



# NASCIO 2017 State IT Recognition Award Nomination

**Title:** Department of Human Services (DHS) Interactive – Enabling meaningful program insights

**Category:** Open Government and Data, Information and Knowledge Management

**State:** Pennsylvania

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## Executive Summary

The Pennsylvania Department of Human Services (DHS) has taken innovative steps in its approach to data analysis over the past year. Like most health and human services organizations across the nation, DHS maintains a large number of legacy applications and manual data collection processes to support the programs it provides to Pennsylvania's citizens. The broad nature of this landscape and processes presents challenges in consolidating and analyzing the data required to provide deep insights into performance across the many diverse programs supported. In addition, business users require the ability to explore the data available to them in an efficient and effective manner. To address its evolving business intelligence needs, DHS made a strategic decision to tackle the following limitations of its legacy environment:

- Siloed and disparate data sources and repositories
- Unstructured and semi-structured data which is difficult to analyze
- Delayed, long, and extended solution implementation times
- Difficulties imposed in drilling down into drivers of program performance
- Inability to perform data analysis without IT assistance

In sum, in order to quickly and efficiently promote insight driven decision making across DHS' programs, a need existed for an agile and integrated analytics solution that would position users across DHS to make informed, data-driven decisions, both now and in the future.

In order to enhance analytics capabilities, gain better insights into performance drivers, and improve transparency in reporting, DHS developed a series of advanced performance dashboards that are collectively called DHS Interactive. DHS Interactive is a business user focused tool that includes hundreds of key performance indicators (KPIs) and business metrics, logically organized into 19 executive dashboards spanning 10 different program offices. The dashboards are aligned with DHS' business objectives and provide the necessary information to make important business and policy decisions that impact nearly every program within DHS, including child care, child welfare, Medicaid, TANF, SNAP, substance use disorder, long-term care, program integrity, and CHIP. In addition, the cloud-based information management platform, DHS Interactive, provides DHS business and technical users with access to advanced data visualization tools, enabling exploration of their own data sets. The tool represents an innovative step forward for state HHS organizations by providing data visualization capabilities and a self-service reporting environment to business users in a cost effective, efficient, and scalable manner.

By integrating data across the entire DHS organization and breaking down data and decision-making silos, DHS Interactive delivers executive level analytics to senior DHS leadership across nearly every program office. In addition, the DHS Interactive tool is innovative in the way that it leverages cloud-based technologies, delivering a combination of analytics driven insights and self-service reporting capabilities. As a result, DHS Interactive provides users with the ability to quickly and intuitively monitor and compare performance across multiple agency programs. Delivering direct insights in ways few states have yet accomplished, Pennsylvania equipped users with a tool that provides insights needed to make strategic decisions and assess new and existing policies in relation to DHS's strategic priorities.

## Concept

### Challenge

The Department of Human Services places an emphasis on monitoring performance and outcomes by tracking results in a data-driven manner. In the past, representatives from DHS' program offices, PeopleStat (the department's reporting group), and the DHS secretary met on regular basis to review the operations of DHS' program offices by reviewing static reports centered on DHS' strategic priorities. During these reviews, the analysis was often constrained by the static nature of the reports and the inability to "drill down" in to second and third level questions, providing limited insight into what was truly driving performance trends. In addition,

generating the static reports required significant, sometimes manual effort to pull data from over 50 different data sources, including integrated eligibility and case management systems that supported each program, along with standalone data repositories and databases. Over time, DHS realized a significant need for clean, interactive, and meaningful data visualizations to enable the program offices to gain better insights into their performance and outcomes. As a result, DHS made an investment to improve its reporting capabilities by leveraging data analytics and advanced visualizations to further improve the ability to track progress toward meeting their strategic priorities.

