**UCSF Business Intelligence & Data Analytics – Dashboard / Analytics Tool**

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**Names of project leader and team members**
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**Background**
As organizations implement Epic and other technologies, they become data rich but remain immature data consumers. Recognizing this, UCSF has been hard at work harvesting this rich data and providing useful analysis to leaders, impacting hospital operations, clinical care and research. This project defines our approach and use of innovative technology to leverage data from multiple systems and create an aggregate view of our operational health and positively impact patient outcomes. This project established strategies to successfully build analytical dashboards using Qlikview, to increase organizational insight and impact business and clinical outcomes.

UCSF’s journey began two years ago with an Enterprise Data Warehouse project and an attempt at analytics and dashboards creation. Stakeholders asked a small tactical team to identify priorities to develop three dashboards. However, each subsequent dashboard would incur new project charges. After seeking the advice of experienced consultants, we agreed that we needed a business intelligence tool that would advance self-service analytics. We chose Qlikview as our analytics platform. The fall 2013 announcement of Qlikview’s official partnership with EPIC, our EHR vendor, solidified it as the right choice.

**Project and significance**
A virtual team was developed consisting of a Project Manager, analysts, technical build experts and subject matter experts from Finance and the Electronic Health Record (EHR) team for the duration of this project. The team was chartered to develop the first proof of concept, self-service dashboard for UCSF using the new tool. In addition, they were to create a repeatable process for dashboard development from intake through assessment to implementation. Responsibilities included creation of dashboards from this core team, while also developing processes for a “franchise” development model to prevent a bottleneck of requests.

User acceptance of these analytical tools as well as our approach has been the catalyst for the organization to dedicate time and resources in developing further analytic tools. Disseminating the process and results helped the organization understand the roadmap and discipline needed to achieve similar goals. Our model is agnostic to individual departments and could be applicable and valuable to all areas from senior leadership to direct care clinicians.

**Scope**
- Executive Dashboard – FlashDash: an executive dashboard to provide daily access to key data regarding hospital census, surgical volumes, ambulatory volumes, and patient care revenue. This dashboard is owned by the CFO with the key audience identified as Medical Center Executives, Directors, Managers, Medical Directors and Service Chiefs.
- Discharge Before Noon Dashboard – Dischdash: an operational dashboard to provide daily access to unit, service and attending provider level information on discharge orders and times. This was designed to help communicate performance against our organizational goal of 20% discharges before noon. This dashboard is owned by the Discharge before noon workgroup, headed by Dr. Adrienne Green, with open access to anyone on the UCSF network.
- Quality Dashboard – QualDash: an operational dashboard to serve as a one-stop shop for key patient safety, quality and patient satisfaction information. Transparent performance on metrics can be viewed from both the unit and service level. This dashboard is owned by the Executive Director of Patient Safety and Quality with the key audience identified as Medical Center Executives, Directors, Nursing Leadership, Medical Directors, Service Chiefs and Quality Improvement champions.
- Research Data Browser – RDB: (In limited-access pilot phase) allows research-users broad access to de-identified patient- and encounter-clinical data. This data browsing tool sits on top of data stored in our new enterprise data warehouse. It follows a self-service model to investigate de-identified patient health information from the EHR. It facilitates researchers to identify cohorts of patients and investigate encounter-level information that may impact research. It is owned by the UCSF Academic Research Systems department.

**Implementation Timeframe**
The initial dashboard, FlashDash, was created in 60 business days in a three-cycle iterative build process including requirements gathering, setting up IT infrastructure, security and provisioning, and storyboarding. With all that we learned from this, we were able to implement the narrowly focused DischDash in less than 30 days. These timelines are unprecedented at UCSF for analytics projects to complete and were the key to the buy-in of and success for key stakeholders and end users.
**Project Details and Impact**

Each dashboard created during the project supported more than one of UCSF’s missions from research, health care, business/finance/administration, and technology infrastructure.

