IBM Analytics
White Paper

Curing enterprise amnesia in law enforcement agencies

Leverage IBM InfoSphere Identity Insight to streamline relationship-based investigations

IBM

Executive summary

Organizations in virtually every industry are dealing with the enormous amount of structured and unstructured data that exists inside and outside the enterprise—and law enforcement agencies are no exception. While this information holds the potential to reveal deep insights about crime patterns and ultimately improve public safety, the overwhelming volume can cause agencies to overlook critical information that might affect new and ongoing investigations.

Leading law enforcement agencies are creating global master name indexes (GMNIs) to generate meaningful insights into identities and relationships. By automating the process of correlating information about individuals, their relationships and other objects in real time—across all available data sources—a GMNI can help agencies make sense of data that is already available to the department. As a result, it helps increase the efficiency of investigations, enhance public safety and eliminate unnecessary data discovery time and costs.

IBM® InfoSphere® Identity Insight uses advanced identity, relationship and event-processing capabilities to help agencies build effective GMNIs. Using InfoSphere Identity Insight, agencies can enhance identity information, improve relationship-based investigations and meet strategic objectives quickly.

Police departments' challenge: Improve speed to insight and impact

Like commercial corporations, police agencies are facing the problem of how to do more with fewer human and capital resources. In a commercial company, the "more" may be new revenue and market expansion. For a police agency, however, the "more" involves maintaining high levels of public safety and adapting to changing threats to public safety—a very different level of responsibility that quite literally has lives at stake.

Police agencies are tackling the "do more with less" realities by working strategically and focusing on several key areas:

- **Maximizing public services to citizens.** To maintain the highest-possible levels of citizen safety with limited resources and tremendous budget pressures, law enforcement agencies cannot simply add more patrol officers and more detectives. They must capitalize on the power of information to maximize utilization of resources. Giving officers and investigators direct access to real-time analytics can help them identify people, locations and vehicles that may be a threat to safety or critical to a case.
- **Enhancing officer safety.** To avoid placing officers in unnecessarily risky situations, police departments must ensure that they have the most updated, complete and reliable information about the suspects that they are dealing with. For example, knowing that a suspect has gang affiliations is critical when attempting to apprehend him or her.
- **Automating back-office operations.** Not everything that happens in a police department is visible to citizens; a significant amount of administrative and clerical work goes into supporting the agency. Automating some back-office functions can help increase efficiency and reduce costs.
- **Maintaining professional standards.** Public respect for the police department is vital to the agency's mission of protecting civic safety. Transparency and rapid access to information helps law enforcement agencies identify and address department members who engage in inappropriate behavior, corruption or illegal activities that violate the code of conduct.

- **Driving investigative efficiency.** As populations grow, so do crime rates—and police agencies cannot always keep pace. Heavy caseloads often force agencies to assign their limited number of analysts to major crimes only. As a result, detectives working on minor crimes do not have access to a full breadth of information. Implementing a comprehensive identity hub that considers all possible connections and relationships could help give all investigators the information they need to solve cases.

These five imperatives represent areas of potential savings and efficiency gains that will allow police departments to truly do more with their existing resources. However, realizing these strategic advantages requires the ability to access all potentially relevant information at the moment it is needed most. Speed is a critical factor in law enforcement, but a speedy response without accurate, complete information to back it up gives the officers, investigators and executives only a partial answer to their query—and may have potentially dangerous repercussions if citizen or officer safety is at risk.

How organizations forget: Enterprise amnesia

The information police agencies need to do their work is often scattered across multiple records management systems (RMS), legacy systems and databases—and these systems are not always integrated. Each repository is typically populated through its own distinct processes. Information is rarely shared—let alone matched—across systems. IBM Fellow and Chief Scientist of the IBM Entity Analytics Group Jeff Jonas calls this phenomenon "enterprise amnesia":

"When an organization misses the obvious (e.g., when other relevant information is trapped elsewhere in their organization) and then takes incorrect action, one might call this 'enterprise amnesia,' or simply forgetting what was known or should have been known."[1]

When investigating a person involved in a crime, it is imperative that law enforcement agencies understand the history and relevance of the person's past interactions. However, enterprise amnesia can prevent police agencies from connecting suspects and delay case resolution by making it difficult for them to answer key questions. For example:

- Is this witness a person of interest based on past interactions we had with them?
- Are any persons in my investigation related to any other persons of interest? If so, does that change their status?
- Is this person using multiple identities? Why? Are they lying to law enforcement officials?
- Is this person related to someone potentially dangerous?
- Are there events or things about this person that changes my opinion of them?
- Do any officers have a connection to the criminals that could indicate a code of conduct violation?

