

### **Improving the customer experience with analytics**

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In 2015, customers are powerful. Through technology, they have instant access to information about products, services, and brands, which enables them to make informed decisions and socialize their reviews and feedback with others. In this environment, organizations are reinventing themselves to systematically understand and serve customers. They are focusing on improving their customers' engagement and experience.

For both the White House and the United States (U.S.) Census Bureau, the customer is a core area of focus. Under Executive Order 13571, “the Federal Government has a responsibility to streamline and make more efficient its service delivery to better serve the public.” In an address to the Association of Public Data Users, U.S. Census Bureau Director John Thompson explained that for the Census Bureau, “it is vitally important that we deliver the statistics that tell the story of America’s people, places and economy to our customers in a manner that is customer-focused and allows them to make data-driven decisions easily.”

This emphasis on customers is especially timely as the U.S. Census Bureau transforms its digital experience with new methods of data dissemination and research-driven innovations. Our transformation is fueling demand for insights into the end user's customer experience in order to drive decisions about products and services. A clear understanding of customer interaction, using metrics and analytics, is key to successful decision-making.

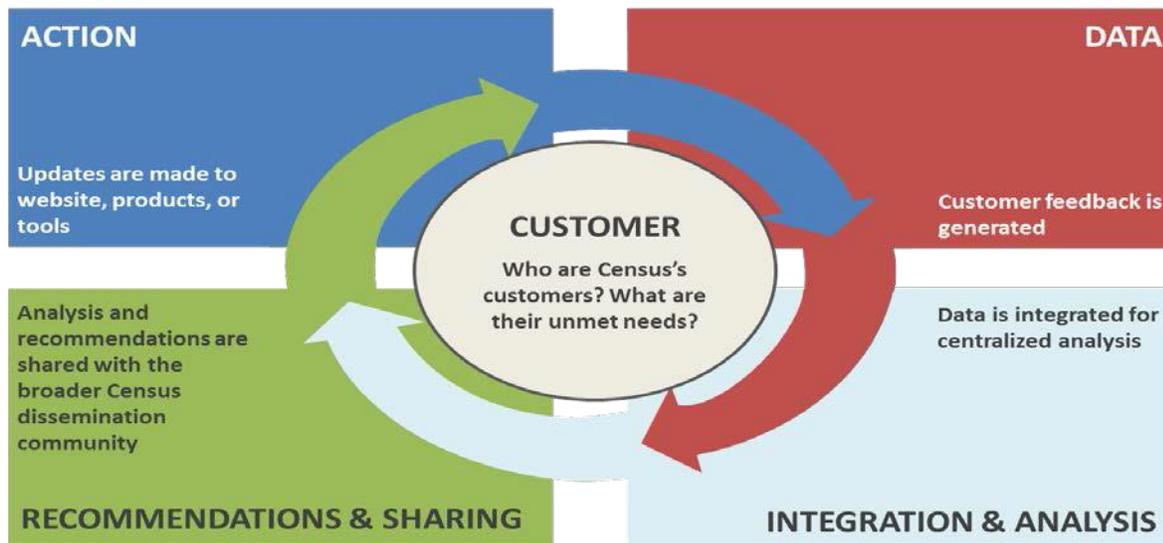
To improve the experience of our customers – both data users and survey respondents – the Census Bureau needs to consistently capture information about customer interactions. This requires investing in real-time, actionable data, business technology and metrics that assess and measure retention and customer satisfaction. Insights derived from data analysis will drive business decisions.

To that end, the Census Bureau has undertaken the Customer Experience Management (CEM) project. This project specifically aligns with our Strategic Plan, which lays out goals of managing and analyzing customer experience, increasing the effectiveness of stakeholder engagement, and increasing the visibility and utility of Census Bureau products. The plan also outlines the development of Customer Experience Management capability and a stakeholder management infrastructure to support our major statistical programs.