In addition to identifying the need for better insights into their performance based on the data available, DHS also identified the desire to provide data analytics tools to its business users in order to help answer mission-focused business questions. Business users across DHS have a deep understanding of their respective programs and the data available for analysis. DHS realized the power of enabling these individuals with the ability to explore their data to identify trends and insights in ways that were previously not possible. DHS required the flexibility to provide users with access to new data visualization and exploration capabilities without making additional and significant investments in new technologies. Finally, DHS desired an end state where its Bureau of Information Systems (BIS) team would have the capability to take ownership of the data visualization toolset. To affect this, the BIS team worked "side by side" on development activities and participated in weekly knowledge transfer sessions with DHS' technology implementation vendor.



Figure 1: DHS's Strategic Priorities

## Solution

The DHS Interactive tool is a, cloud-hosted, enterprise reporting platform that provides DHS users with data storage, data integration, data management, and reporting, combined with analytic capabilities designed to enhance DHS operations through informing decision making processes.

- Identifying providers who support individuals with disabilities in gaining and maintaining employment
- Looking at performance of our Medicaid Behavioral Health Manage Care plans in reducing readmission rates and improving follow up services
- Identifying areas with limited subsidized child care options compared to the number of children eligible for subsidized child care so that outreach and investment resources can be focused in those areas
- Monitoring operational trends such as investigations and application processing timeliness in processing child clearances and provider applications in order to improve efficiency

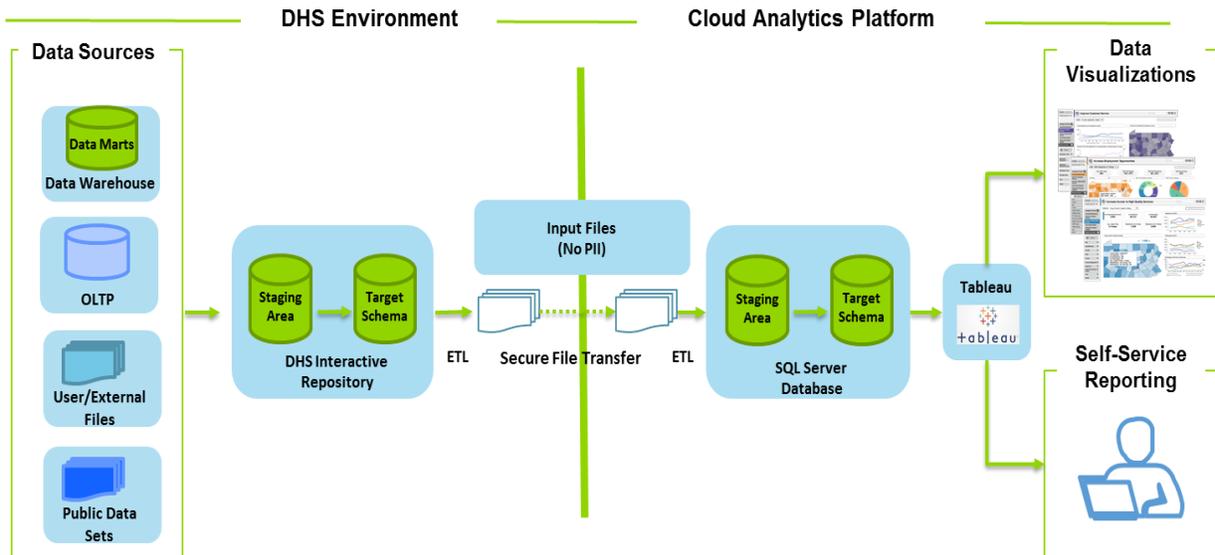


Figure 2: Example Child Care Dashboard

The DHS Interactive solution provides a cloud-hosted analytic architecture to standardize, consolidate, and integrate information across the DHS enterprise in order to support the types of decision making activities identified above. The architecture enables enhanced data management and data quality to ensure that users have detailed information to support their analysis. Specifically the solution leverages:

