



METRIC INSIGHTS

CASE STUDY

Evolution of Business Intelligence at UCI



UC Irvine Health

Push Intelligence

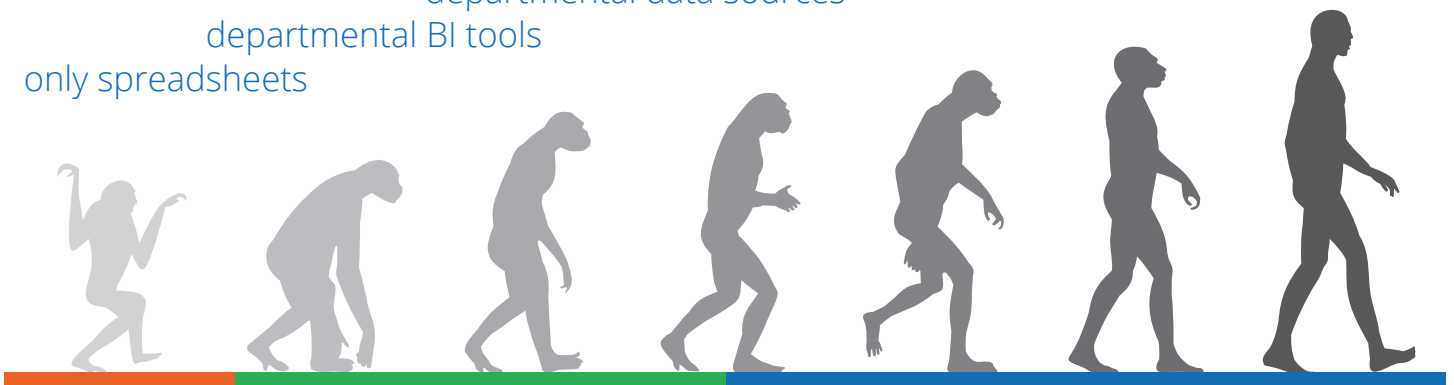
lots of dashboards

unstructured data

departmental data sources

departmental BI tools

only spreadsheets



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Organization

UC Irvine Health comprises the clinical, medical education and research enterprises of the University of California, Irvine. Patients can access UC Irvine Health at physician offices throughout Orange County and at its main campus, UC Irvine Medical Center in Orange County, California. UC Irvine Medical Center is a 411-bed acute care hospital providing tertiary and quaternary care, ambulatory and specialty medical clinics, behavioral health and rehabilitation. It is the primary teaching location for UC Irvine School of Medicine.

UC Irvine Health Stats

- Population Served: 3M
- Employees: 4,400
- FY2012 ER visits: 437,000
- FY2012 Surgeries: 11,916
- Bed Count: 411



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- Informatics Solutions Architect
- 20 years healthcare IT experience
- VP, American Nursing Informatics Association
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- 2010 Tableau User Conference Presenter

Abstract

UC Irvine Health Services has become a data-driven healthcare organization through a number of evolutionary steps over the past decade. This case study analyses the different steps they've taken to become a leading data-driven organization driven by the best of healthcare analytics.

At a glance

Challenges

- Implementation of different BI tools and data sources over the years resulted in a powerful analytics capability but a reporting challenge.
- Too many dashboards in the organization for users to consume.
- Analytics team overwhelmed with too many requests for reporting.
- Users had no way to know when critical data changes.
- Too many emails and attachments going around discussing data.

What they wanted to do

- Bring together in one framework all their business intelligence tools (Tableau, Excel) and their data sources (Hortonworks Hadoop, MongoDB, Microsoft SQL server)
- Provide a personalized view into the data to all their executives and administrators.
- Push daily emails and alerts to users telling them when critical changes happen in data that is relevant to them, and why.

What they did

- Implemented Metric Insights with connectors to existing BI tools (Tableau) and data sources (Hadoop, Mongo, MS SQL Server).
- Provided a personalized view to executives and administrators of only the data they care about.
- Provide daily digest emails and alerts to enable users to know when their data changed critically, and why.



