10/03: Design Day Booklet Production Process

The Capstone Experience
Dr. Wayne Dyksen
James Mariani

Department of Computer Science and Engineering
Michigan State University
Fall 2023
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.
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

• 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

• 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
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.

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

• Read the instructions carefully.
• Take 2 to 3 screenshot(s) of working software.
  ▪ Use eye-catching examples.
  ▪ Avoid boring or trivial things.
    o Splash Screens
    o 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
  ▪ See https://mockuphone.com.
  ▪ Eliminate shadows.
Artwork

- 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 Instructions
- Capture and provide very high-resolution images.
- Preserve aspect ratios.
- Crop to eliminate transparent “borders.”
- Eliminate all surrounding “whitespace.”
- Use paint.net.
- See examples.
  - The Capstone Experience Booklets
  - Design Day Booklet Feedback, Fall 2022
  - Design Day Booklet Feedback, Spring 2023
  - Previous Design Day Booklets (Design Day > Booklet)
  - MSU Men’s Basketball
- Make a Checklist ← Have I mentioned this yet?
Too Much White Whitespace

What’s wrong with white whitespace?

Too Much Transparent Whitespace

Nicely Cropped Transparent Whitespace
Artwork Whitespace Issues

Key: Think about our graphical designer inserting, resizing and positioning your artwork (png files).

Look Identical
Artwork Whitespace Issues

Border Shows Transparent Whitespace

Designer selects all and makes them all 3” high.
Artwork Whitespace Issues

Select All. Rescale to 3” Height.
Download Design Day Artwork Whitespace Tester
Artwork Border Issues

Vehicle Payments | Request a Payoff Quote

Make a Payment

Transactions

Edit Auto Pay

Payment Accounts

Request a Payoff Quote

Your lease return estimate if you end your lease on or before May 24, 2018 is:

$2,407.82

What to keep in mind when returning your vehicle:

- You’ll be asked to sign an odometer statement.
- All recalls applicable to your vehicle must be completed.
- If there’s a surplus from the vehicle’s sale, we’ll adjust your payoffs as described in your lease agreement. See your agreement for details.
- This estimate is only valid if your vehicle is returned on or before May 24, 2018.

Print

©2009-2018 Ally Financial Inc.
Artwork Border Issues

Issue Fixed Border Added
Artwork Border Issues
Artwork Border Issues

Issue Fixed
Border Added
Artwork Border Issues
Artwork Border Issues

Issue Fixed
Border Added
Adding Artwork Border Issues

Original Screen Capture PNGs
Adding Artwork Border Issues

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

Looks fine, right? What’s wrong?
Key: Graphic designer does not copy-and-paste artwork from the Word document. Graphic designer inserts PNG files into Design Day booklet.
Artwork PNG files inserted to Design Day booklet by graphic designer.
Adding Artwork Border Issues

Border Added to Both Artwork PNGs using PowerPoint
Adding Artwork Border Issues

Graphic Designer Imports Artwork PNGs into InDesign
Artwork Who’s on first?
Artwork Who’s on first?

Changed color of textbox background.

Artwork has transparent background.
Artwork Who’s on first?

Changed color of textbox background.

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

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.

When 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, picture, and ratings. A viewer can easily purchase any product simply by clicking on the conveniently provided link to Amazon.

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

Michigan State University
Team Members (left to right): Linhson Feng, Brandon Zhao, USA; Ben Nowakowski, Oak Park, Michigan; Patrick McComb, Northfield, Michigan; Ian McGregor, Dearborn, Michigan; Han Wang, Nor, Michigan

Amazon
Project Sponsors: Garrett Gower, Dearborn, Michigan; Derek Gehardt, Detroit, Michigan; Kyle King, Dearborn, Michigan; Pete Pfeiffer, Detroit, Michigan
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 U.S., 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 view 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, checking availability of vehicles based on dates, our app provides an 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.

