Application for State of California Awards for Innovation in Higher Education

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List of Participants:
South Orange County Community College District. Partnerships with other California community colleges and districts are being developed pending notification of this grant.

Abstract:
California community colleges have led the nation in providing access to over two million students annually. However, configuring our system to prioritize access and choice has had the unintended effect of presenting a bewildering number of choices to students with inadequate resources to provide personalized assistance. This sets students up for failure, especially students from historically-underrepresented groups and at-risk populations, who need more help, possess less academic acculturation, and have lower success rates. Students differ vastly in the amount of support they receive from institutions, and colleges lack the resources to address this problem.

The District Information Technology (DIT) department of the South Orange County Community College District (SOCCCD) has created the most comprehensive, cutting-edge suite of student success tools in the nation. Our Student Success Suite (S3) helps students select the appropriate courses to complete their personal academic goals, identifies at-risk students and nudges them into relevant college resources, and provides students with the right information at the right time to make informed decisions.

Adding a Student Success Roadmap will extend the abilities of the Student Success Suite by personalizing and adapting the delivery of information and services to each and every student in a uniquely "human" way. Additional assistance will be provided to advance student success rates for historically underrepresented groups, foster youth and other at-risk populations. Because software tools are highly scalable and moldable, our ultimate goal is to make it available to all students in California.
Representative of Fiscal Agent:
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I assure that I have read and support this application. I understand that, if this application is chosen for an award, South Orange County Community College District will serve as the fiscal agent for the award and that the responsibility of the fiscal agent includes distribution of funds to any other participants in the application pursuant to any agreement between the participants. I also understand that, if this application is chosen for an award, the Committee on Awards for Innovation in Higher Education may request submittal of reports or other information.

Dr. Debra L. Fitzsimons
Interim Chancellor
1. **From the perspective of students, what is the problem you are trying to solve?**

The problem we are trying to solve is that of relatively low student success rates—as measured by retention, persistence, certificate/degree attainment or transfer to a baccalaureate institution—in the California community colleges, whose 2.1 million students comprise the single largest system of higher education in the nation.

The California community colleges have led the nation in providing access to over two million students annually. However, configuring our system to prioritize access and choice has had the unintended effect of presenting a bewildering number of choices to students in tandem with inadequate resources to provide personalized assistance. This sets students up for failure, especially students from historically-underrepresented groups and at-risk populations, who need more help, possess less academic acculturation, and have lower success rates.

**Over the past ten years, the District Information Technology (DIT) department of the South Orange County Community College District (SOCCCD) has created the most comprehensive, cutting-edge suite of student success tools in the nation.** Our software helps students select the appropriate courses to complete their personal academic goals, identifies at-risk students and nudges them into receiving relevant college resources, and provides students with the right information at the right time so they make more informed decisions. We’ve demonstrated our systems to State legislators, U.S. Congressional staff, and the U.S. Department of Education; won numerous state and national awards; and, most recently collaborated with Workday, Inc., on the design of their global cloud-based student information system. Our **Student Success Suite (S3)** includes:

1. A custom-created **Student Information System (SIS)**
2. **MySite** – our enterprise web portal
3. **My Academic Plan (MAP)** – a student/counselor academic planning tool
4. **Sherpa** – a student success recommendation and personalization engine
5. The **inFORM Data Warehouse** – provides state reporting, management dashboards and self-serve analytics
6. **Predictive Analytics** – a machine-learning-based mathematical model capable of predicting letter grades for every student in every course in our catalog
7. **Student Success Dashboard** – a dashboard of personalized success metrics for every student
8. **SmartSchedule** – a class schedule that integrates with MAP and Sherpa to provide a personalized guide for every student

Now we are seeking funding to build upon that success by making our products "smarter" and "more human." The resulting **Student Success Roadmap** will offer integrated decision support, not only for our district’s 68,000 students per year but for all California community college students.
2. What is the innovation?

