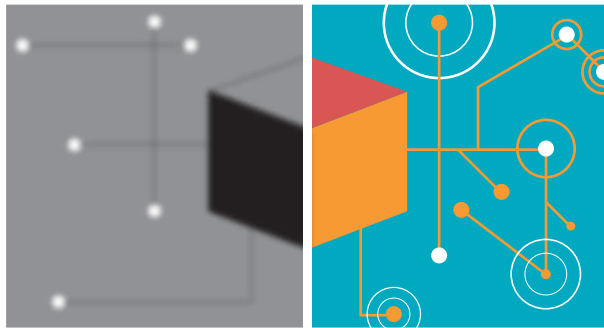# NOVETTA
ENTITY ANALYTICS

Empowering Customer Analytics, Fraud Detection, and Threat Assessment

Whitepaper

Most organizations use data integration, data warehouse and master data management (MDM) systems, and other enterprise applications to combine and store information pertaining to real-world entities that is used for business intelligence and analysis. This approach, designed around a centralized enterprise architecture, lacks the flexibility and agility organizations need to leverage growing volumes of data from many structured, unstructured and semi-structured sources.

Prior to the introduction of Hadoop, organizations had to make difficult tradeoffs between the value of keeping data for analytical trending and analysis and the high cost of real-time data warehouse storage. With Hadoop, organizations can easily and cost effectively replicate data from data warehouses and application logs to a data lake and make this valuable data available for modeling and analysis. However, organizations still lack a simple way to combine these large volumes of siloed data and make it useful for analysis by business intelligence, operations, and modeling applications. New advanced technologies are needed to combine large volumes of data from multiple sources on Hadoop and create advanced 360-degree views of people, organizations, locations, events and other real-world entities.

These advanced entity analytics applications must be purpose-built to perform the complicated processes required to rapidly integrate and resolve large volumes of data from many sources without disrupting ongoing operations or systems. They must also be able to discern details about entities, relationships, social networks, and trends and deliver them to analytics tools and applications for analysis. Organizations that leverage advanced 360-degree entity views of data will gain unique insights and realize greater value from their investments in Hadoop, enterprise applications and data warehouses.

Novetta Entity Analytics enables customers to find clarity from the complexity of Big Data at the scale and speed needed to drive enterprise and mission success.

Novetta Entity Analytics was initially built to provide advanced 360-degree entity views to government agencies that needed to identify and gain insights about people, organizations and other real-world entities of interest. The Department of Defense, federal law enforcement, and intelligence agencies have been using the technologies in Novetta Entity Analytics for more than a decade to create advanced 360-degree entity views of data from a wide range of third party sources that ambiguously reference the same real-world entities. These sources include email, social media, blogs, websites, news, travel data and other unstructured, sparse, fragmented, dirty or relatively ungoverned data. These organizations use the technologies built into Novetta Entity Analytics to quickly integrate and resolve data, and provide clarity and certainty about the entities and their relationships.

Novetta's team of data scientists have spent years measuring, analyzing and resolving diverse data types and designing repeatable, source-agnostic processes to construct highly accurate advanced 360-degree entity views of data from many disparate structured, unstructured and semi-structured sources. These proven processes, built into Novetta Entity Analytics software, rapidly combine large volumes and wide varieties of data and extract information about entities, their relationships, where they fit within hierarchies, and other complex behavioral and temporal patterns at enterprise speed and scale. Novetta offers Novetta Entity Analytics software solutions designed to help organizations perform advanced customer 360-degree analytics; detect risk, fraud, and abuse; and assess security threats. More details about each solution follows.

Advanced Customer 360° Analytics

Vast amounts of customer information exist today in call log, survey, service request ticket, transaction, clickstream, event and social data, but most of it goes unleveraged because it is not easily included in the master customer files produced by MDM and other systems.

With Novetta Entity Analytics, companies can create advanced customer 360-degree profiles by bringing together large volumes of operational, content, social and public data that is often difficult to combine today. These more comprehensive customer profiles provide companies with better insights about who customers are, their preferences and purchases, which new products are most applicable to them, the quality of service they are receiving, and their satisfaction with the company. The advanced customer views Novetta Entity Analytics creates can also be used to more accurately target individual customers, segment customer populations, make predictions about future behaviors, and detect patterns and trends.

