Application for 2017 University of California Larry L. Sautter Award for Innovation in Information Technology

Drones

Project Title	**Drones**
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The Problem

In March 2016 the Federal Aviation Administration authorized the University of California's Section 333 exemption request to use certain Unmanned Aircraft Systems (also known as UAS or drones) for surveying, studying, monitoring, mapping, aerial photographing and a variety of other research purposes.

The UC Center of Excellence on UAS Safety was charged with ensuring that drones flown on UC campuses comply with FAA regulations and standards as well as UC policies. Many campus organizations – from engineering students to agricultural researchers to facility management – were eager to put drones to use.

The center needed a quickly-deployed, simple-to-use UAS management system that would meet all FAA requirements as well as ensure that each campus could track its drone use.

The Solution: Drones

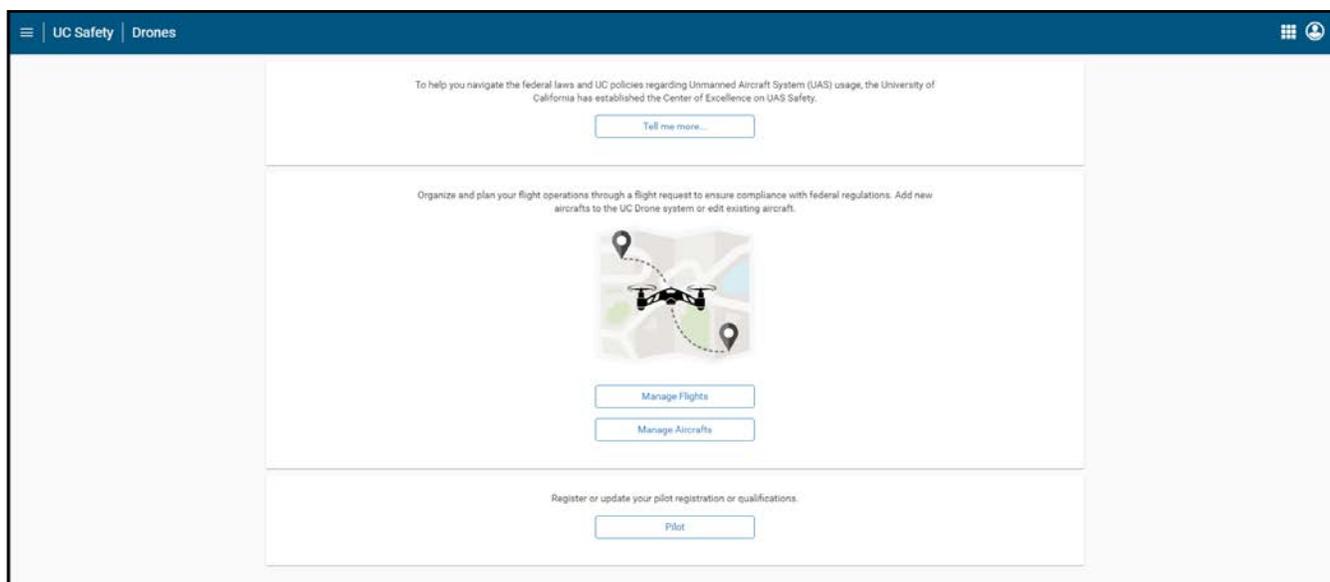Drones allows users to register UAS, pilots and request flights with the UC Center of Excellence on UAS Safety.

Figure 1: Landing Page of Drones

Features include:

- Once a pilot and aircraft has been registered into the system, they become searchable

- Search for existing flight requests or reports by status or date

- Ability to create a new flight request

- Latitude and longitude can be entered manually or by using the provided map, which includes filters for standard or satellite view, different controlled airspaces and types of airports

- Ability to attach documents, for example, flight plans and crowd control plans

- Ability to check flight request status

- Once a flight request has been approved, users can create a flight report that can then be edited to indicate any changes due to weather or ground hazards as well as equipment malfunctions, takeoff and landing damages and accidents and mishaps

- Ability to clone flight requests or reports, for repeat flight requests

Figure 2: Register and Aircraft Page

Released in September 2016, Drones has already been adopted by 8 of the 10 UC campuses.

Each of our products comes with a variety of implementation tools that institutions can choose to simplify the adoption process. This includes templated electronic and/or print-ready announcements outlining the product, PowerPoint presentations about the product, print-ready or electronic tutorials and "how-to" videos that demonstrate how to complete certain tasks.

