Forensic data analytics
Globally integrated compliance review, litigation support and investigative services
EY's forensic data analytics (FDA) combines the extensive use of big data and statistical and qualitative analysis, in conjunction with explanatory and predictive models, to guide and identify issues and areas warranting further review. Our fact-based evidence drives actionable business decisions, focuses investigative efforts where it matters and optimizes outcomes. Our suite of FDA service offerings comprises proactive and reactive methodologies that leverage the information contained in large-scale, structured and unstructured client data sets. This allows us to more efficiently detect and investigate instances of error, waste, misuse, abuse, corruption, noncompliance and fraud, or to assist in a regulatory or litigation response. With the integration of third-party data into our suite of FDA tools, our professionals are able to effectively exploit internal data with relevant external or third-party intelligence such as country sanctions lists, legal proceedings or adverse media checks. EY's FDA platform avoids unnecessary client costs by transforming large disparate data sets into actionable analyses and patterns that assist in answering the critical questions at issue.

Data is everywhere. From complex general ledger accounting systems to network security and social media, it is the all-encompassing backbone of corporate America. If you are responding to litigation issues or regulatory demands, are engaged in an investigation or are trying to prevent one, you will need to understand complex data sets from multiple sources within your business. The key to making sense of and commanding this rapidly expanding frontier is to effectively leverage new technology in conjunction with subject matter professionals who are focused on the relevance to your industry.
EY is positioned to meet the complex and evolving demands of the current business landscape by leveraging our people, processes and technology. Our service offerings are managed and performed by industry professionals, globally integrated for standardized methodologies and practices, and executed with advanced technology. Our FDA service offerings are integrated across international borders. Our FDA teams around the world bring together their local experience to handle simultaneous multinational assignments on tight deadlines. These professionals are familiar with local data transfer and privacy rules, state secrecy laws and other local requirements affecting international forensic data analytics. Each of our FDA professionals, regardless of location, is trained to adhere to our internal procedures for handling structured and unstructured data and to leverage our common technology platform. Our common global technology platform further supports this integration. We coordinate research and development in forensic labs positioned in strategic locations around the globe to provide an FDA platform to manage multiple challenges: small, large, common or unique. For large matters, our data centers are standardized on several advanced hosting and review platforms. In cases where our technology must be complemented to meet your specific needs, our teams remain flexible to adapt to your IT solution set. Additionally, our team can deploy our full suite of FDA products in a fully secure mobile environment that sits within your data infrastructure protected by your data security protocols.

**EY’s global FDA footprint**
Investigations and dispute services
EY offers customizable, industry-specific analytics solutions that leverage various forms of data such as accounting, supply chain data, marketing, logistics, social media, internet/intranet, business intelligence and audio/ Voice over Internet Protocol (VoIP). These solutions are designed to assist our clients in answering the unique challenges to their industry.

Decision support
Complex business decisions require complex decision support analysis. EY’s decision support management tools are an internally developed, web-based, interactive environment that manages client data from receipt through archival, allows multiple users real-time access to the data and documents, and provides a fast and easy mechanism for complying with regulatory requests and investigation or litigation demands. The tool is further supported by independent verification and validation tests through the tools reporting and analytics function to enhance consistency in the decision-making process.

Anti-bribery and corruption (ABaC) analytics
EY has collaborated with the Association of Certified Fraud Examiners and leading global organizations to develop a library of innovative anti-fraud/anti-corruption analytics to choose from that are customizable on a case-by-case, country-by-country basis. The key differentiator that makes ABaC analytics a preferred choice is the risk-based approach that quickly identifies target areas for internal audit and compliance testing, integrating structured and unstructured data elements targeted to identify potentially improper payments.

Anti-money laundering and compliance
The combination of anti-fraud and anti-money laundering (FRAML) is a recently developed model that aims to increase the parity and transparency of data sources and information through the consolidation of fraud and anti-money laundering (AML) resources. FRAML attests that in addition to the compliance procedures, AML investigations must include a team of knowledgeable professionals from the compliance, legal and fraud departments, who not only have experience within their respective fields but also have the capability to adapt their investigative techniques to the AML environment.