Advanced customer 360-degree analytics solutions powered by Novetta Entity Analytics enable companies in financial services, banking, insurance, retail, global manufacturing, healthcare and other industries to build customer loyalty programs, create more personalized marketing offers and enhance customer satisfaction.

- **Building Customer Loyalty Programs**

  Novetta Entity Analytics brings together sparse and fragmented customer information to identify and build profiles of customers for use in loyalty programs. By combining and resolving registration data, warranty information from third party resellers, and other data, Novetta Entity Analytics is able to construct a customer profile and make it more robust by adding internal and external transactional data for use in behavioral and geo-temporal analysis. Business intelligence and predictive modeling applications are also able to generate targeted loyalty offers that customers care about and result in increased brand loyalty and brand stickiness.

- **Creating Personalized Marketing Programs**

  Novetta Entity Analytics combines a wide range of behavioral data with historical purchase data to create rich customer profiles for use in personalized marketing. Data can be segmented to detect preferences of similar customers to generate offers likely to be well received. In addition, information about relationships between customers or social hierarchies among them can be used to produce offers for parents, children, organizations or influencers. Finally, population segments, such as a company's most active buyers, can be presented with special offers to boost short-term revenue or meet other business goals.

- **Enhancing Customer Satisfaction**

  Novetta Entity Analytics integrates call log, survey response, email, clickstream and other data to create comprehensive views of entities, including their relationships, associations and hierarchies. These integrated views are extremely useful for assessing and improving customer satisfaction. For example, if a customer of a financial services company contacts a customer service representative at the company, and the representative can see that the caller's wife recently lodged a service complaint, the representative could offer the customer a premium designed to improve his or his family's customer satisfaction.

Improving Detection of Risk, Fraud and Abuse

Companies in many industries are increasingly driven to reduce loss, protect company and brand reputation, safeguard assets, and comply with industry and government regulations. They need to quickly identify individuals and organizations engaged in fraudulent or abusive activities, and avoid doing business with them in the future.

Novetta Entity Analytics combines and resolves operational, enterprise content, third party, social, public and other data from many sources to connect the dots and uncover entities trying to game or cheat the system. The software creates complete profiles of entities, detects patterns buried deep within data, and identifies activities and relationships between people, organizations, events, locations and other entities that don't fit normal behavior patterns. In addition, visual analytics tools allow analysts to view and traverse social networks of entities and identify activities or relationships that should be investigated further.

The risk, fraud and abuse solution powered by Novetta Entity Analytics allows companies across industries, including financial services, banking, insurance, healthcare and retail, to reduce economic crime by identifying potential risk exposures, fraudulent activities, and abusive transactions that manual processes and incomplete data analysis are likely to miss.

- **Improving Credit Risk Evaluation**

  Novetta Entity Analytics combines data from credit reporting bureaus, public records and social media with transaction and other internal data to build a more accurate and complete profile of a household for use in reducing an organization's credit exposure. For example, by adding social media and other public data, the software can identify householding relationships, such as spouses, children or grandchildren that may not be captured by traditional data sources. With access to this information, organizations can more accurately define entities that contribute to an individual's or a household's overall credit risk or credit worthiness.

- **Exposing Fraudulent Billing Activity**

  Novetta Entity Analytics combines transactional and public data sources to construct relationships, complete patient, physician, provider and payer profiles, and correlate relationships between claims and events to more accurately uncover and assess fraudulent actors and groups. By adding enterprise content to third party information sources, such as property, financial and incorporation records, Novetta Entity Analytics helps organizations identify unknown and undisclosed affiliations among physicians, medical groups and healthcare systems. When combined with patient medical history data, this data can pinpoint suspicious activities, such as the same services billed for the same patients by several associated providers.

- **Determining Who Not To Do Business With**

  Novetta Entity Analytics integrates internal data with watch lists from the Office of Foreign Assets Control (OFAC), World-Check, Bureau of Industry and Security, and other public data, such as property, financial and incorporation records, to better detect entities an organization should not be doing business with based on their past activities. By resolving entity data from all of these sources, Novetta Entity Analytics can uncover shell corporations and other suspicious entities that may be attempting to hide or obfuscate their identities. In addition, Novetta Entity Analytics exposes nonobvious relationships between companies and people that may be of concern and require immediate investigation.