- **Data Visualizations and Advanced Analytics** - Provides users with advanced insight and analysis into their data through interactive dashboards and key performance indicators.
- **Self-Service Reporting Environment** - Allows business users to leverage advanced data visualization tools and bring in their own local data sets to build out their dashboards and reports.
- **Cloud-Hosted Platform** - Leverages a cloud-housed platform with broad analytic capabilities to meet not only the current needs, but future analytics needs as well.
- **Data Security** - Utilizes a cleansing process to remove all PII and PHI data prior to loading from the source systems, along with a highly secure infrastructure which is SOC1, SOC2, and FedRAMP compliant.
- **Secure File Transfer Protocol (SFTP)** - Established to securely transfer input file templates to the analytics cloud.
- **Extract, Transform, and Load** - Processes to automatically extract, organize and cleanse data from a variety of data sources and source files and transform/ load the data into a structured repository.

- **A Scalable Enterprise Reporting Data Model** - Stores DHS data in a robust de-normalized data model optimized for reporting and analytics.



**Figure 3: DHS Interactive Architecture**

In total 19 dashboards and over 200 different KPIs were created in the DHS Interactive tool. Throughout this initiative, DHS' Bureau of Information Systems team members worked side by side with the technology vendor to build their understanding of the toolset and the DHS Interactive platform. By the end of initiative, the BIS team had reached a level of proficiency with the solution that allowed them to own the implementation of certain enhancements and the development of new KPIs. This provides DHS with the flexibility to determine the optimal level of implementation collaboration between their services vendor and the BIS organization on future initiatives.

## Significance

DHS Interactive is innovative in two important ways: its ability to deliver insights across the DHS organization and the way it harnesses the power and scalability of “the cloud”. DHS Interactive consolidates information from across the entire organization into a single tool, providing business intelligence and analytics capabilities across various organizational levels. This is significant, because through DHS Interactive, the critical insights derived from more informed data analysis are now made available to agency leadership and program office staff alike. In addition, DHS Interactive leverages cloud-based, advanced data visualization technologies to provide the flexibility and capabilities the Department of Human Services required.

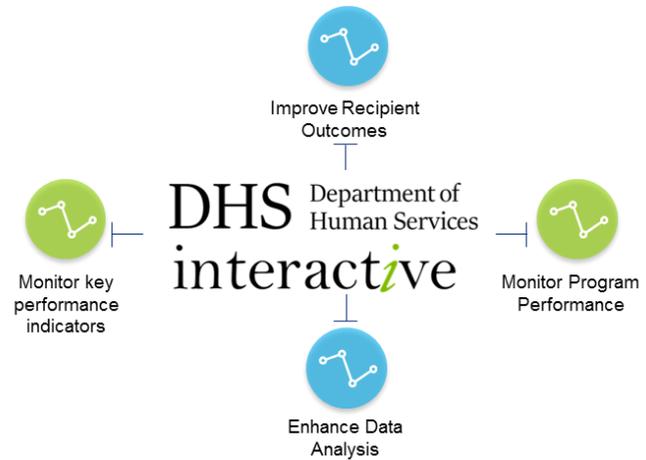
The tool automatically consolidates data into a standardized reporting repository and provides an intuitive user interface that allows users to quickly and easily derive analytical insights from their program data without having to search through hundreds of legacy reports, or manually piece together information from the various applications that exist across the department.

In addition to providing analytics and reporting capabilities across all levels of the department, DHS Interactive is significant in that it leverages advanced analytics and data visualization toolsets enabled through by a cloud platform. By leveraging the cloud and the BIS team’s side-by-side development activities, DHS has access to advanced data visualization capabilities without making a potentially costly investment in a new analytics and data visualization platform and has a team of trained BIS team members who can take ownership of the tool.

The end result? A tool that provides users with the ability to quickly and intuitively monitor and compare performance across multiple programs and gain valuable insights into the services being delivered to citizens in a way that few states can today.