Case Study

UC Irvine Health Services has become a data-driven healthcare organization through a number of evolutionary steps over the past decade. This case study analyses the different steps they took and how they've become a leading data-driven organization driven by the best of healthcare analytics.

UC Irvine has implemented a number of technologies to provide leading edge analysis of its healthcare data.

Data tools

UC Irvine implemented different database technologies based on needs for different systems at different times. Each database solves the problem it is designed for.

Application-level data sources

Each application (Allscripts, etc.) has its own database and reporting functions integrated with the vendors product.

- *MS-SQL Server*

MS-SQL Servers were implemented to combine many of the EMR data sources into once accessible server to allow more regular reporting and real-time data access. However, a portion of the EMR data is calculated and stored in the MongoDB.

- *Hortonworks Hadoop*

Hortonworks Hadoop was implemented as a centralized data warehouse to store all UC Irvine Health's data.

- *MongoDB*

MongoDB was implemented to do real-time and predictive analytics. UCI determined that Hadoop was a great place to store the data, but that MongoDB with a smaller footprint was more efficient at doing the predictive analytics work. UCI pulls data from HDFS via MapReduce into MongoDB for this function.

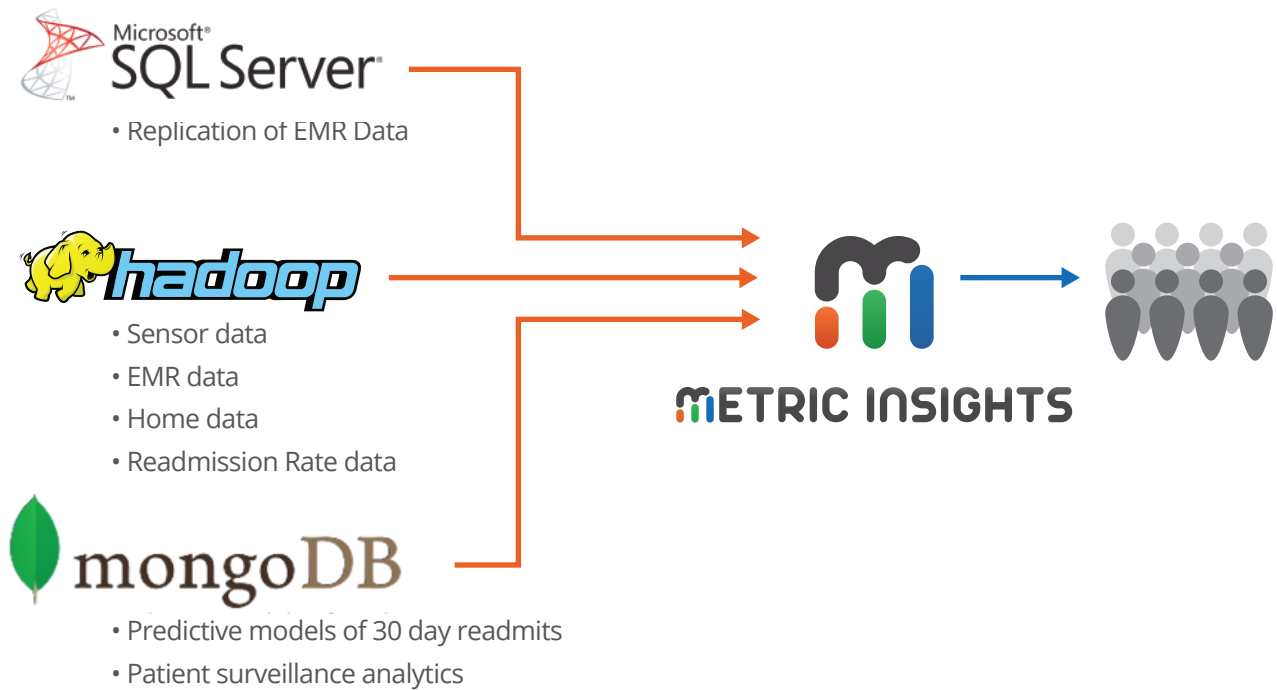
Challenge

Each data source is well optimized for its specific function. However, with multiple data silos, it became difficult to do cross system reporting, detect critical changes in real time, and understand how changes in one data source might be correlated or affected by another.