Drones Dashboard

The Drones Dashboard was developed for the Center of Excellence on Unmanned Aircraft System

Safety. The goal for the dashboard is to provide a comprehensive view of all flights and aircraft

information. The first view of the Drones Dashboard allows users to quickly identify the location of

flights through the Dashboard's interactive map and also gain insight as to the purpose and duration

of flights. The second view of the Dashboard is focused more on the aircrafts. Users can identify the

different models of aircrafts along with the total number pilots and pilot location. All of this data

helps UC better understand the usage of drones and ensure that campuses are adhering to drone
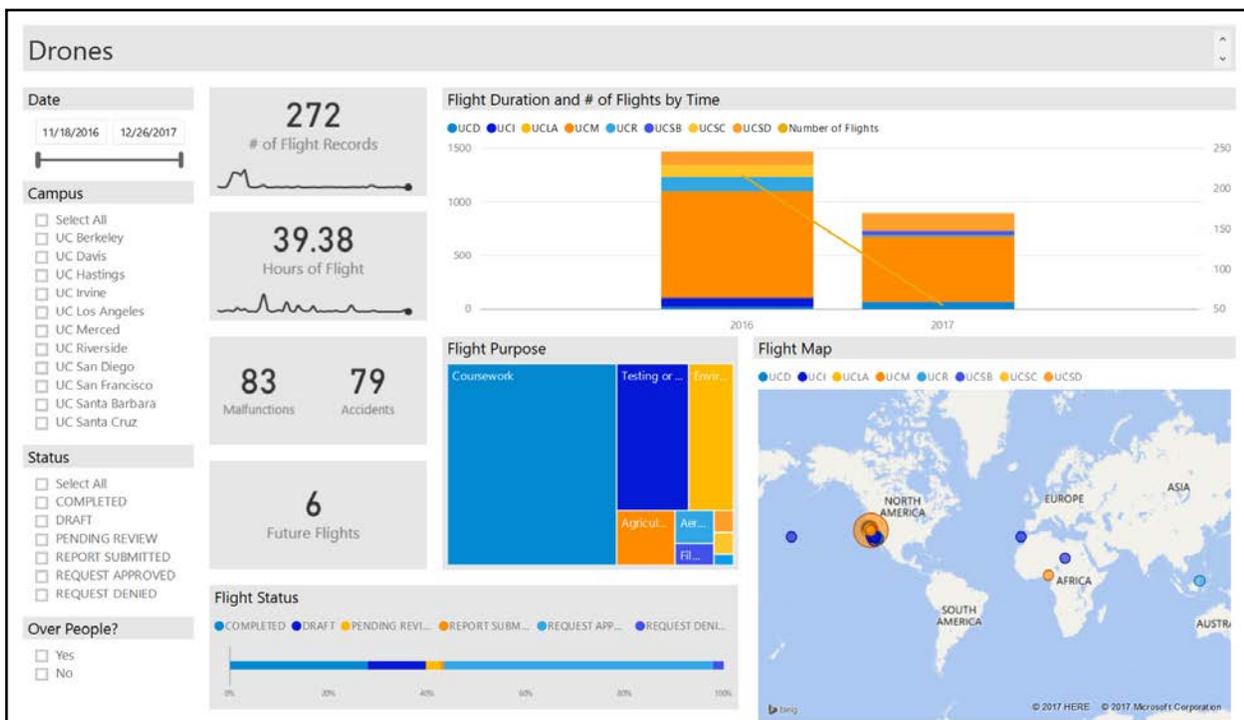
policies and meeting state and federal requirements.

Figure 3: Dashboard featuring flights

Technology Used

Drones was built using Agile methodologies: Iterative, test-driven development in one-week sprints
utilizing a combination of Scrum and Kanban. Through this approach the team was able to deliver
critical business value quickly and support the Center of Excellence for UAS Safety.

The application was built with HTML5, SASS, Material Design, Bootstrap, Angular 2 with Typescript, NodeJS with Express, MongoDB and the AirMap API. The application is load balanced and uses a stateless authentication strategy. The Dashboards are developed using Power BI, the leading self-service Business Intelligence platform from Microsoft.

Relevant URLs:

- https://ehs.ucop.edu/drones/
- https://ehs.ucop.edu/analytics/