Third-party due diligence
The economic crisis, recent governmental enforcements and the increased focus on enterprise risk are causing global corporations and their audit committees to take a closer look at how they manage their vendor and customer compliance relations. EY has assisted many companies in dealing with these issues and has industry experience in building compliance programs that address known vendor corruption risk.
Global industry sectors

- Asset management
- Media and entertainment
- Automotive
- Mining and metals
- Banking and capital markets
- Oil and gas
- Cleantech
- Power and utilities
- Consumer products
- Private equity
- Government and public
- Real estate
- Insurance
- Technology
- Life sciences
- Telecommunications
Our FDA process

Today, an hour’s worth of business for a typical Fortune 1000 company can create millions of transactional records. The entirety of data from the private sector doubles every 14 months. Big data is no longer a phenomenon but a vastly expanding data footprint in our everyday course of business. This data footprint is at the core of most regulatory matters, investigations and complex business issues.

Our FDA professionals, including certified public accountants, certified fraud examiners, business and computer science professionals, and industry subject-matter professionals, employ advanced analytics, relationship forensics, linguistics analysis and data visualizations tools. These tools allow the data to define itself and can automatically detect inconsistencies within large amounts of transactional data. Complementing their depth of experience in sophisticated multinational investigations and cases, they include internationally recognized thought leaders in forensic data analytics who have led many high-profile matters involving a wide range of compliance, regulatory and litigation proceedings.

Relationship and entity link analysis

EY FDA process

Our process begins with a thorough understanding of your business, industry and specific challenges associated with forensic data analytics. We deploy model-based analytics that help answer the following questions:

- Who is talking to whom?
- What are they talking about?
- Who is involved?
- When did it start?
- Over what time period has it taken?
- What is the magnitude?
- What are the outliers?
- Is my risk/compliance approach effective?
- Are there unidentified areas of risk within my organization?
- What was the root cause?
Beyond traditional “rules-based” queries and analytics

**FDA method maturities**

Our approach to forensic data analysis incorporates targeted model-based mining and visual analytics tools that allow the data to “speak for itself.” When deployed over large data sets, our analytics can be a powerful tool to identify large and unusual transactions or anomalies derived from the multidimensional attributes within your data. Model-based mining, which leverage our suite of FDA analytics techniques to shift the focus to high-risk areas where controls may not necessarily exist or are perhaps even bypassed. We integrate our visual analytics approach to assist counsel with identifying patterns in the data that can be more clearly defined as demonstrated below.

<table>
<thead>
<tr>
<th>False Positive Rate</th>
<th>Detection Rate</th>
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<tbody>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
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**Structured Data**
- Matching, Grouping, Ordering, Joining, Filtering
- “Traditional” rules-Based Queries & Analytics
- Anomaly Detection, Clustering Risk Ranking
- Statistical-Based Analysis

**Unstructured Data**
- Keyword Search
- Traditional Keyword Searching
- Data visualization, Drill-down into data, Text Mining
- Data Visualization & Text Mining

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**Representative business application examples**

- **EY’s multi-format data conversion platform** transforms and integrates disparate data sets regardless of their source systems to support various regulatory matters, litigation support, fraud investigations and disputes, third-party due diligence, anti-bribery and corruption investigations, compliance review, decision support and more.

- **FDA’s artificial intelligence analytics rules-based methodology** applies business rules logic and or regulatory or litigation requirements to identify and understand data populations.

- **Large-scale data link analysis** can be leveraged to trace complex financial transactions, visualize entity and relationships, and identify anomalous patterns.

- **Text mining, sentiment analysis and concept mapping** can be used in fraud, corruption, waste and abuse matters in an effort to identify transactions, e-mail, or text based data that has terms or phrases of known concern and or to detect the emotions associated with the data.

- **EY’s FDA approach** also combines the extensive use of statistical and qualitative analysis to identify data of interest based on the facts of the investigation, litigation matter or dispute.

