

Empowering ERM Programs with Advanced Data Analytics

Risk data analytics generate insights that increase the value ERM delivers to an organization.

Insights generated from a data analytics capability informed by ERM program data amplify the success of risk-enabled performance management to yield a higher likelihood of achieving strategic goals and mission objectives.

Today's federal leaders are stewards of vast amounts of data generated from millions of daily transactions that result in billions of lines of information. Within this repository of data reside clues that, when linked to key risk indicator data generated through an ERM program can provide leadership and business process owners with **risk-intelligent information to achieve desired performance outcomes.** The ERM programs of tomorrow are beginning to recognize this opportunity and view risk data analytics as a "must have." These analytics can provide agencies with the capability to efficiently manage, join and analyze the large data sets generated by federal agencies to identify predictive patterns and trends that cannot be efficiently discerned through the limited data insights generated from manual processes and limited tools.

Risk data analytics can provide the skills, processes and tools needed for analyzing large populations of data to produce actionable insights, reduce risk, predict potential adverse events and create and maximize value. Risk data analytics, when integrated into core ERM activities, such as risk governance and oversight, risk identification and assessment, risk reporting and risk monitoring, become core ERM competency and have a role to play throughout the ERM life cycle.



Our ERM and Data Analytics Teams

- Guidehouse's ERM practitioners bring industry-leading capabilities for developing and implementing risk management frameworks and principles while also evolving existing ERM programs.
- This includes expertise and experience in standards such as the Committee of Sponsoring Organizations of the Treadway Commission (COSO) and the Government Accountability Office Green Book.
- Our Data Analytics team is made up of over 50 dedicated analytics and data science professionals from a variety of backgrounds, including: Statistics, Operations Research, Mathematics, Systems Engineering, Computer Science, Economics, Biostatistics, Social Science, and Business.
- By combining industry-proven, cutting-edge analytic techniques with the modern technology stack, we help clients optimize their data assets, improve operations, and most importantly, mine data to make evidence-based decisions.

Integrating Advanced Data Analytics into an ERM Program

Building a risk data analytics capability begins with leveraging risk data the organization has already collected and analyzed to document the risk landscape in which it operates. Risk profiles, risk assessments, and risk mitigation strategies are examples of useful descriptive analytics data sets that can be linked to larger datasets (e.g., grants liabilities, public safety information, cybersecurity performance metrics) to make discovery, interpretation and exploitation of data possible. Organizations can link these data sets to identify key risk indicators that can help it anticipate and mitigate adverse events before they can impact operations by using statistical analyses, forecasting, and predictive modeling to enable ERM program optimization. The insights generated from predictive analytics yield opportunities that allow an organization to more effectively manage enterprise risks that could impede its ability to meet strategic goals and objectives.

Benefits of Integration

- More effectively anticipate risks and opportunities.
- More effectively engage in correlational analysis to link risk data from across the organization to leverage resources/capabilities.
- Reduce inefficiency that exists in organizational silos, optimize existing information assets and address disconnects between different functions of an organization.

Descriptive Analytics Reveal	Predictive Analytics Enable	Advanced-Data Analytics Yield
What happened?	Statistical analysis	Data-driven, risk-based decisions
How many times did it happen?	Forecasting/extrapolation	Innovation to meet emerging risks
What exactly is the problem?	Predictive modeling	Opportunities within an Agency's risk tolerance range
What actions are needed to reduce risk exposure?	Optimization	Key risk indicators that function as early warning signals

Our Work in Practice



Guidehouse implemented an intelligent automation solution to remediate deficiencies within the grants management process that resulted in effectively mitigating the risk of not meeting reporting objectives.

Challenge: HUD's existing financial management organization struggled to adequately validate estimated accrued grant liabilities due to various internal control deficiencies. The Department was found non-compliant because of issues relating to lack of relevant data, incomplete documentation, and misinformation, placing the agency at risk of not meeting its reporting objectives.