Solution

UCI implemented Metric Insights Push Intelligence Platform. Key Performance Indicators from each data source were pulled into Metric Insights. Users could subscribe to the key metrics they cared about and be alerted when those metrics changed in a way that required attention.





Business Intelligence Tools

UCI implemented different database technologies based on needs for different systems at different times. Each database solves the problem it is designed for.

- *Excel*
 UCI originally relied on excel reporting. The analytics team would spend a significant amount of their time formatting excel and producing reports. This was a labor intensive process.
- *Tableau Desktop + Excel*
 UCI purchase a number of Tableau desktop licenses. This greatly enhanced their ability to do data discovery and ad hoc analysis.
- *Tableau Server + native data connectors to MS SQL and Hadoop*
 As the next evolutionary step, UCI connected Tableau natively to their MS SQL and Hadoop data sources. The company was able to do enhanced reporting and data discover directly from the native data sources in their organization.

As a result, as of 2013, Tableau is widely used across the organization. In aggregate, there are:

- Over 60 analysts using Tableau Desktop
- Over 4400 employees with Tableau Server access
- Dashboards with the following areas of focus:
 - Quality Dashboards
 - Performance Dashboards
 - Departmental Dashboards

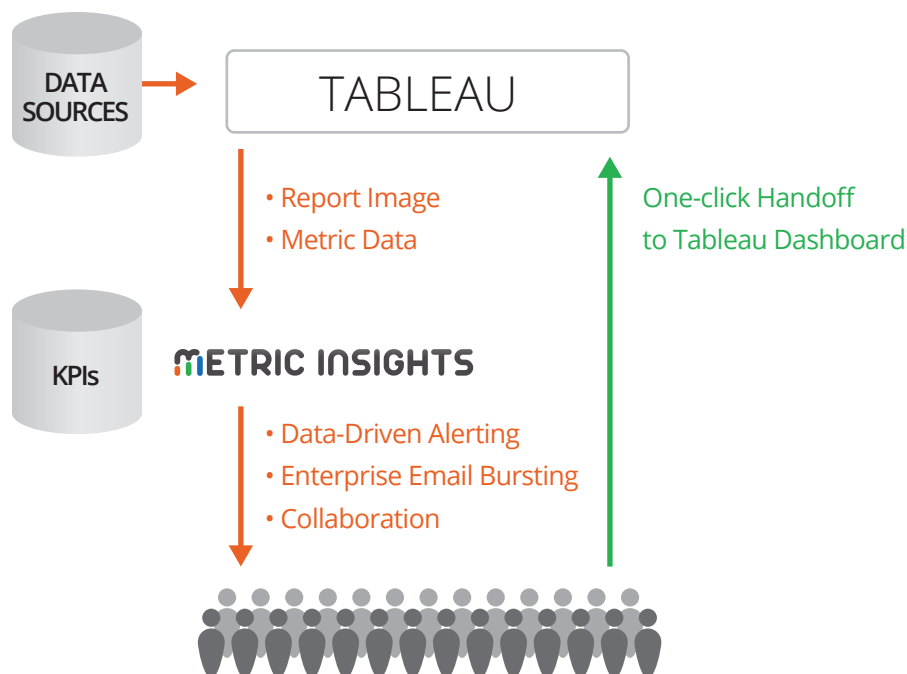


Challenge

Over time, the UCI analytics team developed several hundred dashboards for the organization. Users didn't always know where to find the dashboard with the relevant data. Furthermore, there was no proactive way for a user to know when data had changed critically on a dashboard, and it would require their attention. UCI needed a solution that would let users know when the data they cared about changed critically.

