University of California
Larry L. Sautter Award Submission

Education Technology IT Services Suite & Operating Model

School of Pharmacy
University of California, San Francisco

Submitted By:

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1. Project Title

School of Pharmacy Education Technology Services Suite & Operating Model

Innovation in Educational Technology at the School of Pharmacy, University of California, San Francisco

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**4. Project Sponsors**

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5. Project Significance

Objective

Create the UCSF School of Pharmacy’s collaborative Educational Technology Services Suite and Operating Support solution designed to efficiently innovate for a 5 year lifecycle.

Context

With organization wide support, late in 2009, UCSF Chancellor Susan Desmond-Hellmann initiated “Operational Excellence” at UCSF in an effort to improve efficiency, while preserving innovation. From the onset, Mary Anne Koda-Kimble, dean of the #1 Ranked, UCSF School of Pharmacy (School), has positioned the School to be an early adopter, innovator, and leader in this process.

For the School IT and administration teams, this project challenged technologists and administrative staff to collaboratively integrate “best of breed”, solutions that tightly align with educational goals. The IT innovation here is gained by collaboratively adding educational and business value at predictable, comparatively low cost, when compared to doing a more traditional departmental IT project.

Leveraging UCSF Operations Excellence goals, industry trends, interdisciplinary education, collaboration within UCSF, and state of the art technologies; the following goals were created.

Goal

Define and initiate the School’s 5 year plan to cost effectively and innovatively deploy a new integrated Educational Technology application services portfolio and associated operating model. The solution must have at least the following attributes:

- Leverage interdisciplinary initiatives across UCSF
- Be on par or better than peer medical education EdTech operations support systems
- Provide unified data mart and compliance reporting, meeting UCSF’s rigorous Pharmacy Education accreditation requirements
- Improve the educational experience and be directly relevant to the needs of teachers and learners; faculty and students
- Empower operations staff to self-administer content to accomplish specific, measurable, operating objectives
- Provide curriculum wide reporting and courseware re-use capabilities
- Provide standardized instruments and evaluation methodologies
- Provide detailed, easy to understand, actionable analytics and key performance indicators to guide curriculum re-engineering efforts
- Meet users where they want to get information and be accessible on via the internet via major browsers, and eventually any internet connected device (pda, tablet, pc), in compliance with regulatory standards
provide social learning portals that meet students “socially” where they want to get information and promote interaction and store data for later review
• integrate and collaborate with UCSF wide IT functional units such ITS, SOM EdTech, UCSF ETS, UCSF Library, both technically and operationally
• exceed UCSF wide IT standards for uptime, authentication, data exchange, reporting and business intelligence
• collaborate with industry leading SaaS evaluation providers such as E-Value
• provide a School “Center of Excellence” for support and training of EdTech
• provide high value with predictable, budgeted, cost over 5 years that iteratively improves its alignment with business and administration goals over time

6. Project Background

At the dean’s direction and in preparation for the School’s 2012 PharmD ACPE Accreditation process; re-engineering of the operations and technologies associated with the teaching and learning function was initiated. This service area is generally referred to as the School’s EdTech and administration functions. Under the faculty leadership of Dr. Tina Brock, Associate Dean of Teaching and Learning, Dr. Mitra Assemi, Associate Dean for Accreditation; several IT and operations initiatives were launched to improve the EdTech Application Services.

