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## 2018 Sautter Award Submission: Enhanced data and service sharing through innovative campus collaboration

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### **Submitter**

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### **Team**

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### **Short Statement**

UC Santa Barbara's distributed decentralized IT organizational structure has led to a strong need for knowledge sharing and collaboration, as well as a need to share functionality and data across departments to facilitate application development. Through the formation of a Campus Application Development Group, UCSB implemented a campus-wide API Management platform as a secure, efficient, and standard way of sharing data and services.

### **Problem Statement**

UCSB IT departments operate within their own boundaries to support assigned business functions, and implement and maintain homegrown and vendor solutions. Multiple technologies and methodologies are used in developing these solutions and components, as developers work within their respective technical environments and projects. Campus identified the need to provide a setting for IT professionals to collaborate on application development and data needs; to discuss common architectural and integration methodologies; and to develop a community based on shared experiences and roles.

In late 2016, the Campus Application Development group was formed with the larger responsibility of guiding campus wide application development practices and to provide a forum for developers across campus to collaborate. As the developers started to share their knowledge, projects, successes and challenges, they quickly identified the need for a better data and services sharing methodology for application development.

Through the years, our IT staff have come up with a variety of ways to provide the data necessary for departments to function successfully and to supplement the functionality provided by the Student Information System, Financial, Payroll, and other systems. This has left a landscape where data flows through automated or manual file extracts, direct database access, one-off web services, or in some cases even the dreaded copy/paste-by-hand processes. Due to the nature of each integration being a one-off solution negotiated to address a particular business need, there has been no standardization. Each new data sharing need led to an ad-hoc solution, which may or may not have been documented. There was also no centralized listing of these solutions. Without a standardized and centralized integration technology, anyone who later needed to figure out what and how data flowed between departments had to embark on a time-consuming and exhausting process of interviewing stakeholders and gathering scattered documentation. This also meant there was no standard practice in governance of these integrations. Without a standard process for tracking, approving, and managing access to data feeds, there was no way to readily audit the who/where/when of data sharing.

### **Solution**

Unlike previous projects on campus, we took a new approach. The newly formed cross-sectional team of campus application developers was charged with tackling the problems described above. This shift in approach garnered a wider breadth of knowledge and “in the trenches” experiences to bear when analyzing the problem.

This multi-disciplinary group looked at their usage of web services as a principle, which solved many of the difficulties within the problem space. Their analysis led to the selection of a full-featured API Management Platform as the central tool around which a comprehensive solution could be developed. The group evaluated multiple API Management tools over a series of months before finally selecting [Apigee](#).

The team identified the following goals for the new solution:

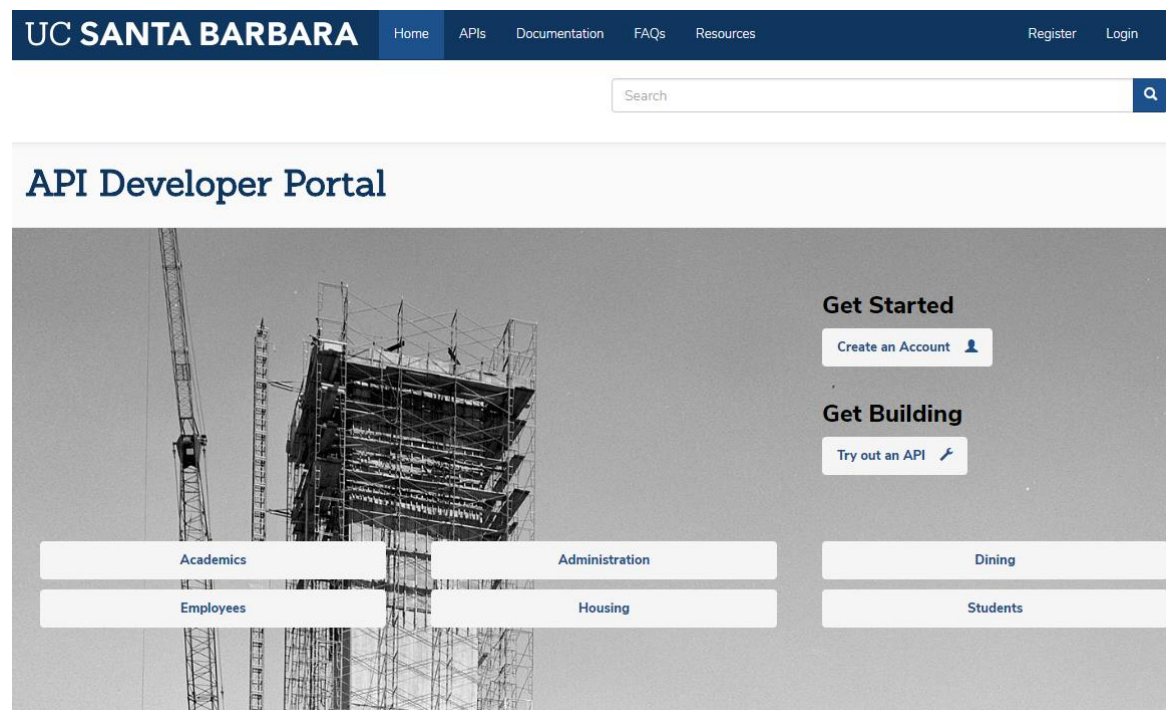
- Provide real time integrations between campus systems
- Provide a platform for standardized data and services sharing
- Standardize on common data understanding and usage across campus
- Enhance the data security through better data management and governance processes
- Eliminate the need to store data in shadow systems on campus
- Save development time by reducing one-off solutions for data integrations
- Implement a cloud-based solution to eliminate the need for systems administrator support, hardware and server infrastructure