At South Orange County Community College District, we’re at the forefront in bringing cutting-edge technology from the consumer space into higher education. Our continuing goal is to enable student success by building the most comprehensive suite of student success tools in existence anywhere. We are well on our way to that goal, as evidenced by local performance outcomes and a plethora of statewide and national awards:

This innovation will extend an existing suite of award-winning student success software by personalizing and adapting the delivery of information and services to each and every student. We call it the **Student Success Roadmap** because it will pull together factors that contribute to student success into one personalized and customized pathway for each and every student, integrating information from:

- Admissions
- MySite web portal information
- Orientation
- Advisement
- Assessment
- My Academic Plan
- Financial Aid
- Counseling appointments
- Career/Major guidance
- EOPS (if applicable)
- DSPS (if applicable)
- International Students (if applicable)
- Child care
- Veterans Services (if applicable)
- Class Schedule
- Shopping Cart
- Registration
- Bursars Office (if applicable)

- Bookstore
- Parking permit
- Campus maps with class locations highlighted
- Learning Management System
- Directions to off-campus locations
- Library services
- Campus events
- Campus life - clubs, student government, athletics, etc.
- Transfer Center
- Tutoring
- Honors program
- Career Center
- Awards application
- Graduation application
- Commencement information
Our ultimate aim is to make this software available to over two million students throughout the California community colleges. This is not an idle boast. In the past 10 years, we have created a comprehensive, cutting-edge suite of award-winning student success tools, including:

**SIS and MySite**
The “face” of our custom-created Student Information System (SIS) is MySite, our enterprise web portal. Our SIS won Campus Technology magazine’s “Innovators” award in 2010.

**My Academic Plan (MAP)**
This system won a state innovation award and has been used by students to create over 512,000 academic plans since it went online in April 2007.

**Sherpa**
Envisioned as a course selection tool, we realized that if we built it as a recommendation architecture rather than a specialized system it could provide helpful services on a wide range of decisions. The recommendations are delivered as “nudges” or “nods” and can be consumed through a feed on the student web portal, email message, text message, text-to-speech audio, to-do list task, or an important message pushed to the relevant page in the portal. All of these nudges can also be accessed through a mobile app. We named the system “Sherpa” because we thought it an apt metaphor for the guides that help mountain climbers achieve their goals.

**Student Success Dashboard**
This focuses on getting the maximum amount of relevant information in front of the student in one place. The dashboard contains a set of widgets that display personal and relevant information for each student, including a calendar pre-loaded with all of the class sessions and important dates, a listing of current classes including a GPS-enabled guide to their specific class location, important upcoming dates including registration appointments and campus holidays, a news feed with college events, a to-do list and a general information widget that displays academic goal and progress.

**The inFORM Data Warehouse and Predictive Analytics**
Our data warehouse provides state reporting, management dashboards, and self-service analytics. In addition, we worked with a bicoastal team of data scientists to produce a machine-learning-based mathematical model that can predict a grade for every student in every course!

**SmartSchedule**
We produced the original version of SmartSchedule in 2005 and won a Technology Focus award from the Chancellor’s Office of the California Community Colleges. SmartSchedule 2.0 has a cutting-edge user experience, faceted search, integration with academic planning, and other features to help students succeed.
3. How will you implement this innovation?

We will implement this innovation using the successful methodology we have developed and utilized with our past innovations. In an industry where the majority of large-scale software projects fail, we have evolved a very mature, successful, recognized process for creating groundbreaking academic software.

We believe there are three simple reasons for our continued success:

1) **Agile software development:** Agile software development is both flexible and inclusive. It emphasizes the involvement of the user community which keeps us focused on their needs and accountable to them for what we deliver. It’s also highly flexible so we can adapt the products as they are developed. We’ve found this methodology to be highly successful in the projects we have built to date.

2) **Our Public/Private Partnership:** we use a hybrid model where experts from nine different consultancies work in tandem with SOCCCD developers. This enables us to scale our software development efforts up or down as the project velocity dictates and we can bring in just the right expertise at just the right time to supplement our core teams.

3) **Our Student Design Team:** One of the biggest factors in our success has been our student design team. Every year we hire students to join our development effort and they are deeply embedded in our process. They are in the room when we do initial brainstorming, are the first ones to review the mockups, test the software as soon as it’s available, assist us in conducting focus groups with other students, and produce help videos to explain the new system to our student population when the systems go live. Our student design teams have been invaluable in keeping us focused on our highest priority – student success.