Beyond helping investigators answer specific questions about relationships among suspects in real time, a single trusted source of suspect information can also reveal new and relevant information. This discovery function is particularly critical when it comes to officer safety.

Consider this scenario: prior to pulling over a vehicle, a patrol officer makes a routine check of the license plate and learns there are no outstanding issues with the registered owner. The officer also learns that the plate is registered to a senior citizen but notices teenagers are driving the car. This fact may put the officer on alert—but without the benefit of information stored in a different database, the officer may not find out that the registered owner of the vehicle shares an address with two teenagers who are known gang members and were arrested last month for possession of an illegal firearm. With this additional knowledge, the officer has a more complete understanding of the situation and can exercise much more caution before stopping the vehicle.

Traditional solutions are not enough to cure enterprise amnesia

Manually searching and correlating information is slow and error-prone, but it can ultimately work because humans are able to decide whether disparate pieces of information are close enough to be connected. Still, this method is subjective; one person's opinion on the relevance of information will be different from another person's opinion. Trying to cure enterprise amnesia with manual correlation fails to achieve two key strategic imperatives for law enforcement agencies: automating back-office operations and improving investigative efficiency.

At first glance, it may seem that the easy answer is to integrate the information systems. In the previous example, that might mean integrating the gang member database with the motor vehicle database. However, officers still would not have in-context access to arrest records, warrants, traffic violations, contact reports or any other potentially useful information.

Simply integrating information systems isn't enough; police departments must be able to make sense of the information so officers can respond properly to situations that occur during an investigation. That requires an intelligent application of analytics and matching technology.

InfoSphere Identity Insight in action: Major North American police service

Like many law enforcement organizations, a prominent North American police department maintained multiple disparate and unconnected systems to house information regarding the activities of suspects, convicted felons, gangs and more. Investigators had to access each system separately and integrate information manually—a lengthy, labor-intensive process that took officers away from other tasks. In some cases, information in the source systems had been entered incorrectly or reported falsely by suspects, making it even more difficult for officers to correlate identities across systems.

The agency needed to simplify the process of finding and integrating information to create a trusted view of each person involved in an investigation. The ideal solution would also analyze data, resolve identities, enable officers to uncover new insights about the relationships among the information and provide leads that could help solve cases. With the IBM i2® Analyst's Notebook® and pre-integrated data from InfoSphere Identity Insight, officers can now perform deep investigations on any crime—no matter the size. Today, a single investigator can do in minutes what previously took numerous data clerks hours or days to complete. The system automatically resolves data every hour and currently processes an average of 7,000 new records per day, giving the department a 40 percent compression rate for identities in its data. Plus, investigators are uncovering relationships and linkages that were previously unknown: in one instance, they identified a new gang by using pre-integrated data from InfoSphere Identity Insight to quickly confirm and enhance information received in intelligence reports.

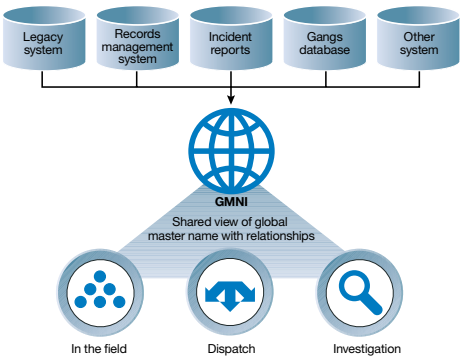

Figure 1. A GMNI helps police agencies gain a comprehensive understanding of identities and extended relationships that provides critical intelligence for officers and administrators across the departments.

