

Sautter Award Submission for Berkeley Online Advising (BOA)

“BOA has changed the way that we work with our students and has quickly become our one stop shop for getting a unique and information-rich snapshot of a student’s current and historical academic profile.”

Sharon Mueller, Director of Advising and Policy,
Engineering Student Services, College of Engineering, UC Berkeley

Project Title

Berkeley Online Advising (BOA)

Submitter’s Name, Title, and Contact Info

Shawna Dark, Chief Academic Technology Officer & Executive Director, Research, Teaching, and Learning, University of California, Berkeley, shawna.dark@berkeley.edu

Project Team

Oliver Heyer, Director, Research, Teaching, and Learning
Vanessa Kaskiris, Manager, Research, Teaching, and Learning
Steven Williams, Product Manager, Research, Teaching, and Learning
Sandeep Jayaprakash, Data Scientist, Research, Teaching, and Learning
Darlene Kawase, Operations, Research, Teaching, and Learning
Flint Hahn, UX Designer, Research, Teaching, and Learning
John Crossman, Developer, Research, Teaching, and Learning
Paul Kerschen, Developer, Research, Teaching, and Learning
Anne Lyttle, Developer, Research, Teaching, and Learning
Paul Farestveit, Quality Assurance, Research, Teaching, and Learning
Ray Davis (retired), Developer, Research, Teaching, and Learning

Project Partners

- Athletic Study Center (ASC)
- College of Engineering (COE)
- College of Letters and Science (L&S)
- Division of Equity & Inclusion
- Office of Undergraduate Admissions (OUA)
- Undergraduate Advisors Across UCB

Project Statement (1 Sentence)

Berkeley Online Advising (BOA) is a highly secure locally built cohort-based advising and student success platform that provides analytics and complex data visualizations in real time from data sources that include the campus Learning Management System, the Student Information System, and a number of other previously siloed data locations on campus.

Project Narrative (*Max 5 Pages*)

Berkeley Online Advising, or BOA, was developed by UC Berkeley's Projects, Development, and Operations (PDO) Group within Research, Teaching, and Learning to support UC Berkeley's undergraduate advising staff in their role of supporting and promoting student success. BOA integrates student records from a wide range of campus sources including the Canvas learning management system (LMS), student information system (SIS) records, and previously siloed departmental databases that have never before been available campus wide; it then adds value to this data by introducing data-driven alerts and real-time information about student academic progress.

BOA is a native cloud application deployed on Amazon Web Services (AWS). Its underlying data lake aggregates records from multiple, disparate campus sources into S3 buckets, which are then transformed into Redshift views. It is highly flexible, enabling rapid addition or swap out of services and technologies. BOA's data infrastructure can be extended to support many additional projects and initiatives, including NGDLE applications, data analytics, artificial intelligence, and machine learning.

The PDO Group uses a mature Agile methodology to continuously improve and enhance BOA, with decisions about the platform driven by ongoing feedback from users about their requirements and needs. PDO works in four-week sprints, with healthy collaboration between product/project managers, user interface / experience designers, software developers, and operations staff including QA. Use of the Agile methodology and process helps the team to prioritize enhancements that have the greatest impact on unmet user needs, and allows the team to quickly adapt and adjust the roadmap as needed to rapidly respond to emerging themes or issues.

Legacy advising tools at UC Berkeley required undergraduate academic advisors to look up students one at a time. With advising caseloads in the hundreds for most advisors, this model did not scale to meet the needs of a university as large as UC Berkeley. BOA enables advisors to instantly build real-time, data-driven cohorts of students who meet criteria of interest. Additionally, BOA automatically generates real-time alerts for advisors based on known risk criteria including academic probation, extended inactivity in the learning management system, or a deficient grade assigned mid-semester. This data-driven model, unifying known risk factors from multiple data sources, allows advisors to quickly identify students who may be at risk academically in the current term, which could have been unknown to the advisor until it was too late to intervene prior to the availability of BOA. This allows advisors to apply their subject matter expertise in working with students, and make an immediate intervention in support of the students' ability to maintain normal academic progress. In addition to BOA's ability to help advisors identify risk in more personalized and student-centered ways, BOA cohorts can also be used to identify high-achieving students who meet various criteria, helping advisors connect these students with opportunities that may be available to them.

Student progress towards earning a degree is a key metric for the university to measure outcomes. When students do not successfully complete a course, this can delay their time-to-degree, impact their eligibility for scholarships and other programs, and reduce their likelihood of degree completion. BOA's synthesis of student records from multiple sources promotes advisors' ability to understand a

student's individual risk compared to their peers. Specifically, BOA is the first campus system at UC Berkeley that allows academic advisors to have a student-centered view of real-time engagement in the LMS. BOA adapts to set a threshold of "typical" engagement for each individual course, in order to reflect the breadth of ways the LMS is used; when a student's engagement or assignment performance diverge from their classmates, BOA alerts advisors of this discrepancy. BOA also synthesizes campus and LMS data in a visualized matrix view for each class, allowing advisors to identify trends in a particular course, track individual student performance compared to their peers, and explore correlations between data points that encompass both the LMS and traditional student information systems.

