

Application for 2016 University of California Larry L. Sautter Award for Innovation in Information Technology

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Project Title: The University of California Information Center

Product Web Address: <http://universityofcalifornia.edu/infocenter>

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On Behalf of: University of California Office of the President (UCOP), Institutional Research and Academic Planning (IRAP) in collaboration with:

1. UCOP Information Technology Services (ITS) – Data Services
2. UCOP Communications
3. UCOP Application Services
4. UCOP Diversity and Engagement
5. UCOP Office of Research and Graduate Studies

I. Project Leaders and Team Members

The Institutional Research and Academic Planning department strongly supports and advocates for collaborative work throughout the University of California, particularly within the Office of the President. The major factors that led to the success of this project include communication, collaboration, and teamwork, a strong commitment to individual and collective creativity, data quality and accuracy.

- Pamela Brown, UCOP IRAP – *Project Sponsor*
- Charles Masten, UCOP IRAP – *Project Co-Sponsor*
- Ola Popoola, UCOP IRAP – *Project Manager*
- Ryan Chan, UCOP IRAP – *Lead Analytics Contributor*
- Chris Furgiuele, UCOP IRAP – *Lead Analytics Contributor*
- Charlie Drucker, UCOP IRAP – *Lead Content Contributor*
- Tongshan Chan, UCOP IRAP – *Lead Content Contributor*
- Susannah McCormick, UCOP IRAP – *Lead Analytics Contributor*
- Yang Yang, UCOP IRAP – *Lead Analytics Contributor*
- Darin Jensen, UCOP IRAP – *Analytics Contributor*
- Christopher Brooks, UCOP IRAP – *Analytics Contributor*
- Annette Holmes, UCOP IRAP – *Analytics Contributor*
- Kathleen Merchant, UCOP IRAP - *Analytics Contributor*
- Al Course, UCOP ITS/Data Services – *Technical Contributor*
- Shaloo Jeswani, UCOP ITS/Data Services – *Technical Contributor*
- Hooman Pejman, UCOP ITS/Data Services – *Technical Contributor*
- Chris Handy, UCOP ITS/Data Services – *Technical Contributor*
- Abhishek Ailneni, UCOP ITS/Data Services – *Technical Contributor*
- Krishna Malipatel, UCOP ITS/Data Services – *Technical Contributor*
- Jungwon Huh, UCOP Diversity and Engagement – *Analytics Contributor*
- Rebecca Stanek-Rykoff, UCOP Office of Research and Graduate Studies – *Analytics Contributor*
- Vincent Cook, UCOP Office of Research and Graduate Studies – *Analytics Contributor*
- Vance Tran, UCOP Communications – *Web Development Contributor*
- Carolyn McMillan, UCOP Communications – *Communications/Editing Contributor*

II. Executive Summary

University of California leadership consistently needs quick, clear and easy access to information to support communication and advocacy efforts. Due to this demand, the University is continually influenced by both internal and external factors to re-evaluate its decision-making processes and the supporting Business Intelligence (BI) and analytics technology infrastructure. Although UC has done a lot of work in making pertinent information that concerns the institution available to the public, there was still a need to create a single central source of information about the university that serves the UC community and the public at large. With the increased interest in analytics and data visualization techniques, the opportunity arose to create a one-of-a-kind website that will be the main avenue used to present information about UC. The goal for this site was for it to employ data visualizations that will be narrative in nature and tell the UC story simply and succinctly.

III. Why data visualizations?

There is overwhelming evidence regarding the benefits of data visualization. When working with massive amounts of data, one challenge is how to display results of data exploration and analysis in a way that is not overwhelming. It is often said that a picture is said to be worth a thousand words. Visualizations present the opportunity to learn things from collective data that can help us make better decisions; take smarter actions and operate more efficiently. One of the best ways to discern important data relationships is through advanced analysis and high-performance data visualization. When results of analyses are presented in ways that showcase patterns and allow querying and exploration, people across all levels of the organization can make faster, more effective decisions.

IV. Vision

The vision of the Office of Institutional Research and Academic Planning (IRAP) was to build a new UC Information Center aligned with the University of California website that provides a single source of truth regarding UC data and information to both internal and external UC stakeholders. This exercise was intended to promote collaboration and democratization of data; cultivate a culture of analytics and develop an infrastructure that supports go-anywhere analytics.

It was the hope of UCOP IRAP that the new UC Information Center will eventually provide the ability to develop both public-facing and secured internal dashboards to prevent any compromise to personal identifiable information of students, staff and faculty. The ultimate goal is to handle as many routine requests for data and information as possible via this public web-site and to provide actionable information to internal UC users.

V. Business Case

There were multiple core issues that provided a valid business case for the creation of the new UC Information Center. Some of the issues are:

- Multiple inconsistent views of UC data
- The need for accountability and transparency
- Sporadic development of data sharing websites within UC
- Lack of access to quick and clear information
- Delayed timeline of the path from data to actionable information
- Huge learning curve involved in mastering business intelligence reporting tools
- The dependence on IT resources to create simple reports and dashboards for business consumption

VI. Software of Choice

The award-winning business intelligence software for faster data analysis and better business dashboards called Tableau was selected for the implementation. This software provided the opportunity to see UC data clearly using its data visualization capabilities. With this choice, we discovered that there is no need for extensive deployment and waiting; just instant results. The team started on a limited budget with the Tableau Desktop Software and the free Tableau Public Edition which is a free hosting server product for putting results on the public web for the whole world to see.