Solve enterprise amnesia with a global master name index

Many records management systems use a master name index (MNI) to link persons among records. This index is unique to the RMS and is usually based on current data, not historical information. Furthermore, an MNI is often based only on names and birth dates and generally employs the Soundex algorithm, which may pose additional problems. While names and birth dates are the most common means of identifying someone, they are also one of the most inconsistent attributes when used alone. Relying on Soundex-based algorithms creates the potential for incorrect and possibly dangerous results by allowing too many non-matches or failing to uncover real-world connections among people.

An MNI also does not usually determine relationships among persons—and relationships are a valuable piece of information for law enforcement officials. In the case of officer safety, not knowing that a registered vehicle owner shares an address with (and therefore is likely related to) known gang members may put the officer at risk. Officers can make that connection—and adjust their actions accordingly—only if the department's systems go beyond name matches to look for relationships that are inherently known but not obviously exposed.

By taking the MNI concept a step further, a GMNI can help police agencies address enterprise amnesia by matching identities across systems and detecting relationships among them (see Figure 1). To generate maximum value for a law enforcement agency, a GMNI must perform two key functions that are not present in an MNI:

1. Discover and reconcile unique identities across systems

A single person may have slightly different records in multiple systems, such as an arrest record using a maiden name and old address, and a DMV record with a married name and both old and new addresses. The GMNI must make matches based on all available attributes, including historical ones, to determine which records actually belong to the same individual. Because different systems often capture different pieces of information about an individual, using multiple systems enhances the resolution process. For example, an arrest system may contain address and fingerprint information while a street-check system may contain only the address information. When these systems are processed in a GMNI, the street-check system is enhanced by the arrest systems' fingerprint data, leading to better and more frequent matches.

New identity records flow continually into police departments, so the GMNI also must reconcile new information with existing information as it becomes available—ideally in real time. By using existing contextual data to evaluate incoming information (and potentially revise older data), the GMNI can constantly improve the quality of the information available to the law enforcement agency.

2. Determine relationships among identities

The GMNI should support disclosed relationships (for example, when someone declares a relationship as a family member or emergency contact) and impersonal relationships (which may be implied when different individuals used common information, like an address, at some point in their history). The GMNI should be capable of calculating relationships to multiple degrees of separation, not just direct relationships. This intelligence helps to accelerate investigations by quickly and efficiently assembling the social network of a suspect based on what's known in the GMNI.

An effective GMNI helps law enforcement organizations achieve their key objectives in several ways:

- Giving field officers the necessary intelligence during policing activities helps *maximize public services to citizens and enhance officer safety*.
- Automating the correlation of identities and relationships in an investigative support solution helps to *automate back-office operations*.
- Including police agency staff in the GMNI can help *maintain professional standards* by identifying instances where an officer may be involved in a questionable activity and allowing officials to correct the problem before it escalates.
- Enabling officers to apply techniques normally reserved for high-profile crimes to minor ones helps *drive investigative efficiency* and helps agencies close cases more quickly.

Entity analytics in action: A state police department in the US

Widespread crime-prevention initiatives require police agencies to perform time-sensitive employment background checks, as well as search the background checks performed by federally registered firearms dealers. One US state police department wanted to improve the accuracy of the name search and name recognition capability available through the state's criminal justice information services.

By implementing IBM entity resolution solutions and unique IBM InfoSphere Global Name Management technology, the department improved true positive matches for individuals requiring further investigation by 8.4 percent and reduced false negatives by 78.1 percent, with a similar improvement in efficiency and reduction in administrative workload. In this manner, IBM provided a model of success that the department plans to extend to background checks for several firearms dealers in the state.

Build a GMNI with IBM InfoSphere Identity Insight

InfoSphere Identity Insight enables law enforcement agencies to build an effective GMNI that helps them meet their strategic objectives and overcome enterprise amnesia. Combining pioneering identity resolution and relationship disambiguation technology with innovative event-processing capabilities, InfoSphere Identity Insight provides vital context for information already in department systems as well as newly available data. By examining relevant individuals, their relationships and their actions, InfoSphere Identity Insight helps police departments create a complete picture of a person using a three-step process:

1. Who is who?

Once InfoSphere Identity Insight determines that two or more records belong to the same person, the software integrates the multiple records into a single entity and assigns a unique identifier. All of the data about the person or organization stays with this new identifier. The platform also identifies which source records provided the original information.