A School interdepartmental and UCSF wide interdisciplinary team was assembled comprised of educators, students, administrators, and IT professionals. The following opportunities/challenges were observed by the team:

Opportunities and Challenges
• positive attitude and momentum for change within the team
• central focus on teaching and learning and curriculum management systems
• key staff retirement (Manager, Educational Administration)
• faculty and administrative staff desire to change and adopt new technologies, take on additional work
• expected difficulties with early stage, early adopter technologies
• competing, reactionary “High Urgency, High Importance” priorities for staff
• historically non-centralized approach to PharmD Program administration
• historically non-centralized approach to educational technology (little to none existed)
• historically less focus on partnership with the UCSF School of Medicine and uniform systems rollout
• lack of clear Service Level Agreements, process for feature requests, etc.
• lack of focus partnering with SOM and Library technology staff as service providers
• high amount of logistical work, which is being learned as we go, associated with supporting these systems
• lack of documentation for process, procedure, and in place technologies
• lack or reporting for EdTech systems
• lack of operations support systems (ticketing, etc)
• lack of centralized, agreed upon document management and collaboration systems
• unclear roles and responsibilities for Educational Technology and operations support
• unclear project ownership, engagement manager, and project management roles for intermingled educational and technical systems forcing significant change to stakeholder behavior
• lack of wireless networks in classroom areas
• existing technical solution(s) for EdTech are out-dated, expensive, and discombobulated. Most (if not all) can benefit by leveraging state of the art technologies for many functions such as curriculum management, course support, lecture capture, evaluation, systems/data integration, and analytics/reporting

7. Project Description

Process

After the initial assessment, an interdepartmental, UCSF wide, collaborative team organized, summarized, and synthesized data, attitudes and beliefs of various stakeholders about the UCSF, School of Pharmacy Educational Technologies and operations. This effort was combined with an analysis of peer institutions and other groups within UCSF, as well as the higher education Educational Technology markets.

A consensus recommendation was formed by not only School of Pharmacy stakeholders, but also UCSF wide Educational Technology stakeholders and IT governance committees. This provided the foundation for a School wide, and eventually, for a UCSF wide, shared Educational Technology Services Suite and Center of Excellence to be created within the School.

Project Outcomes

Based on the above challenges, the team defined the following outcomes for the new systems and operating groups:

- **Learning**
  - Improved learning management
  - Improved video conferencing and class presentation recording
  - Improved student services
  - Improved quality of education
  - Increased collaboration
  - Improved overall satisfaction
  - Improved content capture/Streaming
  - Integration of new, state of the art, technologies

- **Administrative**
  - High value, predictable, sustainable costs
  - Reduction of paper processes
  - Increased efficiency of data flow administratively and for students
  - Better compliance with certification and licensing standards
• Improved reporting on curriculum and evaluation
• Improved educational and research survey capabilities

Ⅲ Technology
• Standardization of Educational Technologies across UCSF and within the School of Pharmacy
• Auditable, repeatable compliance with certification and licensing standards
• Improved reporting on curriculum and evaluation
• Wireless available in all classroom and common areas
• Improved SLA compliance, support, uptime, and integrated authentication

8. Solution Description

Technology
The below “best of breed” Open Source and SaaS architectures were selected:
Ⅷ UCSF Registrar provides the student registration systems
Ⅷ UCSF Library provided Confluence Wiki for interdepartmental communication (www.atlassian.com)
Ⅷ UCSF Library provided Collaborative Learning Environment (moodle.org)
Ⅷ UCSF School of Medicine and Library provided Ilios 2.0 curriculum management system (iliosproject.org)
Ⅷ E-Value evaluation (e-value.net)
Ⅷ ETS provided lecture capture (edtech.ucsf.edu)
Ⅷ UCSF Teaching and Learning Center (tlc.ucsf.edu) provides clinical simulation and “best of breed” educational space
Ⅷ Informatics Resource Center (IRC) computer lab upgrade is supported by SOP IT
Ⅷ SOP IT provides distance learning and video conferencing (www.radvision.com)
Ⅷ ITS hosted ServiceNow for support tickets (service-now.com)
Ⅷ ITS provided Guest and Militarized wireless to all learning and common spaces
Ⅷ ITS hosted authentication via Shibboleth (MyAccess)
Ⅷ SOP IT provides the School DataMart using FileMaker Pro
Ⅷ co-governed EdTech strategic plan and committee with SOP and UCSF representation