The nature of this project required a more creative approach in collaboration methodologies, software and project management tools. During the implementation, we established issue tracking and code repositories for the team, provided by one of the IT organizations on campus. We established regular weekly working meetings in a neutral location at the UCSB Library that allowed the implementation team members to focus on this project and collaboratively work through the implementation. Different

areas of the tool required different skills and the developers were able to focus on their areas of expertise while supplementing each-others' skills to make this effort possible. Together we defined common API development and publishing standards, with a goal to be transparent to the user where the data is coming from. The API organization established is system agnostic and focuses on the campus entities and not on organizational boundaries.

The distributed team nature of this solution requires a higher level of governance with a structured approval process to ensure that data and services are secure and well-managed. The team is developing workflows to manage these processes and to establish the API management and governance structure.

<https://developer.ucsb.edu/>



The new API Management solution achieved by this project is a significant innovation for UCSB. The goals of the solution are:

- Providing a one-stop data and services listing for cross departmental data and services.
- Unifying the data understanding across campus, with everyone using the same source and definitions.
- Minimizing or eliminating the need for “one-off” solutions.
- Reducing the effort required to build applications that rely on data from diverse campus wide sources and allow developers to focus on delivering business value.
- Controlling access and rate limitations, allowing us to safely provide access to a diverse set of applications. Even student developed applications can be granted access to non-identifying institutional data for projects and research, while not affecting the load on the critical back-end systems.

In its first stage, we have made available a subset of course, student, employee, and housing data for application development. As the system matures and gains traction, we will be expanding the API catalog and extending the platform use for data analytics and other API-based services.

### **Collaboration**

This project was conducted in collaboration between the following UCSB IT departments: Enterprise Technology Services, Student Information Systems and Technology, Library IT, Academic Affairs IT, Administrative and Residential IT, Biological Sciences IT, College of Letters and Sciences IT, and College of Engineering IT. The innovative type of collaboration in this project was a key to its success. Each IT department freely donated their staffs' time to serve on the implementation team.

Robust API management platforms can be very expensive. By collaborating on campus level, we were able to achieve efficiency in addition to providing standardization and technical knowledge sharing between developers.

### **Customer Impact**

Through this initiative, customers will have better access to timely data for their business solutions, which will allow them to better serve researchers, faculty, staff, and students and gain efficiencies in performing campus functions. In many cases, due to the manual nature of current processes, the data refreshes happen infrequently, even a few times a quarter, which can be an impediment for timely decision making. In addition, this solution will help us to self-document campus data use and improve the governance around it. The reusability of the APIs will provide efficiencies for developers, minimizing the need for one-off data integration solutions for different systems on campus.

### **Deployment Timeline**

- Fall 2016 – formed the Campus Application Development Group
- January – June 2017 – API Management tool selection
- July – October 2017 – Contract signed with Google for Apigee
- November 2017 – April 2018 – Tool implementation
- April 2018 – API Management Tool and initial set of APIs released in production
- May 2018 and forward – Governance and additional APIs

### **Technology**

UCSB implemented Google's Apigee Edge product for an API Management Platform. It is a cloud solution, comprised of an API gateway, an admin portal, and a developer portal.

The API admin portal has capabilities for API development and publishing, monitoring, rate limiting, usage statistics, and user management. <https://apigee.com/edge>

The developer portal is Drupal-based, and is used for API discovery, account registration, application account creation, API access requests, and testing. The developer portal is flexible and can be extended to meet our specific needs. <https://developer.ucsb.edu/>

## **Measuring Project Success**

Released only recently, the API system is already starting to see interest in the campus community. Its potential to improve the system integration infrastructure on campus is significant and the ultimate success will be measured in several years. With that in mind, we are judging success by:

- The selection of Apigee as the UCSB API Management platform and the successful release of the tool in production
- The release of our first APIs, the development of new APIs, and the process of transitioning departmental APIs and their customers to the platform
- IT professionals planning new system integrations to utilize the new platform
- The effort to improve data governance and provide development efficiencies