Our design process includes regular meetings between students and software developers. District representatives Bob Bramucci, Jim Gaston and student Ari Nur brief Congressional and agency staff in the Gold Room of the House of Representatives.
Timeline
Our past, present and future timeline for the Student Success Suite:

2000
- MySite (enterprise web portal)

2002
- SmartSchedule

2007 – 2010
- My Academic Plan (MAP)
- Student Information System (SIS)
- MySite 2.0

2010 – 2012
- Sherpa

2015 – 2016
- MySite 3.0
- Student Success Dashboard
- Predictive Analytics

2016 – 2017
- SmartSchedule 2.0
- Begin discussions with potential hosting partners
- Begin discussions with potential pilot institutions

2017 – 2018
- Attain funding to scale systems
- Student Success Roadmap
- Select pilot institutions

2018 – 2019
- Finalize hosting partner
- Pilot colleges come online – begin with SmartSchedule and Student Success Roadmap due to lower risk and higher impact

2019 – 2020
- Make available to all CA community colleges
- Long-term funding model in place
- Begin scaling of other student success suite modules

2020+
- Continued enhancement of student success suite
- New innovations

SmartSchedule 2.0 uses GPS to guide students to classes
Sherpa’s Closed Class Assistant intervenes to help students find classes
4. How does this innovation align with other efforts you are undertaking, and how does it relate to other efforts in higher education in California?

This work is part of our long-term vision of software creation—a vision we have been enacting for over a decade:

In addition, this work directly aligns with major higher education initiatives in California. This effort aligns directly with the renewed focus on **Student Success** in the California community colleges, the emphasis on **Pathways** (a term referring to the streamlining of decision-making by offering students clear pathways of course-taking to reduce mistakes resulting from too many options), and the work on **Basic Skills** and **Multiple Measures**. For example, as part of our **Predictive Analytics** project, we conducted research to validate the state’s Multiple Measures approach. (It works!)

We believe our vision is distinct from other applications your committee will receive. It is likely the only one that aims to build and integrate a set of diverse, automated computer applications that will synergistically work to improve student success via mass customization, recommendation engines, machine learning, and other technologies that have transformed the consumer space. Our students are already accustomed to using these technologies every day to communicate, order products, summon rides, etc., but seldom encounter them when they step on a college campus. If funded, this project will bring these technologies into the student experience in a way that can scale to millions of students.
5. How could this innovation be scaled up within the setting in which you work and replicated in other areas in California?

One of the big advantages we’ll have in scaling up our systems within California is that they have been built specifically for a large California community multi-college district. We know many of our peers across the state have struggled to successfully implement similar vendor products because they don’t fit the institution’s needs. Thanks to our agile and inclusive process, this has not been an issue for us.

The biggest scaling issue facing us is the sheer size of the California community college system and the problems inherent with software able to handle over two million users (particularly with handling the load that spikes at the beginning and end of every semester).

Our plan for scaling our systems has two major components:

1) **Find the right hosting partner.** We know the limits of our expertise and our goal is to find a partner that has experience with the scale that would be involved in a statewide system. We have already conducted discussions with several vendors in this space and we believe the CCC technology center would be an ideal partner. Our preliminary discussions with them are promising, and getting the funding from this innovation grant could be the last piece of the puzzle for us.

2) **Start with a pilot program.** We recently conducted a presentation for our region’s (Region 8) community colleges, and in April 2017 we have presentations scheduled at the CCC Chief Information Systems Officer Association (CISOA) conference and the League for Innovation in Community Colleges conference. We’ll be discussing our plans at these conferences and will be looking for colleges interested in joining our pilot program. We’ll build on the success of the pilot, learn from any challenges, and then scale up for the entire state of California.
6. What evidence suggests that this innovation would be effective in addressing the problem identified in your response to Item 1 and implemented successfully?

Every day, our students use software from companies such as Amazon, Netflix, Pandora, and Facebook – software that is automated, customized and personalized. Our students get the kind of experience we are proposing in every other area of their lives except for higher education, where they get generic systems that don’t respond to their personal needs.

