DHS Science and Technology Directorate

Data Analytics Engine – Transforming Data to Decisions

Enabling User-Focused, Data-Driven Solutions

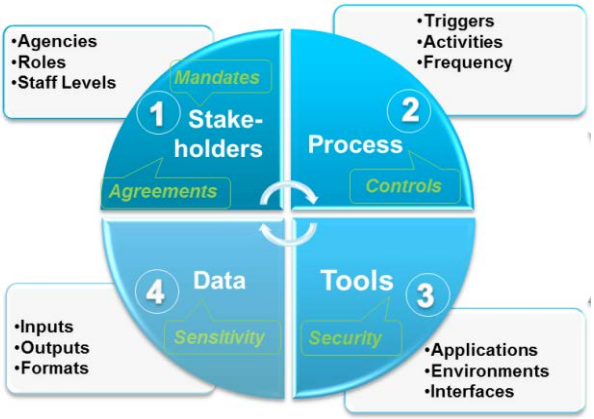
Over 60 pounds of gear and countless hours of training help support our nation's firefighters, but timely and accurate situational awareness remains a challenge. How can data analytics assist decision makers and first responders such as firefighters? By applying data-driven insights about building type, time of year, and other aspects of previous fires, firefighting teams can identify trends and patterns to better protect themselves and our communities.

The DHS Science and Technology (S&T) Directorate's Data Analytics Engine (DA-E) applies leading-edge computational data analytics research and development (R&D) techniques to enable user-focused, data-driven solutions for DHS missions. DAE is the crosscutting S&T resource for subject matter expertise and technical capabilities in data storage, security, computation, analysis, and visualization to the Homeland Security Enterprise (HSE), which includes DHS and its public and private sector partners.

State-of-the-Art Data Analytics Laboratory

DA-E maintains and operates a state-of-the-art data analytics laboratory to support mission-relevant evaluations of emerging technologies, rapid experimentation, and strategic R&D efforts. The lab infrastructure complies with privacy authorities and maintains security accreditation, allowing DA-E to use operational data to help DHS identify enterprise data analytics architectures and solutions. With over two Petabytes of storage capacity, 100+ servers and multi-tenant users, the DA-E lab serves as a centralized resource where end-users, technology experts, and other stakeholders can develop and test hypotheses and methods.

The DA-E lab also identifies and supports transitioning computational data analytics technologies to operational use in the HSE. The lab ensures solutions minimally impact end users' existing architectures and work flows, with consideration to costs and scalability. Developing and integrating statistical analysis and knowledge products allows mission outcomes and efficiencies to be measured or traced.



Assessments, Experimentation, and Strategy: Making More of the Data

DA-E enables program success by conducting:

(1) Emerging Technology Evaluations: DA-E evaluates potential game-changing tools or technologies to determine added-value and the capability to meet DHS mission needs. Evaluations involve requirements identification, market analyses, industry surveys, and hands-on testing and analysis/evaluation of mission-relevant use cases in the DA-E lab.

(2) Rapid Experimentation: DA-E conducts rapid experimentation to review data analytic technologies; provide preliminary results of data analysis on DHS operational data; and prototype solutions. The DA-E lab performs statistical data analysis on ingested data; documents use cases and requirements; evaluates analytic tools and methods against real data; and investigates data enrichment opportunities.

(3) Strategic R&D: DA-E develops and maintains engagements with national, industry, and academic labs. These strategic partnerships enrich DA-E's R&D with cutting edge research in areas such as algorithm evaluation for enhanced risk-based screening, improved fraud detection, information sharing, secure cloud computing, automated reporting, and autonomous systems.

The DA-E mission extends beyond data analysis to examining human interfaces between the end-users and the technology and helping document and develop business cases for data-directed investments. DA-E also cultivates and maintains relationships within S&T, the HSE, and partners to ensure successful transition of the best, cost-effective solutions.

Homeland Security
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To learn more about the S&T Apex Data Analytics Engine, contact SandTBigData@hq.dhs.gov.

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