The CEM provides business intelligence from a growing number of Census Bureau data sources in a shared, central platform. The initial approach was to capture customer interactions with Census Bureau products, tools, and services in order to provide insight. Crucially, this system integrates previously stove-piped data sets by ingesting them into a centralized data warehouse and using a common coding schema. This enables users to have multiple views of the same customer segments across various channels (such as web, mobile, social, and contact center) and programs. In order to deliver timely insights into consumer behavior and organizational operations, the platform was designed and architected to enable the addition of different data sources from across the organization.

*Customer as the Center of Data Dissemination Transformation (Figure 1)*

Figure 1 below represents the customer-feedback live cycle from data capturing to decision-making with actionable results that aims to improve the customer experience.



In near real-time, the CEM platform provides dashboards and visualizations of interactions that give Census leadership a multi-faceted view of customer needs and expectations. The visualizations encourage and enable deeper exploration, giving management timely data to make better customer-focused decisions.

**Capturing and Coding Data**

Our first step in operationalizing the CEM project was standardizing the capture and coding of customer engagement data. Currently, individual offices that interact with customers determine what information about those interactions to capture and how to code it. At best, this leads to

inconsistent data collection; at worst, it leads to missing information about interactions. We don't know, for example, what educators think of agency products and services, because customer metrics do not consistently capture that a user is an educator.

Moreover, this means that customer behavior and feedback data resides in disparate data stores, some internal and some in external cloud-service providers. Consolidating data is a tedious and time-consuming process. The CEM project seeks to minimize manual consolidation efforts, and instead automatically centralize all data sources into a common data store of customer experience information.

To do this, the Census Bureau needs a common set of information captured at each interaction and a common set of codes used in data capture. The CEM meets this need through *common variable coding*. A robust and common coding system will let the Census Bureau to analyze customer feedback data from all current sources. This approach allows for scalability and extensibility – it can be applied to data from other sources and organizations in the future. Individual data sources will be encouraged to adopt the common element language to simplify the CEM process, but mapping will take place within the data store in most cases.

This approach to common coding is iterative. It seeks out broad input to understand what information is most important to decision makers at the Census Bureau, and then to verify our understanding of the available data. The process began with determining what critical information the Bureau ought to capture from each customer interaction. The team then conducted extensive data discovery to gain access to the data sources and create inventories of the data in each source. Data from all sources were assessed and organized into high-level categories that aligned with the desired information. Within each category, similar data fields were mapped to each other. For example, a field labeled “American FactFinder” in one data source and one labeled “AFF” and in another source might both be mapped to “American FactFinder” in the mapping framework. Similarly, the fields “Email” and “Customer Email” could both be mapped to “Email.”

### **CEM Dashboard Visualizations**

The CEM pilot project helped automate the process, building a centralized customer experience data store and dashboard from five independent data sources. The dashboards establish a framework and foundation for integrating customer experience data, and provide insights into customer engagement. This allows agency leadership and analysts to leverage data across sources on a holistic business intelligence platform. In short, the CEM platform creates an opportunity to better understand patterns and trends of customer experience. In turn, that can lead to actionable improvement plans, through a framework and foundation for customer engagement

data integration. The CEM dashboard is an interactive, user-friendly and highly intuitive analytical tool. It immediately provides the user with an overview of key performance indicators.

The illustrations below show the initial dashboard implementation, as it relates to the digital transformation goals. The navigation is easy, with simple tabs on the header. The tabs represent the three important goals of CEM and the digital transformation initiative: 1) Increase Customer Satisfaction, 2) Grow Our Audience, and 3) Increase Awareness of Census Bureau statistics. A fourth tab lists all of the digital transformation key performance indicators. Later phases of the project will include additional data sources.