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<table>
<thead>
<tr>
<th>FDA technique</th>
<th>Representative business application examples</th>
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<tbody>
<tr>
<td><strong>Multiformat data conversion</strong> Using data-extraction techniques that support multiple enterprise resource planning system and other data sources into customized formats for on-demand analytics</td>
<td>EY’s FDA approach also combines the extensive use of statistical and qualitative analysis to identify data of interest based on the facts of the investigation, litigation matter or dispute.</td>
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<tr>
<td><strong>Artificial intelligence analysis</strong> Using model-based analysis automate the investigative process by combining evidence from various methods and data sources</td>
<td>FDA’s artificial intelligence analytics rules-based methodology applies business rules logic and or regulatory or litigation requirements to identify and understand data populations.</td>
</tr>
<tr>
<td><strong>Large-scale data link analysis</strong> Linking techniques that incorporate direct and fuzzy matching with indirect sequence comparison and multilevel matching</td>
<td><strong>Large-scale data link analysis</strong> can be leveraged to trace complex financial transactions, visualize entity and relationships, and identify anomalous patterns.</td>
</tr>
<tr>
<td><strong>Text mining, sentiment analysis and concept mapping</strong> Extracting information from text sources through statistical learning and natural language analysis</td>
<td><strong>Text mining, sentiment analysis and concept mapping</strong> can be used in fraud, corruption, waste and abuse matters in an effort to identify transactions, e-mail, or text based data that has terms or phrases of known concern and or to detect the emotions associated with the data.</td>
</tr>
<tr>
<td><strong>Statistical inference, representative sampling and hypothesis testing</strong> Verifying hypotheses and assumptions by means of query design and/or representative sampling and statistical inference</td>
<td>Relationship visualizations and transaction analysis can be applied to various investigative and dispute cases helping to provide clarity around how people, data and entities are connected.</td>
</tr>
<tr>
<td><strong>Relationship visualization &amp; transaction flow analysis</strong> Analyzing social networks, highlighting patterns of relationships and interactions between people, entities and events</td>
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Our reports convey our results in a visual manner for easy interpretation and anomaly detection so that general counsel, outside legal advisors, internal auditors, risk managers and IT professionals can identify issues and respond to regulatory inquiries, litigation, investigative and compliance issues. Our visual displays also can be used to help improve business performance, reduce unnecessary costs and identify unassuming areas of risk.

**FDA data representation**

- Automatically arranges individual points to make graph of data more comprehensible
- Graphical representation of relationships between seemingly discrete entities
- Epicenters of activity become immediately discernable

**Rapid-fire analysis**

- Easily transfer data between applications
- One-click export to Excel
- Easily identify commonalities between objects easily - e.g., customers with identical addresses
- Cull data by specifying a date range

EY has a proven track record in conducting large scale database investigations that have uncovered a variety of fraud schemes, including, but not limited to, check fraud, theft, corruption, Foreign Corrupt Practices Act violations, procurement kickback schemes, conflicts of interest and financial misstatement schemes.
Rogue employee comparison analysis

Accounts payable stratification analysis
On-site mobile data center

Many litigation, investigative and dispute matters require data or other electronically stored information to remain under lock and key on the client’s premises. EY’s FDA professionals can deploy our FDA platform on-site and on a global scale via our mobile data center (MDC). The MDC leverages EY’s FDA mobile computing technology while maintaining the client’s data privacy and security protocols.

Industry-leading technology
• EY’s full suite of FDA software supports custom configurations based on client requirements

Mobility
• Behind your firewall – fiber optic uplink connectivity to client’s network (10GbE)
• Portability – quick deployment of a powerful IT infrastructure to any country
• Closed network – elimination of privacy and security concerns
• Rapid implementation – operational in 60 minutes from site deployment

Scalability
• Processing – highly capable standard configuration with multiple options to enable higher levels of throughput
• Flexible network integration – high-speed network capability with options for access control ranging from tight integration to full air-gap stand-alone environment
• 5TB NAS storage – fast, reliable and redundant
• Stackable units – provides for scalability of up to eight units
• Enterprise-grade hardware – mobile to permanent solution via direct data center environment integration
About EY
EY is a global leader in assurance, tax, transaction and advisory
services. The insights and quality services we deliver help build trust
and confidence in the capital markets and in economies the world over.
We develop outstanding leaders who team to deliver on our promises to
all of our stakeholders. In so doing, we play a critical role in building a
better working world for our people, for our clients and for
our communities.

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