UCOP IRAP recently acquired Tableau Enterprise Server to allow distributed browser-based and mobile users seamless interaction with Tableau workbooks published to the server from Tableau Desktop. The server software is designed to scale up to hundreds of thousands of users. The team found it easy to set up and even easier to run.

VII. Realized Business Opportunities

1. The opportunity for the Office of Institutional Research and Academic Planning to continue the commitment to accountability and excellence.
2. The opportunity to create and foster greater collaboration and partnership between UCOP IRAP and other departments and campuses in the area of data analytics.
3. The ability to provide an increased awareness of UC stories using a highly visual and interactive website.
4. Aligned with the University of California website, the site is a representative of the UC system as a whole which opened the door for new relationships to be built with other UC offices that wanted to achieve the same result with their data.
5. The highly interactive and visual interface has played a key role in the broader adoption of Business Intelligence technology and processes throughout the UC system.
6. Continued work on the new UC Information Center has helped UC in providing the right information to the right people at the right time.
7. The site has created the opportunity to place data into the hands of the people who need it; enabling them to answer their own questions quickly and easily.

VIII. Data Infrastructure Improvements

Our first step was to create a sustainable data infrastructure that would allow a consistent and sustainable data feed to the UC Information Center. We successfully implement and continue to enhance the new University of California Data Warehouse (UCDW). This data warehouse is implemented using the IBM DB2 technology with current plans to upgrade the environment to leverage the IBM DB2 BLU Acceleration which is a revolutionary in-memory technology that is designed for high-performance analytics and data-intensive reporting. We also created simple content area focused data marts based on the data within the data warehouse star schema environment to allow simple queries to be created via the Tableau Desktop software.

The UCOP IRAP office receives about 500 input files a year from all ten UC campus sites. These data files are reviewed, validated and certified prior to loading the data into the star-schema University of California Data Warehouse using in-house developed Extraction, Transform and Load processes (ETL). A reliable and sustainable data validation framework was created by leveraging the IBM Cognos tool to certify data prior to

loading into both the data warehouse and the data marts used to feed the Information Center to help ensure accuracy and data integrity.

IX. The UC Information Center Overview

The University of California Information Center hosts a variety of analytics around the following areas:

- Admissions
- Enrollment
- Degree Outcomes
- Faculty and Staff
- Graduate Experience
- Institutional Performance
- Diversity
- Undergraduate Experience
- Diversity
- UC in the Community

X. The Design

The University of California Information Center is designed to present information in three distinct ways:

- **UC Storyboard**: The story boards will be focused on data-driven narratives that weave multiple data visualizations to support a story line.
- **UC Dashboard**: Dashboards will provide easy access and functionality to empower users to get answers to frequently asked questions. Leveraging sample Data from other peer institutions such as Texas A&M and Cornell University, IRAP will begin by creating functional dashboards in specific subject areas by extracting information from our Decision Support System (UCOP's data warehouse) and providing one version of the truth.
- **UC Data Tables**: The static and interactive reports will provide an avenue for IRAP users both internal and external to view and download data from online data tables in different ways.

XI. Development/Deployment Timeline

- Project Initiation – 8/1/2014
- Infrastructure Development – First Phase Completed – 12/19/2014
- Beta Site Development and Deployment – 12/19/2014
- Production Site 'Go-Live' – 3/31/2015

Note: Post 'go-live', there are three releases a year – March, July and December.

XII. Key Performance Indexes

The usage of the site is continually monitored and measured using Google Analytics. The usage analytics gathered provided the opportunity to direct improvements in future releases towards the kind of information that viewers really wanted to see. The information center pages get tens of thousands of hits per month and we have saved enormous staff time and created great efficiencies by reducing the time spent responding to data requests. Performance was also measured internally within UCOP IRAP by how well we accomplished the following goals:

- **Teaming** - Fostering a high performance team
- **Framework Development** – Creation of solid frameworks that help support the sustainability of the site.
- **Community of Practice** – Creation of an environment that promotes data-driven decision making.

XIII. Impact

Many of the data visualizations available have been used in a variety of ways. Some examples of utilization are as follows:

1. The CCC dashboard was included in discussions about transfer pathways – highlighting the fact that UC attracts students from across the state. This visualization has been shared at multiple counselors' conferences including the annual UC Counselors Conference 2015.
 - <http://universityofcalifornia.edu/infocenter/california-community-college-enrollments-uc>
2. Value Added dashboard allowed us to pull national scorecard data and show how UC compares to other 4-year institutions. It demonstrates that UC is affordable, provides greater access for underrepresented minorities (URM) and first generation students.
 - <http://universityofcalifornia.edu/infocenter/national-value-added-and-scorecard-comparison>
3. Summer dashboard has been used to support enrollment planning and discussions about campuses.
 - <http://universityofcalifornia.edu/infocenter/summer-enrollment>
4. The Research Sponsorship at UC has been used to highlight UC as the world's largest academic research system to further communicate that UC is more than a degree issuing institution during budget negotiations.
 - <http://universityofcalifornia.edu/infocenter/research-sponsorship-uc>
5. The Admissions by Source School and Undergraduate Admissions data tables are being used by high school and community college counselors to advise students on admissions into a UC campus.
 - <http://universityofcalifornia.edu/infocenter/admissions-residency-and-ethnicity>
 - <http://universityofcalifornia.edu/infocenter/admissions-source-school>
6. The UC Contribution to California storyboard has been instrumental in communicating the variety of ways by which the UC system contributes to the State of California to state legislators.
 - <http://universityofcalifornia.edu/infocenter/ucs-contribution-state-california>

Please visit the University of California Information Center at: <http://universityofcalifornia.edu/infocenter>