We also have evidence in the successful usage within our district of the systems we have developed. Every transaction in our systems is logged and here are a few sample statistics:

- Since MAP went online in April 2007 it has been used to create over 512,000 academic plans.
- Sherpa has sent over 4.7 million emails and over 675,000 text messages.
- More than 39,000 enrollments resulted directly from the Sherpa registration closed class assistant.
- There were 473,181 logins to the Student Success Dashboard from September 2016 through January 2017.

Additional validation has come from state and national awards our systems have won:

- State Chancellor’s Office Technology Focus Award – 2015 (Sherpa)
- Campus Technology Magazine Innovators Award – 2012 (Sherpa)
- Blackboard Catalyst Award – 2011 (Sherpa)
- Campus Technology Magazine Innovators Award – 2010 (SIS)
- State Chancellor’s Office Technology Focus Award – 2007 (MAP)
- State Chancellor’s Office Technology Focus Award – 2005 (SmartSchedule)
- National Digital Education Achievement Award – 2004 (MySite eServices)
- State Chancellor’s Office Technology Focus Award – 2001 (MySite Web Portal)

Finally, we’re confident our approach will work because it has been validated by a national research project conducted by WestEd (the western arm of the U.S. Department of Education) and MDRC. The report can be accessed at: https://ies.ed.gov/ncee/edlabs/regions/west/pdf/REL_2017204.pdf.

One of the key findings of this research concluded:

*The enhanced MAP system was implemented as intended by the South Orange County Community College District and Saddleback College. Most notably, the nudges were successfully delivered, and the counseling workshops were conducted according to the schedule and plan.*
7. What information will you use to assess the success of this innovation in addressing the program’s goals, and how will that assessment be used to inform future efforts?

When designing our products, we are very deliberate about logging data that can be utilized later to assess the effectiveness of the work. An example of our built-in tracking capability can be seen in the image below. This shows the profile tracker embedded in Sherpa, which captures the number of students in every profile each day.

We use this data to examine trends that might be indicators of the success or failure of our student success efforts. This example shows students who have a hold placed on their record because they have not yet created a comprehensive academic plan in MAP. We can use this data to push nudges out to the students, warning them they will not be able to register in the subsequent semester. My Academic Plan will automatically lift the hold from their record once they have a comprehensive plan and they will automatically be removed from the profile by Sherpa.

Aside from the built-in logging capabilities of each individual system, all of the data is imported every day into our inFORM data warehouse system so our district and college research offices can assess the success or failure of our systems. Recently our data warehouse team has begun using Tableau, a tool that provides rich visualizations to create dashboards of student success data for college decision-makers.
8. What resources or commitments, or both, do you currently have to support this innovation, and how will implementation of this innovation be sustainable over the long-term?

We are proud of the work we have accomplished at SOCCCD with our student success software, and the commitment of our district to this work can be seen in the millions of dollars our board and local taxpayers have invested in it over the last ten years. The work we have accomplished is even more remarkable when taken into account that the team working on it also has day-to-day operational responsibilities of a district IT office. If we are awarded this funding, we will dedicate resources so a team can work on this project full-time.

Our plan is to use this innovation award money to increase both the functionality and scope of our systems and lay the groundwork to make them available to other colleges. Those colleges would pay a reasonable maintenance fee for hosting costs and to keep the systems current with future enhancements. This plan would lessen the risk, help more students, and create a funding model that will be sustainable over the long term. We view the innovation award funding as seed money to scale up our system and lay the foundation for a long term viable partnership with like-minded colleges. Building and maintaining systems that promote student success by reducing the time to completion via active, personalized guidance, will ultimately save the state of California millions of dollars by preventing students from taking classes that don’t advance their educational goals.

There are risks involved in any software development effort, but we believe that scaling up our systems to include other colleges will benefit more students and minimize risk by spreading it across additional institutions. Our goal is to bring together a consortium of colleges that contribute their ideas, resources, and funding and ultimately share in the product of our collaboration in a long-term, financially viable manner.