The implementation of a complex but flexible data infrastructure permits BOA to seamlessly display data and content from numerous sources, ranging from standards-compliant educational technology tools to purpose-built departmental databases. BOA's users no longer need to access multiple information systems to gain a comprehensive understanding of a student's historical and present academic performance, but can instead access these records in a single, unified platform. In addition to aggregating data from existing services, BOA also offers new transactional functionality allowing advisors to more easily capture information about their interactions with students. By capturing advising notes in BOA and making them part of the larger data lake, Berkeley has a unique opportunity to more comprehensively understand how student behaviors correlate with outcomes, and how advising interventions support student success.

By expanding the community of learning analytics practitioners at UC Berkeley to include academic advisors, BOA broadens the impact of student data and learning analytics. In addition to its functional benefits, BOA utilizes a cloud-based data lake architecture, which has become a shared campus resource that offers a new model for data architecture, with the ability to support a broad range of innovations that can be delivered by Next Generation Digital Learning Environments (NGDLE), an emerging model for educational technology platforms that prioritizes interoperability of multiple purpose-built tools.

The history and roadmap of BOA have been driven by deep engagement and genuine partnerships with campus departments supporting student success. In the initial 2017-18 pilot, BOA was focused on the unmet needs of advising staff in the Athletic Study Center, who support the academic success of student athletes. These advising staff required real-time data to identify and intervene with at-risk students, to help maintain their eligibility for team sports and student athlete financial aid.

During this initial pilot, leadership in UC Berkeley's College of Engineering (CoE) also saw the benefits of this real-time data to support their students, and help their advising staff more effectively prioritize limited resources to their advising caseload of hundreds of students each. In 2018-19, BOA expanded to become available to CoE advisors, and began to more deeply integrate student data from previously-siloed campus and departmental databases. As a result of the initial success with ASC and CoE, BOA became a campus wide service for undergraduate advisors in Summer 2019, and added new transactional capabilities including advising notes. **As of May 2020, over 1000**

advising staff campus wide can now access BOA, and have authored over 54,000 unique and new advising notes in BOA since August 2019.

To sustain and enhance these partnerships with the advising community, the BOA team has also focused on developing new strategic points of collaboration within the campus IT community, bringing together IT stakeholders from groups including the Student Information System, Enterprise Data Warehouse, Office of the Registrar, New Student Services, and the Centers for Educational Equity and Excellence. These groups are all engaged with the current state and future of BOA, prioritizing and identifying future opportunities for new features and other platform enhancements. Critical, strategic conversations about advising policy and practice are now taking place regularly as a means to complement and enhance the core BOA platform.

In addition to its impact on student success, BOA has also helped shape the campuswide IT roadmap at UC Berkeley. During 2019-20, BOA represented two of Campus IT’s top 20 priorities: Student Advising Support, which is being enhanced via the development and delivery of BOA; and the Enterprise Data Lake, which is the AWS infrastructure that was originally designed to support BOA’s aggregation of student records and will be instrumented in central IT to next serve Institutional Research needs across campus. Campus IT leadership has described BOA’s Data Lake as “an essential first step in making a next-generation data integration and analytics environment available to the broader campus” and “an essential component of UC Berkeley’s cloud strategy.” The BOA team continues to engage with the Enterprise Data Warehouse on long-term stewardship of the data lake, and the opportunities it creates to continue becoming a more data-driven organization.

BOA Timeline, Metrics & Deliverables

The history and roadmap of BOA have been driven by partnerships with campus departments supporting student success.

	Spring 2018	Fall 2018	Summer 2019	Fall 2019	Spring 2021
Athletic Study Center Pilot <ul style="list-style-type: none"> ● Real Time Academic Progress ● Student Profile ● Group/Cohort View 					
College of Engineering Pilot <ul style="list-style-type: none"> ● Academic Outcome Metrics Improved ● Departmental Data Incorporated ● Advisor Dashboard 					
College of Letters & Science <ul style="list-style-type: none"> ● Improve transactional experience ● Provide previously unavailable data ● Complement campus data strategy 					

Division of Equity & Inclusion <ul style="list-style-type: none"> • Visibility into incoming student populations • Enhance Admissions and Equity & Inclusion partnerships 					
Undergraduate Advisors Across Campus <ul style="list-style-type: none"> • Common good solution available to all undergraduate campus advisors 					
College of Engineering Part II <ul style="list-style-type: none"> • Additional feature exploration • Focus on a campus wide value add 					

BOA Demo

Overview of BOA features and functionality:

https://youtu.be/S_g-7Hf5Q8s

Additional BOA Information

BOA Project Page

<https://tinyurl.com/yb3u4ddm>

BOA Service Page

<https://dls.berkeley.edu/services/boa>

BOA Architecture