Collaborative Operating Model
The SOP interdepartmental EdTech Working Group governed by the SOP EdTech Committee (a sub-committee of the SOP Educational Policy Committee) in collaboration with the UCSF EdTech Strategic Planning Committee owns the overall SOP EdTech strategy and support.
The below collaborative Operating model was selected:
Ⅷ UCSF SOP Center of Excellence for Educational Technology and Administration created to liaise with the below teams, advocating for SOP teachers and learners
Ⅷ UCSF Registrar owns the support of student registration and identity details
Ⅷ Library supports the Wiki, CLE, and Ilios platforms and developers
Ⅷ SOM Educational Technology owns Ilios development
- UCSF Educational Technology Services owns the Lecture Capture
- UCSF ITS hosts infrastructure (migrating)
- Qualtrics SaaS Survey Engine integrated with UCSF MyAccess
- SOP IT supports video, audio, and desktop conferencing solutions
- Using shared ServiceNow ticketing, Central IT, Information Technology Services (ITS) provides ticketing support and governance
- CTSI provides Research Publication tracking

The above foundational architecture, interdepartmental, collaborative, Open Source and outsourced SaaS EdTech Services Suite provides high service quality, strong SLA compliance, predictable and known cost. It is in alignment with UCSF and School wide Operations Excellence initiatives.
9. As Built Solution

**UCSF Wiki and Collaborative Learning Environment**

The UCSF Library provides the Open-Source Moodle and Confluence platforms integrated with the UCSF MyAccess authentication and identity platform. This provides School learners and educators learning and administrative portals and is integrated with the Ilios curriculum management system and the ETS Lecture Capture platforms.

**Online Course Page with Curriculum Calendar and Learning Materials/Objectives**

**Online Quizzes**

**Articulate Presenter Lectures**
UCSF Ilios 2.0 Curriculum Management

Leveraging the success of the UCSF School of Medicine, the Ilios application (a Larry L. Sautter Award winning application) is the electronic hub for curriculum planning and oversight at UCSF's School of Pharmacy. While in the midst of dramatic curriculum change, we recognized the need for a powerful tool that would both facilitate communication among course designers and serve as a collaborative development forum.

Ilios is more than a database of curricular details. With its intuitive interface and smooth navigation, it offers faculty, students, and staff a means of tracking course information and generating comprehensive reports about the integration of themes, concepts, and learning objectives.

Ilios is a highly flexible, web-based application that truly supports the innovative and interdisciplinary nature of our curriculum.

- Longitudinal monitoring of the required and elective curriculum in the Essential and Clinical Core
- Customized reports that include a wide-range of search parameters
- Learning materials database that houses multimedia content

Curriculum mapping: linked course and session objectives

![Curriculum Mapping](image)
E-Value, Evaluation and Accreditation Reporting

The E-Value SaaS Platform is used for evaluation of didactic and experiential learning, student portfolio tracking, student duty hours reporting, and learning pathway evaluation, among others. It is also used by the UCSF School of Medicine.

Over 100 pharmacy schools worldwide use E*Value, it is the a comprehensive, user-friendly, well supported pharmacy education management solution and helps the School meet accreditation standards, monitor student skills, learning and requirements, and helps automate administrative processes.

E-Value - Faculty and Student Records
E-Value – Accreditation Performance Reporting

- **Student Performance**: Summarized numerical data showing means, counts, and standard deviations of performance scores.
- **Student Comments**: Comment answers summarized by Activity.
- **Student Scores**: Raw scale scores displayed by question by Activities and Time Frame.
- **Educator Performance**: Summarized numerical data showing means, counts, and standard deviations of performance scores.
- **Educator Comments**: Comment answers summarized by Activities.
- **Educator Scores**: Raw scale scores displayed by question by Activities and Time Frame.
- **Activity Performance**: Summarized numerical data showing means, counts, and standard deviations of performance scores.
- **Activity Comments**: Comment answers summarized by Activities.
- **Activity Scores**: Raw scale scores displayed by question by Activity and Time Frame.
- **Site Performance**: Summarized numerical data showing means, counts, and standard deviations of performance scores.
- **Site Comments**: Comment answers summarized by Activity.
- **Site Scores**: Raw scale scores displayed by question by Activity and Time Frame.
- **Group Performance**: Summarized numerical data showing means, counts, and standard deviations of performance scores.
- **Group Comments**: Comment answers summarized by Activity.
- **Group Comparison**: Allows you to compare an individual’s performance to the overall group.