**Michigan State University Team Members (left to right):**

Alex Patton  
Huntsville, Michigan

Drew Gage  
Dexter, Michigan

Emilio Castillo  
Lansing, Michigan

Klint Knecher  
Lansing, Michigan

Chad Krause  
Nashville, Michigan

**Aptiv Project Sponsor:**

Chris Lussemho  
Troy, Michigan

Joe Lynn  
Troy, Michigan

Bobbie Magzete  
Troy, Michigan

Jim Gussewberry  
Troy, Michigan
The Capstone Experience

Design Day Booklet Production Process

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**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 22 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 quickly 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 the 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.
Artwork Example

Proofpoint
Improved Detonation of Evasive Malware

Headquartered in Sunnyvale, California, Proofpoint provides cybersecurity to many organizations, including Fortune 500 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 the malware, making it undetectable to the sandbox environment, which causes it to terminate. 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 sample being tested as well as see the evasive techniques being used. Both harmless and harmful evade results are presented.

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

Michigan State University Team Members (left to right):
Jack Messersi, Benton Hills, Michigan
Teo Park, Canton, Michigan
Sean Joseph, Grant, Michigan
Ryan Gallant, Midland, Michigan
Ian Murray, Midland, Michigan

Proofpoint Project Team:
Lillani Alejo, Sunnyvale, California
Kris Gee, Sunnyvale, California
Brad Woodberg, Troy, Michigan

Proofpoint™
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 28,000 members and over $1.3 billion in assets, MSUCFU is the largest university-based credit union in the world.

MSUCFU 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 services maintain MSUCFU’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 MSUCFU 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 MSUCFU such as branch hours, current loan rates and the location of the nearest ATM or Branch.

Our companion administrative web portal enables MSUCFU 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.

[Image of team members and Siri interface]
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
Michigan State University Men's Basketball
Spartan Basketball Player Timer

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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 on 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.

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Spartan Basketball Player Timer is written in Visual Basic. The underlying database is Microsoft Access.
The DD Booklet Production Process

1. Zip Folders to Teams
2. Zip Folders From Teams
3. Edit Artwork Dr. D
4. Edit Project Descriptions James, TMs & Jill
5. Merge Edits Dr. D.
6. Zip Folders To Designer
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.

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.
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.

Michigan State University
Team Members (left to right)
- Josh Pedelisi
- Patrick Willig
- Jack Good
- Naperville, Illinois
- Laura Emonga
- Warren, Michigan
- Andrew Ferguson
- Port Huron, Michigan

United Airlines
Project Sponsors
- Amanda Arce
  Chicago, Illinois
- Craig Bennett
  Cincinnati, Ohio
- Rick Brown
  Chicago, Illinois
- Lynette Daniels
  Houston, Texas
- Tom Wilburn
  Chicago, Illinois

PAGE 24
United Airlines
Training Scheduling and Optimization System II

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United Airlines Project Sponsors
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Craig Bennett
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Rick Brown
Chicago, Illinois
Lynda McCrady
Housten, Texas
Tom Williams
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Franklin, Michigan
Jack Geenhuis
Naperville, Illinois
Laura Emilia
Lansing, Michigan
Andrew Ferguson
Lansing, Michigan
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 successfull flights, it is essential to have properly trained personnel. United’s Technical Operations division has 80 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 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 on 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 initiated 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 on an app service on Azure Cloud Platform.

Michigan State University
Team Members (left to right):
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Andrew Ferguson
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United Airlines
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Chicago, Illinois
Craig Bennett
Chicago, Illinois
Rick Brown
Chicago, Illinois
Lynda Rechelski
Houston, Texas
Tom Williams
Chicago, Illinois
United Airlines
Training Scheduling and Optimization System II

United Airlines is the world's second largest airline company, operating 6,600 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 50 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 schedules to schedule instructors, students, and courses across the country.