Enhancing Security Threat Assessments

As global threats increase, safeguarding physical assets and human resources from danger is expensive and challenging for most enterprises. Internal sabotage, organized crime, civil protest, vandalism, terrorism, insurgency and piracy all pose risks to a company's assets, facilities, employees and contractors.

Many political organizations, terrorists groups, and civil protesters rely heavily on social and traditional media to spread their message and recruit support. If companies can efficiently and accurately extract the names of people, organizations and locations from open source media, and combine it with their internal security, facility and geo-asset data, they can monitor and analyze extracted entities and patterns to gain critical insights about potential threats. Although organizations can gather this type of data from a wide variety of sources today, acquiring it, correlating it with internal data, and creating unified profiles is often an extremely time consuming or impossible task.

Novetta Entity Analytics allows companies to combine internal security operational data with subscription feed, open source media, social media, internal and external watch list, blog and other data about people, groups, places, things and events, and quickly analyze the data to help expose and prevent physical threats. By bringing these types of information together to create a comprehensive operational picture, Novetta Entity Analytics makes it easy for analysts to quickly identify and assess the threat climate, hone their investigations and report findings The software allows analysts to view collaborative behavior patterns of specific people, organizations, geographies, events and operations around the world and traverse data to better understand the social networks of the entities they are targeting.

Security threat assessment solutions powered by Novetta Entity Analytics allow oil and gas companies, global manufacturers and other large enterprises to better protect physical and human assets in fixed locations or in motion, and guard cyber security infrastructure and data from attack.

- **Protect Facilities, Equipment and Personnel in Fixed Locations**

    Novetta Entity Analytics combines subscription, open source media, blog, social media and geo-location data with security operational data and correlates insights to make it easier to analyze, assess, and monitor assets, facilities and personnel. The rich information helps companies accurately evaluate location-specific activities and threat levels, and ensure that global facilities are adequately staffed and appropriate security protections are in place. In addition, advanced views of data can be used to improve security evaluations of new hires, especially those working in high-risk areas or operations.

- **Safeguard Assets in Motion – Human and Physical**

    Novetta Entity Analytics unites information about potential threats and locations in near real time, as data becomes available, to assist organizations in monitoring and protecting people and equipment in motion, from senior executives to tankers and freight. With Novetta Entity Analytics, organizations can better ensure the safety of assets traveling near areas of civil or political unrest, in danger from environmental or terrorist events, or at risk because of the political climates within countries where they are traveling.

- **Defend Networks and Data**

    Novetta Entity Analytics integrates security blogs and other third party information about malware, advanced persistent threats, and other cyber security threats. The information is used to detect names of malware, patterns of IP addresses, signatures, host names representing malware, co-occurrences of organizations,

people and products that may impact specific products or industry, and other malware indicators. Analysts can glean insights from the combined data about emerging malware indicators relevant to their industry and protect critical data by leveraging the indicators within enterprise firewalls, intrusion protection systems and other enterprise security applications.

Advanced 360° Entity Views Deliver Business Advantage

Novetta Entity Analytics software allows organizations to combine data from a wide variety of internal and external sources to create trusted, comprehensive advanced 360-degree views of real-world entities that are not possible with any other technology. The software is purpose-built to combine and resolve entity information; detect information patterns, relationships, and social networks hidden within the data; and provide analytics tools and applications with the ability to deliver greater, higher fidelity insights than ever before.

Organizations that deploy Novetta Entity Analytics solutions for advanced customer 360-degree analytics, risk, fraud, and abuse detection, and security threat assessment will gain significant competitive advantages and reduce financial and physical risks.

NOVETTA
From Complexity to Clarity.

Headquartered in McLean, VA with nearly 750 employees across the US, Novetta has over two decades of experience solving problems of national significance through advanced analytics for government and commercial enterprises worldwide. Grounded in its work for national security clients, Novetta has pioneered disruptive technologies in four key areas of advanced analytics: data, cyber, open source/media and multi-int fusion. Novetta enables customers to find clarity from the complexity of Big Data at the scale and speed needed to drive enterprise and mission success. Visit www.novetta.com for more information.

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WP102015