## Impact

DHS Interactive integrates data across the organization, improves data governance, minimizes redundancy and duplication, provides transparency into program performance as it relates to DHS’s strategic priorities, and enables users to generate insights without increasing demands on the IT organization. As a result, DHS Interactive enables DHS to address some of its most pressing challenges:



**Figure 4: Capabilities of DHS Interactive**

✓ Helping to move consumers to self-sufficiency	✓ Improving program monitoring and ongoing tracking
✓ Enhancing and modernizing program integrity	✓ Increasing access to care
✓ Improving customer service and support	✓ Enhancing service delivery quality and health outcomes
✓ Identifying and addressing operational bottlenecks	✓ Supporting insight driven decision-making

DHS interactive not only provides the insights and analysis to answer the most pressing business questions facing Pennsylvania’s Department of Human Service today but also becomes a scalable platform for the state to deliver additional strategic and even new program level operational insights for future expansion as new business questions emerge. This is achieved by combining cloud-enabled analytics with organizational leadership willing to embrace their information as part of their performance review and decision-making process.

Overall, the goal of DHS interactive is to help DHS leverage two of its most important assets – its people and its data. Whether understanding the past, analyzing the present, or anticipating the future, DHS Interactive helps position users with the right insights to make the right decisions to improve the lives of the citizens being served. The result is a tool that enables business users with access to previously untapped and un-analyzed program data, aggregated through hundreds of key performance indicators. These insights provide users with the key programmatic and policy insights needed to make strategic decisions and inform policy analysis that will continue to support outcomes aligned with state priorities for years to come.

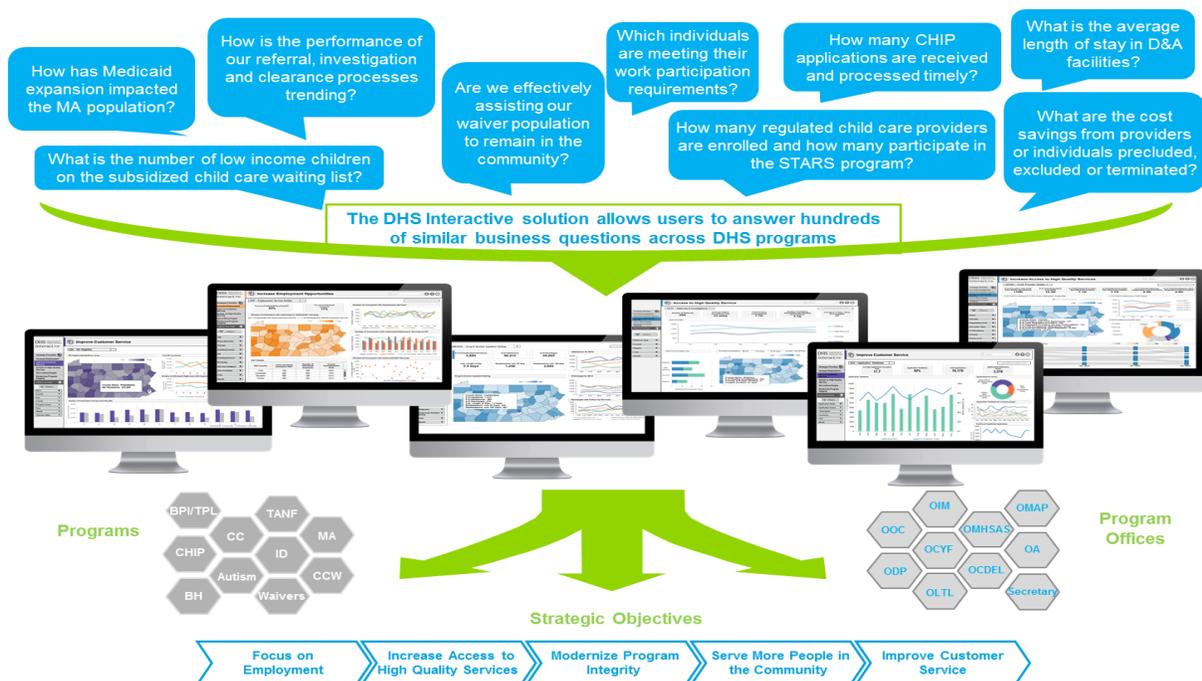


Figure 5: DHS Interactive solution