Solution

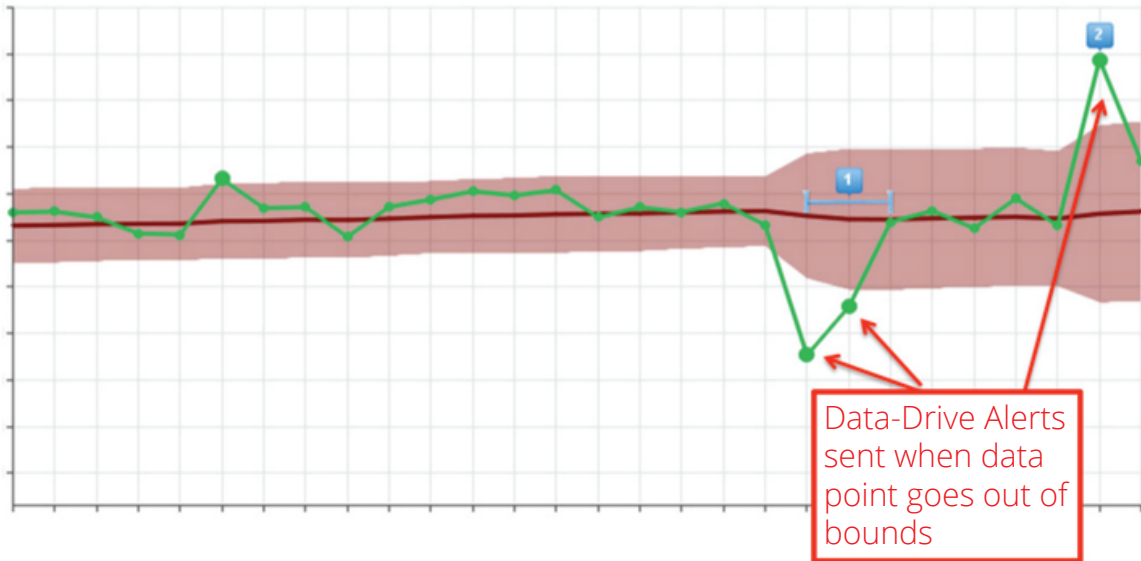
UCI implemented Metric Insights' Push Intelligence for Tableau solution. Metric Insights provides data-driven alerting, e-mail bursting, and a powerful collaboration platform for Tableau. Tableau usage is increased through push notifications that bring users into the relevant Tableau dashboard when there is critical change in the data.



Push Intelligence for Tableau extends this core functionality in ways that proactively alert users to key changes that are occurring within their Tableau environment.

For example, Users can receive alerts and notifications when there is a statistically significant change in data or when a metric passes a certain threshold. The following image shows an example of receiving alerts when the data has changed more than two standard deviations from the moving average. Metric Insights tracks data change against multiple criteria including spotlight thresholds, moving targets and more.





The following Pulmonary Dashboard illustrates the power of Tableau Software combined with Metric Insights. The dashboard has many filters allowing users to do deep ad-hoc, data discovery.

Example: Tableau Dashboard with many metrics and dropdowns

Dropdown1

Dropdown2

Alerts from metrics in underlying dropdowns

Metric-Level Alerting

Metric Insights enables users to be notified when an individual metric has changed in a way that requires attention. The metric can be sourced from any part of a workbook, including from metrics in underlying dropdown and pick-list selections. A single workbook might have dozens of metrics. Different users could be alerted by different metrics in the same workbook based on role or what they have subscribed to. For example, for a readmission rate dashboard that has a drop-down option for each hospital ward, each ward manager could be alerted for significant changes in readmission rates in their own ward.

Conclusion

UCI Health Services has become a data-driven healthcare organization through a number of evolutionary steps over the past decade. UCI chose different best-of-breed business intelligence tools and data sources for specific problems in the organization. UCI then used Metric Insights to provide a layer bringing all those data sources and applications into a single framework that makes it easy for users to receive data that is critical to their job function..

About Metric Insights

Metric Insights lets your users cut through the noise, focus immediately on the critical business issues that warrant their attention, and take action. Our Push Intelligence platform connects quickly and easily to your existing business intelligence tools, big data and SaaS applications. Metric Insights uniquely delivers a patented KPI warehouse, collaboration and notification technologies that tell you when your key business metrics have changed, and, more importantly, why.

