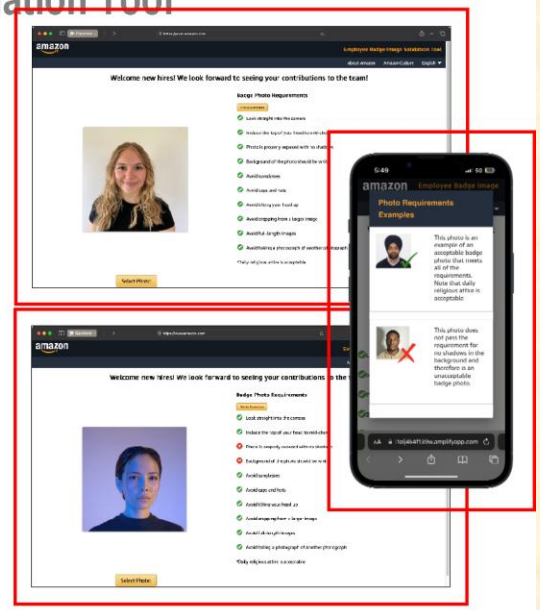
Amazon is a multinational technology company that has grown to become the world's largest retailer. Founded in 1994 by Jeff Bezos, Amazon has since expanded into various industries, including cloud computing, digital streaming and artificial intelligence.

Ensuring an efficient employee onboarding process is paramount to supporting Amazon's vision as Amazon has created more job opportunities than any other company in the past decade. An efficient onboarding process enables the onboarding employee to focus on transitioning without unnecessary delays or disruptions.

Currently, when Amazon hires a new employee, the onboarding employee must upload an image for their future employee badge to the employee badge verification system. Once uploaded, the photo is manually checked against the photo requirements and verified by the employee badge verification team. This process can take days for the new employee to receive feedback, and the new employee may find out they have to wait in a long line to retake the photo on their first day of work.

Our Employee Badge Verification Tool streamlines the new employee onboarding process by providing instant feedback on the new employees uploaded badge photo. Our system uses machine learning models on Amazon's Rekognition service to test the validity of the new uploaded photo against the specified requirements. This not only saves time for new hires, enabling them to start faster and transition more smoothly into their roles, but also allows Amazon to dedicate more resources to delivering quality services to their customers.

Our web application is responsive and scalable due to a robust set of Amazon Web Services. The front end is hosted on AWS Amplify and back-end requests are handled by API Gateway, Lambda, Rekogniton, and S3.



amazon

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Detroit, Michigan

Detroit Leadership
Detroit, Michigan

Stefan Najor
Detroit, Michigan

Ed O'Brien
Detroit, Michigan

Sean Whipple
Detroit, Michigan

PAGE N + 3

What's ahead?

[1 of 3]

- Upcoming Meetings
  - ~~09/26, Th: Design Day Booklet Production Process~~
  - 10/01, Tu: Creating and Giving Presentations
  - 10/01, Tu: Draft DD Booklet Asset Zip Files Due **← 5 Days ← New Due Date**
  - 10/03, Th: Resume Writing & Interviewing
  - 10/04, Fr: Artwork Clinic
    - 10:00 a.m. – 3:30 p.m., EB 3149
    - Same Schedule as Team Photos
    - Artwork Person or Persons from Your Team
  - 10/05, Sa: Final DD Booklet Asset Zip Files Due
  - 10/08, Tu: Alpha Presentations
  - 10/10, Th: Alpha Presentations
  - 10/15, Tu: Alpha Presentations
  - 10/17, Th: Alpha Presentations

    ⋮
  - 11/14, Th: Beta Presentations

What's ahead? [2 of 3]

Artwork Clinic Schedule, Friday, October 4

- 10:00 AM: Whirlpool
- 10:10 AM: Launch
- 10:20 AM: Magna VNNG
- 10:30 AM: Amazon
- 10:40 AM: Magna TDD4ES
- 10:50 AM: Urban Science
- 11:00 AM: DRIVEN-4
- 11:10 AM: Stryker IST
- 11:20 AM: Michigan State University CSE
- 11:30 AM: Union Pacific
- 11:40 AM: Kohl's
- 11:50 AM: Volkswagen
- 12:00 PM: RPM
- 12:10 PM: Roosevelt Innovations Knowledge Science
- 12:20 PM: GM RIS
- 01:10 PM: Anthropocene Institute
- 01:20 PM: Meijer
- 01:30 PM: Magna MADO
- 01:40 PM: Ally
- 01:50 PM: MSUFCU
- 02:00 PM: Magna WFG4ADAS
- 02:10 PM: Auto-Owners
- 02:20 PM: TechSmith
- 02:30 PM: GM WHMS
- 02:40 PM: Henry Ford Innovations RSVP
- 02:50 PM: Vectra
- 03:00 PM: Henry Ford Innovations RSE
- 03:10 PM: WK Kellogg's Co
- 03:20 PM: AbbVie
- 03:30 PM: HAP

What's ahead? [3 of 3]

- Capstone Due Dates / Deadlines
  - Published at Start of Semester
    - See Weekly Schedule
    - See Major Milestones
  - Immovable
    - Your team depends on you.
    - You must get your tasks done on time.
    - Plan well in advance.
    - If you are "stuck," ask for help sooner rather than later.
    - If you are not going to complete your tasks…
      - …tell your team well in advance of the deadline.
      - ….another team member will complete your task.
      - …your team may be told they no longer need to depend on you.