Application for 2015 University of California Larry L. Sautter Award for Innovation in Information Technology

Project Title: UC Safety Profile

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Project Description
The UC Safety suite of applications is designed to assist Environmental Health and Safety staff and university researchers in managing different aspects of work done in facilities while helping to meet state and federal regulations. These applications have in common much of the same information including people, locations and chemicals.

UC Safety Profile centralizes and publishes the shared information to provide systems users with consistent data that is entered once and used often. The UC Safety Profile application middleware publishes shared data for the UC Safety Suite of Technologies, which provides researchers with a comprehensive way to manage workplace risks, meet institutional, state and federal requirements and easily manage data associated with their labs. Principal Investigators, lab managers, lab workers and Environmental Health and Safety staff can manage the people and building data for their research facility in one convenient location. Entering lab data is as simple as “once and done.” Once entered, the data is available throughout the suite. Not only is this time saving for researchers, it also improves the quality of the data and the administrative management of both campus and systemwide data.

How It Works
User experience and user interface are key components of Profile. The developers wanted to provide users with a clean, easy-to-navigate site that serves as a launching pad to the UC Safety Suite of Technologies. When a user logs in to Profile they can see at a glance their basic contact information, can add and remove phone numbers and emails, and can even identify their preferred method of contact. The left navigation pane provides a summary of the user’s Groups, labs or facilities where they are the Responsible Person (RP), and Membership, labs or facilities where they are assigned as Delegates (able to act on the RP’s behalf) or Authorized Users (basic system privileges assigned to lab staff). Users can also access My Training from this view to see an overview of the Learning Management System (LMS) training they have completed that pertains to their work in a lab.
Selecting a lab from *Groups or Membership* provides the user with a detailed view of lab staff, their roles, lab locations and LMS training data for all lab staff. RPs, their Delegates and EH&S staff can update the roster here, add and remove locations and see specific LMS training data for their entire staff. Users can create a new lab from this view and rename an existing lab. Campus administrators can also reassign the ownership of an existing lab or facility to a new RP using the *Transfer Group Ownership* wizard.

![Figure 1. UC Safety Profile User Home Page](image1)

![Figure 2. View of lab staff and roles](image2)
One of the most important features of UC Safety Profile is that it is also integrated with LMS for each campus. In the past, the process required for Principal Investigators to determine what relevant training their lab workers had completed was tedious and time-consuming. The PI had to log in to LMS, find their lab worker, scroll through all of the courses he or she had taken and then pick out the courses related to laboratory safety. A typical UC lab worker can accumulate scores of these courses in just a few years. This process would have to be repeated for each worker.

Profile now does the work for the PI, pulling out LMS course data that each worker in a lab has completed. Courses included in this view are specifically chosen by each campus’ EH&S staff to be relevant to risk and lab safety. This provides a specialized view of only the courses that matter, making it quickly and easily accessible for EH&S, safety inspectors and lab staff. This quick view of course data also helps PIs to identify compliance by their lab staff to ensure the safety of everyone doing research.
Criteria

Innovative: UC Safety Profile is innovative both in terms of what it does and how it looks. Much like a person’s social media profile, UC Safety Profile collects all the information relative to a user’s lab work (roles, groups, training, contact information, useful technologies, etc.) and displays it in one user-friendly, easy-to-use location.

Operational Efficiency and Usability/Accessibility: As demonstrated above, the UC Safety Profile application saves considerable time for the user, who no longer has to log in to each application individually and re-enter information again and again. It also saves time for the PI, who can quickly learn if his or her lab workers are up-to-date on required trainings.

Sharable: UC Safety Profile is used by all 10 campuses and five medical centers. It is integrated with the university’s payroll system (PPS) and also has building information for all 15 locations.

Interoperable: As demonstrated above, UC Safety Profile is integrated with all of the UC Safety technologies and the LMS and PPS for each campus.

Collaboration: UC Safety Profile had the benefit of input from the development teams for each of our technologies. Each of those teams received input from their technology’s workgroups, which receive input from representatives from throughout the UC system. In addition, UC Profile gathered feedback from EH&S directors and PIs from throughout the system.

Assessable success criteria: Profile currently has over 85,000 users from all 10 campuses, the medical centers and Agriculture and Natural Resources (ANR).

Partnerships

"As a nearly daily user of Profile, I greatly appreciate its functionality. Profile allows me to assist faculty members that are unwilling or unable to make the necessary changes to their laboratory roster or locations and assign the delegate role, if requested. Having all the information available in one convenient location allows me to efficiently assist PIs without having to jump between multiple programs. In addition to assisting PIs with roster and location changes, I have also been able to add preferred e-mail addresses and provide information about members of their laboratory groups that have not completed the required training. PIs greatly appreciate this immediate assistance which relieves them of having to spend the time to log on to make the necessary changes. This appreciation has had a very positive impact on the relationship between EH&S and the research community."

-Sue Littlefield, Laboratory Safety Review Program Manager, UC Davis

Technology Used

Profile provides a window into the user data managed by Core Services, our middleware stack. Therefore, the technology stack for Profile includes both front-end technologies for the user interface and server-side technologies for communication with Core Services.
Front End Technologies

- JavaScript
- AngularJS for dynamic web application design
- Bootstrap for compatibility with mobile devices

Server Side Technologies

- Java
- Spring MVC
- SOAP Web Services (JAX-WS)
- Apache Tomcat
- Linux application servers
- Mule ESB for proxy services

Development Tools

- SoapUI for raw web service testing
- Various flavors of a Java integrated development environments (IDE)
- JUnit for unit and integration testing
- Protractor and Karma for JavaScript testing
- JIRA for Agile board management
- JIRA for issue/task management
- Confluence for team collaboration and documentation
- Bitbucket for source control

Maintenance Tools

- Pingdom and Icinga for availability monitoring
- ELK Stack (Elasticsearch, Logstash, Kibana) for logging and log analysis

Implementation Timeframe

UC Risk & Safety Services uses the Agile method of software development, which employs short iterations of development and frequent testing for user acceptance. The original release was March 2013, but since that time, the development team has continually added new releases and features based on user feedback.

Relevant URLs:

- https://ehs.ucop.edu/auth-demo/
- http://risksafety.universityofcalifornia.edu/p/ucsp/