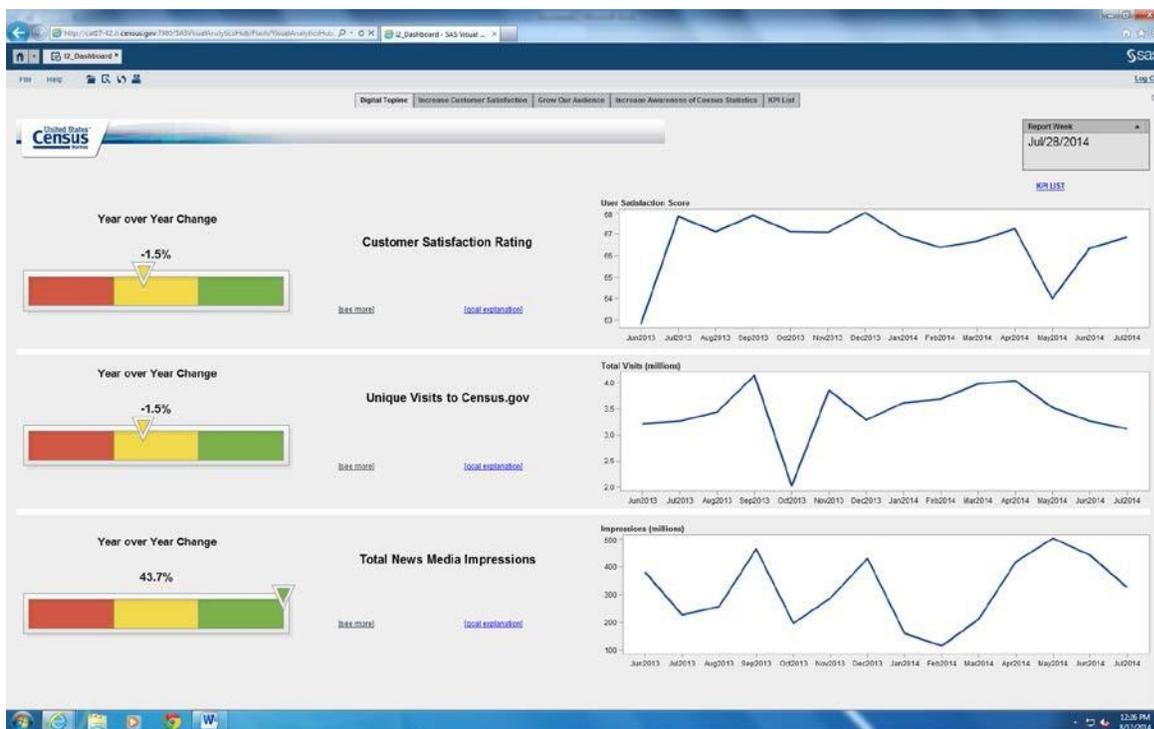


Figure 2: Digital transformation project goals. Data in this overview tab display year over year change percentages to each of the three CEM goals.

