Title: Management and Performance Hub

Category: Improving State Operations

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Project Dates: August 2013 – January 2015

Executive Summary: The Management Performance Hub (MPH) is an advanced data analytics (big data) management system for the State of Indiana government. Based on SAP tools and Socrata, it performs business analytics and in-depth case studies on specific problems. While the aforementioned functions are used toward policy development, MPH also houses a public transparency site enabling citizens to access a variety of real-time information about state government.

The MPH initiative began with the kick-off of an infant mortality study in August 2013 and was followed with an executive order by Governor Mike Pence in March 2014 implementing a data-sharing culture. The MPH website was launched in June 2014. And a physical MPH center opened in September 2014.

With the stated goal of embracing a data-driven decision-making style of leadership, Governor Pence wants Indiana be the most effective, efficient and transparent state government in the nation.

Business Problem and Solution Description: With such a transformative entity as the MPH, developers have aimed to tackle a very wide array of challenges – all through vastly improved collection of data and analysis of the data once collected. There were two major goals of the project, along with two minor objectives.

1. **Turn Indiana into a data-driven decision making entity:** Government decisions should not be made on hunches or assumptions. MPH collects and analyzes data to help leaders make better decisions.

   Each of the more than90 executive-branch agencies is graded against key performance indicators. These were previously calculated by each agency on a monthly basis and in many cases required hand calculation. After MPH was implemented, these became automated computations shown in real time for all cabinet-level agencies.

   The Governor and agency heads can now view the metrics as they happen, allowing for quicker decision-making and course correction.

2. **Infant Mortality study:** Indiana historically has fallen in the bottom 20 percent of states in infant survival rate. To take a new approach to this problem, the MPH was commissioned to pull in data to examine what factors were causing the state's infant mortality rate to remain higher than the national average. In 2011, Indiana's infant mortality rate was 7.7 deaths per 1,000 live births.

   The State utilized sophisticated techniques on available data to identify highly granular at-risk subpopulations and provide actionable insights.

   The analysis found that inadequate prenatal care, Medicaid enrollment and young maternal age were the strongest predictors for adverse birth outcomes.

   It also discovered this startling fact: While the identified high-risk subpopulations account for only 1.6 percent of all Indiana births, they account for nearly 50 percent of infant deaths.

To meet the ambitious goals of Gov. Pence, agencies were required to break down traditional silos and share data for the project. State employees within the Office of Management and Budget (OMB) and the Office of Technology were tasked with managing the project and developing a communication plan targeted to state employees to transform the state's data sharing culture.

To overcome some initial resistance, new security measures were put in place for the infant mortality project because of the sensitivity of the data. All data sets are placed behind multiple firewalls in a protected data row. Analysts who work directly with the privacy data have all undergone background checks, and they work in a secure room. The computers in the secure room do not have access to the Internet, and analysts are unable to bring in cell phones or personal equipment.

There are strict agreements in place on how the data can be used in the form of MOUs.

3. **Transparency site:** When the project began, Indiana had already been named the most transparent state by US PIRG. Despite that, the goal was to provide all of the information that encompass agency KPIs to the public. A new site was created that focused on being more user-friendly and visually pleasing. Gov. Pence's Roadmap goals are detailed and visitors can view the statistics and data behind the Roadmap. Users can search by agency performance or find all of the raw data, which includes over 1,700 data sets, to make their own charts and graphs. The raw data sets can be combined by the end-user through the open-data platform.

4. **Physical space:** To assist with the cultural data-driven management style, a physical space was renovated below the Governor's office. Based upon Silicon Valley offices, the MPH room is an open-seating area, with large touchscreen displays to share information. The room is used by budget analysts to crunch all of the new data and to make presentations. It was not only a symbol of the shift in philosophy but also a practical update to a government space.

Significance: The MPH has had a profound impact on the way Indiana has operated. The change to fully embrace a data-driven decision-making management style -- a goal directed from Gov. Pence -- has resulted in many positive changes that would not have been possible prior to data being shared among agencies.

OMB analysts, with the additional data and technology improvements, have been able to create dashboards weeks quicker than previously possible. This has allowed quicker decision-making by agency heads and the General Assembly.

Some of the dashboards were used to show lawmakers directly how targeted changes in funding could have significant impact in alleviating infant mortality and combating drug abuse.

Key stakeholders include the governor, agency heads, lawmakers and the public.

Benefits of the Project: The benefits of the MPH are too broadly distributed to be pinned to any readily identifiable or narrowly defined population. Certainly, citizens and policymakers alike benefit from the ready access to real-time data. On any given project undertaken through data analysis as part of MPH, a different set of individuals could stand to benefit – the families of expectant mothers and all others for whom infant survival is a priority, for example, in the case of the infant mortality project.

Turn Indiana into a data-driven decision making entity: With the combination of new technologies, Indiana has improved its ability to make decisions on the fly, with up-to-date information, instead of stale data. The first measure of the technology is felt on Indiana's transparency site. The implementation of new technologies has allowed some standard queries, which used to take 10 minutes, to be completed in less than one second.

A Budget App was developed for the legislative session that concluded on April 29. The app automatically is populated with the most recent version of the proposed state budget, as written by the legislature, and compares it against the version submitted by the Governor. This allows analysts to quickly compare numbers and programs without having to rely on hand-generated spreadsheets. Budget analysts are able to make "what if" modifications on the fly and see how any change impacts the rest of the budget.

Another efficiency that was achieved is the automatic calculation of agency KPIs. Agencies used to report these to the Governor on a monthly basis, but the automation process allows agency heads and the Governor to see real-time performance updates. These KPIs are pushed out to the state's transparency website (www.in.gov/mph) so the public can monitor the performance of state government.

This is just one example of the processing of data being sped up. A huge benefit is that analysts are no longer spending their time putting data together to run the job. Now that data is in one location and can be pulled quickly, a program analyst can spend time examining the data. As of now, 50 percent more data is being analyzed by government employees than before MPH was instituted.

Returns are immense due to the fact that tasks that once required huge time commitments now can be accomplished in a small fraction of what they once required.

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Query Speed (1000x faster than alternatives)

- Simple query in **SQL: 47s vs. HANA: 0.045s**
- Complex query in **SQL: 643s vs. HANA: 0.125s**

Storage Compression

- Store huge volumes more efficiently: **90+% compression**

Infant Mortality study: Real-world results will be seen in the infant mortality study. Indiana, in the just completed budget, has funded specific programs to target various demographic groups. The study concluded that 15 prenatal visits and a baby weight above 2500 grams are ideal. There are now measurements to help mothers on Medicaid, who statistically make-up 50 percent of the infant mortality rate, and ensure more positive outcomes.

The state's analysis found:

- Infant mortality risk in Indiana is not randomly distributed but exhibits statistically significant patterns.
- Inadequate prenatal care, Medicaid enrollment and young maternal age were shown to be the strongest predictors for adverse birth outcomes.
- While the identified high-risk subpopulations account for only 1.6 percent of all Indiana births, they account for nearly 50 percent of infant deaths.

The results of the study led directly to an additional $13.5 million in legislatively-funded programs that will target the identified sub-populations. Programs will no longer be delivered on a one-size-fits-all approach. The specific tailoring of programs to populations, which previously were unknown, will vastly improve the service level of the State Department of Health outreach.

With new programs put into place, it is expected that there will be a reduction in the number of babies with mothers participating in Medicaid born underweight.

Additionally, an ancillary benefit not considered at the beginning of the project is a saving to taxpayers. Babies born under 2500 grams cost two to three times more in medical care than babies born over that weight. These programs will result in direct taxpayer savings by producing more healthy deliveries.