**Executive dashboard or FlashDash**

This dashboard provided key business / finance information for the Chief Financial Officer to have a daily pulse of the organizations performance against budget / targets. Timely information allowed for more proactive and less reactive interventions as needed. Historical data analysis of patient and surgical volumes provided tremendous knowledge during the planning sessions of a second union strike.

**Impact**

Use of this dashboard by administration was extremely helpful and provided key data to plan accordingly. The hospital staffing plans based on patient census and surgical volume were created as a result to ensure safe patient care persisted despite a strike.

**Flashdash – home page**

This project spawned an enhancement – a filter for a patient research flag to allow comparisons of research- and non-research-patient volumes, revenue and other dashboard data. This comparison helps us understand the revenue impact of this population, informing strategic planning and budgeting decisions. This had previously been unreported in any meaningful way; this enhancement emphasizes the innovation of our approach.

**Discharge Before Noon Dashboard or DischDash**

This dashboard provides staff and clinicians the ability to analyze discharge information stratified by service, unit and providers. It is open to anyone within the UCSF network. It enables trend analysis of the percentage of patients discharged before noon by teams across the organization, identifying metrics in related areas where opportunities for improvement exist.
Impact
Within a month of implementation we observed a greater than 20% increase in discharges before noon, accomplishing a central organizational goal. This increase allows more patients to receive access to critical inpatient clinical care we provide.

Discharge Before Noon Dashboard – By Unit

Within a unit, the individual providers’ performance

Quality Dashboard or QualDash
This Quality analytic tool aggregates and compares key quality indicators for ease of analysis by administrative leadership, physicians, clinical and operational professionals. Qualdash provides self-service access to all national and state mandated quality indicators and patient satisfaction scores as well, making it a one-stop shop.

Impact
The Quality dashboard has streamlined some 19 individual reports and reduced monthly report prep time by over 16 hours a month. More importantly, it provides a single source for leaders to access Quality information when and where they want it.
Research Data Browser - RDB

To support UCSF’s research mission, a project to develop a research data browser (RDB) piloted and enabled a self-service front end for researchers to search Epic clinical data. This tool not only leveraged the analytical tool used for other dashboards, but also thoroughly tested the EHR’s enterprise data warehouse, Cogito. The RDB leveraged the analytical tool to provide de-identified data, eliminating the need for approval prior to granting researcher access.

Impact

Creation of a de-identified research data browser overlaid on top of the EHR allows researchers to search for cohorts of patients to guide development of research protocols, potential impact of research, etc. De-identification of the clinical data permits access without specific project approvals. The self-service functionality alleviated resources used to build reports, allowing more focus on analytics and less focus on data access. Creating easy access to information that was previously difficult to reach has significantly enhances researcher’s abilities to explore clinical records advancing research.
Research Data Browser- sample selections and cohort result

Sample Demographics browser tab

Relevant URLs
While access to dashboards require UCSF network or VPN access, the links are
- Executive Dashboard – FlashDash: http://flashdash.ucsfmedicalcenter.org/
- Quality Dashboard – QualDash: http://qualdash.ucsfmedicalcenter.org/

Objective customer satisfaction data
Usage statistics:

<table>
<thead>
<tr>
<th>Dashboard</th>
<th>Number of Users since live</th>
<th>Number of sessions since live</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Dashboard – FlashDash</td>
<td>231</td>
<td>885</td>
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<tr>
<td>Discharge Before Noon Dashboard – Dischdash</td>
<td>348</td>
<td>923</td>
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<tr>
<td>Quality Dashboard</td>
<td>345</td>
<td>1,119</td>
</tr>
<tr>
<td>Research Data Browser – RDB (pilot)</td>
<td>56</td>
<td>267</td>
</tr>
</tbody>
</table>

In addition, since implementation of the project, there has been great enthusiasm for this tool as there has been 32 formally documented requests for additional analytical products.