Click on a sub-menu item to continue.
Lecture Capture, Video Conferencing, and Distance Learning

To support the diverse learning styles of students, ETS provides multi-media, lecture capture and video conferencing capabilities. This provides both students and teachers the ability to access course materials and lectures remotely and at a time that best suits their schedule.

Lecture Capture and Video Conferencing
Qualtrics Research and Educational Survey Suite

The Qualtrics Research Suite, a SaaS solution, allows students, faculty, and staff to build, distribute and analyze online surveys; from the simple to the most complex. Educators can collaborate in real-time, export data in multiple formats (Excel, HTML and more) and integrates with the Salesforce CRM. Features include:

- Access 100+ surveys and question types through the Qualtrics Library
- Choose from UCSF-approved templates, fonts and colors
- Send and track participation invitations
- Embed video, audio and graphics
- Create mobile-friendly surveys
- Utilize online helps and tutorials
- Utilize polls and website feedback tools
- Allow document uploads

Qualtrics Online Surveys

Website Satisfaction Survey

Q1: Overall, how satisfied are you with your experience on the Qualtrics University?

Very Dissatisfied: 0, 1, 2, 3, 4
Neutral: 5, 6, 7, 8, 9
Very Satisfied: 10

Q2: What was your purpose for coming to our Online University today?

Q6: What percent of your time was spent watching the videos?

% of Time: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

60
**IRC, Teaching and Learning, and Wireless Access Upgrades**

The newly upgraded UCSF School of Pharmacy Informatics Resource Center (IRC) and the UCSF Teaching and Learning Center provide “best in class” access to medical education, journals, and simulation environments. They also provide secure wireless access to UCSF journals and systems, as well as a great social “Tech Commons” for students to collaborate.

**Teaching and Learning Center and Informatics Resource**

**Teaching and Learning Center**

*Advancing interprofessional health education*

Integrated teaching and learning— all under one roof.

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**KANBAR CENTER**

Teach and learn in simulated clinical settings—exam rooms, inpatient unit, OR, emergency and ICU. Capture video or transmit live for telehealth training.

**TECH COMMONS**

Learner-centered computing space for group and individualized work. Computer classroom, presentation practice room, and editing suite.

**CLASSROOMS**

7 large seminar rooms and 9 classrooms equipped for telemedicine training. Flexible furniture and other technologies support interprofessional learning.
School of Pharmacy Educational Technology Data Mart

To integrate data from all the above systems, back-end data access is provided to the UCSF School of Pharmacy Data Mart system. This provides EdTech wide ad-hoc reporting and key performance indicators to School leadership.