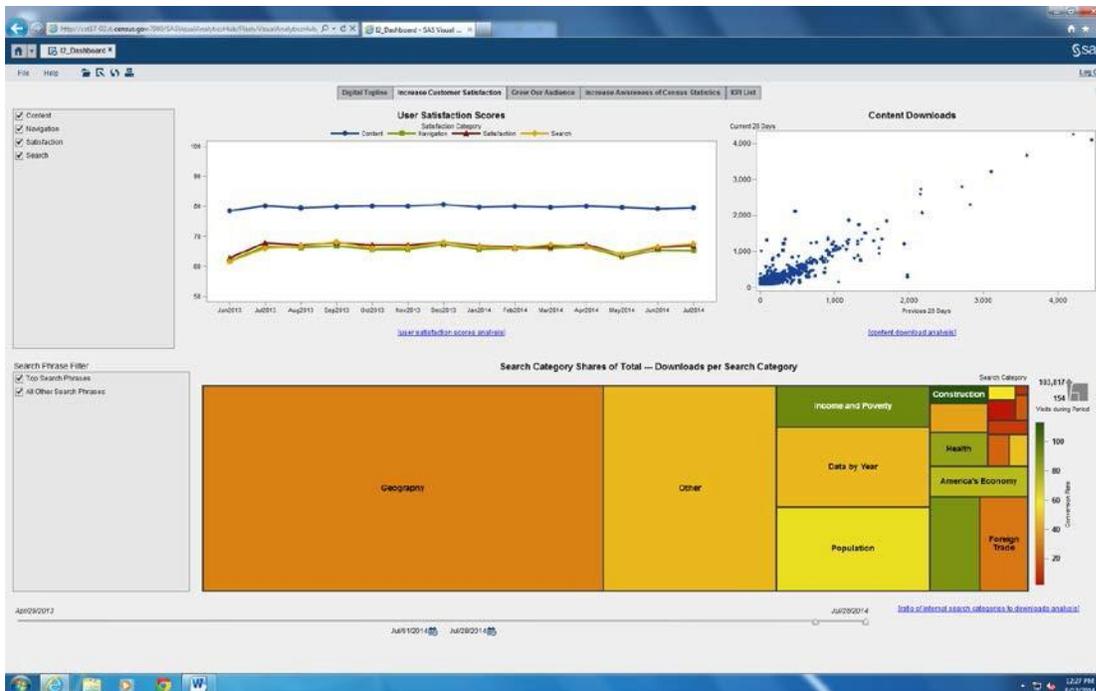


Figure 3: Increase Customer Satisfaction Tab – Visualizations in this tab relate to the first KPI. The User Satisfaction Scores graph displays the average scores from ForeSee surveys for each month. The Content Download Rates scatterplot compares downloads of files from the current 28 days to 28 days prior. The Ratio of Search Categories to Downloads tree map displays the internal search categories by number of visits and conversion rate (downloads/visits).



Figure 4: This tab contains visualizations that utilize data from ForeSee, SiteCatalyst, and Sysomos. The Social Media Mentions and Validated API Key Requests charts display data that comes from the manually added excel files. The remaining visualizations display data that comes from SiteCatalyst through the EMBEDDED\_WEB\_APPS, MOBILE\_VISITS, and REFERRER\_TRAFFIC Tier 2 tables. These visualizations allow the user to drill down to display daily level data.

## **Future Data Sources and Capabilities**

Moving forward, additional data sources of customer feedback will be added to the data warehouse to cover even more interactions with Census Bureau customers. Next steps may include the addition of social media data, and the creation of dashboards for monitoring performance metrics for the American Community Survey and the 2015 Census Test.

Additionally, new capabilities will be deployed for deeper analysis, better sharing, and customization of the dashboards. Potential capabilities include:

- *Text Analytics:* There are unstructured components to most of the data sources currently in CEM. Text analytics will allow for categorizing and analyzing sentiment, trending topics, early detection, and multiple languages.
- *Predictive Modeling:* Predictive modeling capabilities could be used to analyze customer behavior data and determine likely future behaviors.
- *Enterprise CRM:* An enterprise-wide tool to capture and manage customer interactions could improve the consistency of data capture.
- *Collaboration:* Additional collaboration functionality would allow for a more robust conversation about insights and discoveries from the CEM platform.
- *Customization:* Allowing individual users to customize dashboards could drive greater adoption of the tool.

## **Extensibility to the Enterprise Performance Management and Analytics Platform**

The CEM platform is designed with extensibility and flexibility in mind, so that it could be an enterprise solution for performance management and analytics. While the initial data sets are all customer interaction data, the underlying platform can be leveraged for use on data sources from any program or operational area. Many existing programs, products, and tools could be factored into the broader CEM architecture, providing an enterprise view of Census Bureau operations. In addition, some corporate functions such as finance and budget have multiple systems where information is housed. The CEM architecture could be used to create an executive-level corporate function data warehouse with interactive visualizations that show spending on projects versus projections over time. Human resource analytics may also be a future integration point within CEM, providing insight into agency-wide personnel activities.

## **Conclusion**

The CEM platform represents a fundamental rethinking of how we approach business intelligence and customer feedback. Tracking, using, and responding to information about customer interactions represent a powerful way of guiding agency decision making. Operationalizing the CEM platform is a big undertaking, involving widespread changes to the way we capture and code customer engagement, but the result will revolutionize our understanding and anticipation of our customers' needs and expectations. The platform will improve our ability to fulfill our mission and create value for the American public.