2. Who knows who?

The InfoSphere Identity Insight platform performs a thorough relationship network analysis. It uses the entity data generated during the previous step to learn whether people are, or ever have been, related in any way.

3. Who does what?

InfoSphere Identity Insight uses an advanced transaction analysis method called complex event processing to gain a clear picture of an entity's activity. The process is designed to mine the overall information landscape and reveal all of the associations and occurrences involving the same person or group. If it detects a pattern, the system proactively generates alerts.

InfoSphere Identity Insight in action: New York Police Department

To solve and prevent crimes more effectively, the country's largest police department recognized that it needed a more holistic way to provide information to a variety of users—from precinct detectives to crime analysts to department leadership. This approach would strengthen the department's ability to synthesize various bits of information into actionable intelligence.

Using IBM Cognos technology, the department implemented a Crime Information Warehouse (CIW) that provides a single, easy-to-use access point for data on virtually all crimes committed in New York's five boroughs. The CIW also serves as the information foundation for the NYPD's state-of-the-art Real Time Crime Center.

The Cognos business intelligence software, along with the identity and relationship detection capabilities offered by InfoSphere Identity Insight, helps officers and analysts in the Real Time Crime Center detect crime patterns as they form—enabling precinct commanders to take proactive measures and head off spikes in criminal activity. With the CIW in place, the NYPD has increased its case-closing rate through more efficient gathering and analysis of crime-related data. In addition, the department can now produce reports instantly that would have previously taken weeks or months to create.

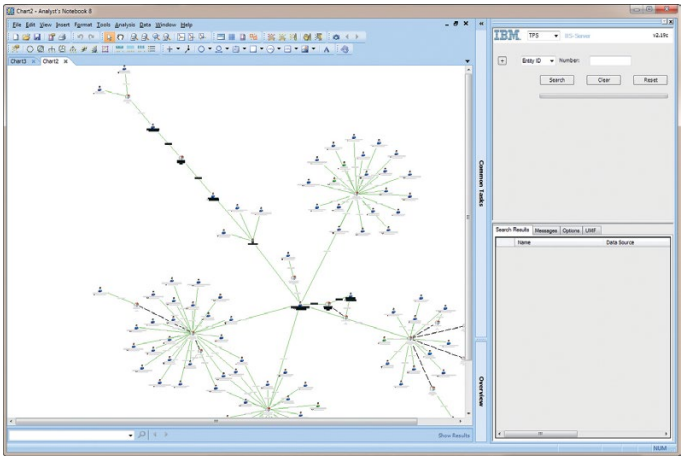

Figure 2. IBM i2 Analyst's Notebook provides graphical representations of connections and relationships between individual entities.

Streamline investigations with integrated, in-context information

A GMNI can play a critical role in helping law enforcement agencies streamline investigations. By implementing a GMNI that discovers and reconciles unique identities across siloed systems—and determines relationships among identities—agencies can treat the enterprise amnesia that hinders police work and slows progress toward strategic objectives. Agencies can ultimately deliver a higher level of services, enhance officer safety, automate back-office operations, maintain professional standards and improve operational efficiency.

InfoSphere Identity Insight integrates with other IBM tools that can help law enforcement agencies achieve their information-driven objectives. For example, IBM i2 Analyst's Notebook can help speed investigations by allowing officers to search for pre-calculated identity and relationship networks and import that data into the i2 Analyst's Notebook charts (see Figure 2). In addition, IBM Cognos® software provides a reporting solution to generate suspect and relationship profiles.

InfoSphere Identity Insight offers advanced capabilities to help agencies build an effective GMNI and provide context for the information it contains. Using InfoSphere Identity Insight to establish a GMNI, agencies can provide personnel with the insights they need to do more with less.

For more information

To learn more about the value of identity and relationship resolution in law enforcement and the capabilities of InfoSphere Identity Insight, please contact your IBM representative or IBM Business Partner, or visit:
ibm.com/id-en/marketplace/infosphere-identity-insight

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[1] Jonas, Jeff. "Enterprise Amnesia: Organizations Have Lost Their Minds." http://jeffjonas.typepad.com/jeff_jonas/2007/03/enterprise_amne.html

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