Executive Reporting

<table>
<thead>
<tr>
<th>Subject</th>
<th>Rank</th>
<th>Core Courses where lectures 2 hours or less</th>
<th>Core Courses where lectures 3 hours or more</th>
<th>Pathway Courses where lectures 2 hours or less</th>
<th>Pathway Courses where lectures 3 hours or more</th>
<th>Elective Courses where lectures 2 hours or less</th>
<th>Elective Courses where lectures 3 hours or more</th>
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<tbody>
<tr>
<td>273 Yang, Kathy</td>
<td>Faculty - SOP</td>
<td>CP 111, CP 135A, CP 113</td>
<td>CP 163.10A</td>
<td>CP 158</td>
<td></td>
<td></td>
<td></td>
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<td>274 Yokoyama, Glenn</td>
<td>Faculty - SOP</td>
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<td>275 Youmans, Sharon</td>
<td>Faculty - SOP</td>
<td>BioChem 112</td>
<td>CP 111</td>
<td>CP 137</td>
<td></td>
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<tr>
<td>276 Young, Rebecca</td>
<td>Adjunct Faculty</td>
<td>CP 112</td>
<td>CP 111</td>
<td>CP 137</td>
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<tr>
<td>277 Yu, Jane</td>
<td>Faculty-non-SOP</td>
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<td>278 Yuan, Betsy</td>
<td>Faculty - SOP</td>
<td>CP 130</td>
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<td>279 Yuan, Courtney</td>
<td>Adjunct Faculty</td>
<td>CP 121</td>
<td>CP 113</td>
<td>CP 170.08</td>
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<tr>
<td>280 Ziv, Elad</td>
<td>Faculty-non-SOP</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Authentication and Ticketing

Often overlooked, but critical to successful operations support the MyAccess and Service Now Platforms provide authentication and ticket tracking for students, faculty and staff.

MyAccess Authentication and IT Services Portal

Service Now IT and Administrative Ticketing System
10. Customer Satisfaction Data

We have yet not done School wide, formal assessment of the EdTech Services Suite to date. With that said, Students who worked on the project, under the leadership of Dr. Tina Brock, assessed the Ilios aspects of the project which they worked directly on, below are their results.

Background

The UCSF School of Pharmacy aims to adapt its curriculum dynamically to address current and future needs within the field. In part through its transition to Ilios, an electronic curriculum management program, which was developed and is used by the UCSF School of Medicine. The Ilios system is linked to the University’s curricular delivery system, the Collaborative Learning Environment (CLE) for student access.

A previously published report has described the initial development of this system, including the overall goals of the project. This report focuses on initial assessment of the student curriculum liaisons about the barriers encountered with this transition as well as feedback from faculty course directors, using the program for Fall 2011 and winter 2012 terms.

Methods

- Student curriculum liaisons and central staff who had supported the transition of the courses into Ilios categorized their assessment of course directors response to the new system. Their overall impressions were categorized as 1-resistant, 2-somewhat resistant but accepting; 3-neutral; 4-accepting of the new technologies despite some barriers, and 5-advocate for using the new system.
- All course directors, support staff and PhD (PharmD) student teaching assistants (TAs) for fall and winter terms (N = 43) were surveyed via a six item web-based instrument regarding their experiences, specifically, perceived benefits, barriers and their overall attitudes.

Results

Curriculum Liaison Reflections:
- The average impression of the transition process and of the Ilios system was 3.2 (neutral to accepting).
- The main barriers identified (in order of significance) were: program/technical problems, maintenance issues, and time commitment.
- Other barriers encountered were: resistance to change from the established system and course-specific logistical issues.

Course Director, Support Staff and TA Feedback:
- The response rate to the survey was 63%, including 20/30 course directors, 6/10 support staff and 2/4 TAs.
- Seventy percent of respondents first used the Ilios system in fall term; 30% first used it in winter term.
- Respondents self-categorized their overall responses to the new system as: resistant (14%), somewhat resistant but willing to participate (7%), neutral (13%), accepting despite some barriers (43%), advocate (25%).

Note that because the implementation has included the gradual roll-out of some features, winter course directors were more likely to recognize benefits to the system.

Perceived Barriers to the Ilios/CLE System:

Conclusions

- Attitudes towards transitioning the curriculum into the Ilios system were mixed; however, the majority were accepting of the process as self-reported and assayed by the implementation team.
- Features associated with the organization of and access to concepts and learning materials across course were most appreciated by course directors, support staff, and TAs.
- Barriers associated with the user interface and the time commitment required were perceived as most problematic.
- Pending program updates to the user interface and the use one-click cloning for next year will address some of the key concerns.
- Adding feedback from learners regarding this process will provide a more complete picture of overall usefulness.