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Microsoft State University
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Andrea Ferguson
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Rick Brown
Chicago, Illinois
Lynda McDaniel
Houston, Texas
Tom Wilson
Chicago, Illinois
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.

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Andrew Ferguson
Lansing, Michigan

United Airlines
Project Sponsors
Amos Arna
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Craig Bennett
Chicago, Illinois
Rick Brown
Chicago, Illinois
Lynda Buchanan
Houston, Texas
Tom Wilkins
Chicago, Illinois
3
Artwork Draft
From Team
To Dr. D.

What’s wrong with this artwork?
Artwork Draft Feedback by Dr. D.

Dr. D. duplicated existing artwork to illustrate requested update.
3
Artwork Update
From Team
To Dr. D.

United Airlines
Training Scheduling and Optimization System II

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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 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.

Michigan State University
Team Members (left to right)
Josh Peczeshki
Patrick Michigan
Jack Goode
Naperville, Illinois
Laura Evduga
Losina, Michigan
Andrew Ferguson
Lawrence, Michigan

United Airlines
Project Sponsors
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Craig Bennett
Chicago, Illinois
Rick Brown
Chicago, Illinois
Jamie Hill
Chicago, Illinois
Lynda Robertson
Nashville, Tennessee
Tom Wilson
Chicago, Illinois
United Airlines
Training Scheduling and Optimization System II

United Airlines is the world's second largest airline company, operating over 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.

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Michigan State University
Team Members (left to right):
- Jordan Wellner
- Franklin, Michigan
- Jack Sneke
- Naperville, Illinois
- Laura Danila
- Livonia, Michigan
- Andrew Ferguson
- Livonia, Michigan

United Airlines
Project Sponsors
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  Chicago, Illinois
- Craig Bennett
  Chicago, Illinois
- Rick Brown
  Chicago, Illinois
- Jamie Hill
  Chicago, Illinois
- Lynda McDaniel
  Houston, Texas
- Tom Wilson
  Chicago, Illinois

The Capstone Experience
## Design Day Booklet Production Process

### October 2023

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October Break
Zipped Assets Folder

- 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
  - amazon-artwork-2.png
  - amazon-artwork-3.png
  - amazon-artwork-4.png
Submission

• READ Submission Instructions Carefully
• Zipped Assets Folder
  ▪ Folder Name: urban-science-assets
  ▪ Contents
    o urban-science-page.docx
    o urban-science-artwork-1.png (Very High Resolution)
    o urban-science-artwork-2.png (Very High Resolution)
    o 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
  ▪ Due 11:59 p.m., Saturday, October 7. ← 4 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

• See Syllabus
  ▪ “28. Editing Documents and Presentations Using Office 365”
  ▪ Read Carefully
What’s ahead?

• Upcoming Meetings
  ▪ 10/03: Design Day Booklet Production Process
  ▪ 10/05: Creating and Giving Presentations
  ▪ 10/06: Artwork Clinic
    (9:00 a.m. – Noon, EB 3149)
  ▪ 10/10: Alpha Presentations
  ▪ 10/12: Alpha Presentations
  ▪ 10/17: Alpha Presentations
  ▪ 11/14: Beta Presentations
What’s ahead?

• Important Dates for Planning
  ▪ 10/07: Design Day Booklet Zip File Due
  ▪ 10/09: Alpha Slide Decks Due
  ▪ 10/10: Alpha Presentations Start
    Start Working Towards Beta Presentations
  ▪ 10/17: Last Day to Submit Artwork Updates
  ▪ 11/13: Beta Slide Decks Due
  ▪ 11/14: Beta Presentations Start
    Start Working on Project Videos
What’s ahead?

• Capstone Due Dates / Deadlines
  ▪ Published at Start of Semester
    o See Weekly Schedule
    o See Major Milestones
  ▪ Immovable
    o Your team depends on you.
    o You must get your tasks done on time.
    o Plan well in advance.
    o If you are “stuck,” ask for help sooner rather than later.
    o 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.