Solution: Guidehouse began by creating current and future state process flows for the CPD Accrual Validation Process and identified areas for improvement. Next, Guidehouse analyzed and reconciled grant data to confirm that data was consistent and developed a solution using both robotic process automation (RPA) and open-source data analysis tools to automate the CPD Accrual Validation future state process. The results generated an estimated grant liabilities accrual in a fraction of the time previously taken to produce manually with an auditable trail to validate the data. The final estimated grant liabilities information was delivered to the OIG in a CPD Audit Ready Package.

Relation to Agency's Enterprise Risk Management: Our CPD Audit Ready Package allowed HUD to better understand its current state grants management inefficiencies that increased its reporting risks, such as the long process time needed to manually validate large data sets. The team leveraged this insight to create an intelligent automation solution that was faster and more accurate than the manual alternative – reducing process time by 97% from 2100 hours over six and a half months to 65 hours over three to four weeks. The reduced processing time and automated data validation resulted in increased accuracy that could be confirmed through an audit trail. The use of advanced data analytics capabilities reduced the risk of HUD not meeting its financial reporting objectives.



Guidehouse developed an innovative approach to visualizing safety risks along potential traffic routes.

Challenge: Transportation decision-makers have a limited number of analytical visualization tools available that reveal insights, and even fewer focused on safety and prevention of serious crashes. With the rapid growth and advancement in technology, the opportunity to combine the volume and variety of transportation data now collected by the public and private sectors enabled greater insight into transportation safety risks.

Solution: We developed and implemented our GuideSafe Insight Tool that consists of two main visualizations. Our Route Risk Visualization enables the general public to map the fastest route to their destination while comparing the relative safety of each route, using kernel density estimation (KDE) models to generate traffic risk zones. Our Conflict Point Risk Visualization allows DoT stakeholders to visualize high-risk intersections in a city or area, using machine learning models that evaluate the relationships between the transit environment and incident rates.

Relation to Agency's Enterprise Risk Management: Our GuideSafe Insight Tool has educated and increased awareness in the general public, allowing for safer commutes and a better understanding of transit systems. It also allows DoT decision-makers to underpin their safety strategies with a robust analysis of transit safety factors, operators to understand the effectiveness of their incident management strategies, designers to evaluate the current design of existing transit systems, and stakeholders to discover new insight into the impact of weather on safety. This tool enhances the DoT's ability to meet its mission to provide a fast, safe, efficient, accessible and convenient transportation system.



Guidehouse has helped the Cybersecurity and Infrastructure Security Agency (CISA) improve cybersecurity performance metrics using advanced data analytics to enhance reporting of performance results using visualization techniques.

Challenge: CISA is responsible for protecting the Nation's critical infrastructure from physical and cyber threats. This requires significant coordination and collaboration among a broad spectrum of government and private sector organizations, including evaluating programs using a collection of metrics.

Solution: Guidehouse conducted an initial analysis on the current metrics and developed a list of recommended changes based on the effectiveness of the metric and clarity of the question. Our team developed new metrics based on Administration priorities and key cybersecurity performance indicators. We have used the data-driven approach to highlight correlations and visualize trends that are informed by the Federal-wide reporting. Lastly, we developed processes to ingest incoming data and a centralized analytics platform to create a collaborative environment across the Cybersecurity Division with near real-time information. This included standing up a Tableau Server environment with 250 users across DHS.

Relation to Agency's Enterprise Risk Management: Guidehouse was able to reduce the amount of data elements being asked of Federal agencies by around 20% over multiple years. This effort has helped reduce the reporting burden of Federal agencies while also more effectively identifying the performance of each agency's cybersecurity program. Our team's support continues to improve the value proposition for Federal agencies, by more accurately gathering data, asking the correct measures, and providing feedback through impactful visualizations and analysis. These efforts allow agencies to more effectively manage cybersecurity risks through the identification of key cybersecurity performance indicators.

About Guidehouse

Guidehouse is a leading global provider of consulting services to the public and commercial markets with broad capabilities in management, technology, and risk consulting. We help clients address their toughest challenges with a focus on markets and clients facing transformational change, technology-driven innovation and significant regulatory pressure. For more information, please visit: www.guidehouse.com.

Email: erm@guidehouse.com

Web: guidehouse.com

 [@guidehouse](https://twitter.com/guidehouse)

 [linkedin.com/company/guidehouse/](https://www.linkedin.com/company/guidehouse/)