Note that because the technology was evolving over the course of the implementation, fall course directors were more likely to perceive barriers.

1. For more information about Ilios, please see: http://www.iliosproject.org/
Students also evaluated e-value.net, a required part of our curriculum. Not many enjoy doing evaluations, so the primary feedback they chose to give was regarding the best time to do them. With that said, adoption of the tool was successful and not a primary focus of concern.

## Teaching Evaluation Scheduling Survey

### 1. Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>45.7%</td>
<td>55</td>
</tr>
<tr>
<td>P2</td>
<td>21.7%</td>
<td>28</td>
</tr>
<tr>
<td>P4</td>
<td>32.6%</td>
<td>42</td>
</tr>
</tbody>
</table>

- answered question: 129
- skipped question: 0

### 2. Rank your preference of when evaluations will be available. Select 1-5, where 1 is your top choice and 5 is least choice.

<table>
<thead>
<tr>
<th>Evaluation Type</th>
<th>1st Choice</th>
<th>2nd Choice</th>
<th>3rd Choice</th>
<th>4th Choice</th>
<th>5th Choice</th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Evaluations</td>
<td>5.8% (6)</td>
<td>6.8% (7)</td>
<td>4.9% (5)</td>
<td>18.4% (19)</td>
<td>64.1% (66)</td>
<td>4.28</td>
<td>103</td>
</tr>
<tr>
<td>Weekly Evaluations</td>
<td>28.2% (29)</td>
<td>12.6% (13)</td>
<td>22.3% (23)</td>
<td><strong>35.9%</strong> (37)</td>
<td>1.0% (1)</td>
<td>2.69</td>
<td>103</td>
</tr>
<tr>
<td>Biweekly Evaluations</td>
<td>22.1% (23)</td>
<td>33.7% (35)</td>
<td>38.4% (41)</td>
<td>4.8% (5)</td>
<td>0.0% (0)</td>
<td>2.27</td>
<td>104</td>
</tr>
<tr>
<td>Monthly Evaluations</td>
<td>25.7% (27)</td>
<td><strong>35.2%</strong> (37)</td>
<td>21.0% (22)</td>
<td>16.2% (17)</td>
<td>1.9% (2)</td>
<td>2.33</td>
<td>105</td>
</tr>
<tr>
<td>No Change in Procedure</td>
<td>25.0% (27)</td>
<td>12.0% (13)</td>
<td>11.1% (12)</td>
<td>23.1% (25)</td>
<td><strong>28.7%</strong> (31)</td>
<td>3.19</td>
<td>108</td>
</tr>
</tbody>
</table>

- answered question: 113
- skipped question: 16
11. The timeframe of implementation

The UCSF wide, collaborative, assessment phase commenced Summer, 2010. Development and deployment of the technologies to support the SOP Educational Technologies commenced Winter, 2010 and completed Spring Quarter, 2012. Because a collaborative, interdepartmental, SaaS model was chosen, foundational technologies were provisioned almost immediately. The bulk of the technical implementation and configuration to the School’s specific EdTech requirements, were completed as of Spring 2012, with ongoing, iterative improvements ongoing.

SOP integration of the following technologies competed for all PharmD program associated activities approximately on the following dates.

<table>
<thead>
<tr>
<th>Web application</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrar Systems</td>
<td>Already in place</td>
</tr>
<tr>
<td>Cle.ucsf.edu (Moodle)</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>Curriculum.ucsf.edu (Ilios)</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>e-value.net</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>Lecture Capture</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>IRC (computer lab) upgrade</td>
<td>Fall Quarter 2011</td>
</tr>
<tr>
<td>Service Now Ticketing</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>Wiki.ucsf.edu</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>Qualtrics online surveys</td>
<td>Spring Quarter 2012</td>
</tr>
<tr>
<td>MyAccess Single Sign-On</td>
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</tr>
<tr>
<td>SOP DataMart</td>
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