

Entity and relationship analytics solutions for public safety

Aggregate information from disparate data sources for efficient investigations, accurate intelligence and improved situational awareness



In this age of unrestricted personal mobility, law enforcement officials face an almost overwhelming data challenge: as huge amounts of potentially useful data pour into their systems, how can investigators collect and quickly collate relevant information relating to people, objects, locations and events of interest?

Even as officials try to organise data, their workloads continue to grow. Unresolved cases, the complexity of organised criminal activity, the obfuscation of criminal identities and relationships and the sheer number of data sources containing possible information about crime and criminals can be daunting. The scope of these activities and caseloads limits the ability of investigators to quickly identify the links and connections that help wrap up investigations.

Frequently, unresolved cases remain that way not because of a lack of data, but through the difficulty in gaining insight from data that is already at hand. Solving a case with too much data is often as difficult as trying to solve one with too little information. Officials need to identify not only how pieces of data fit together, but also recognise which ones are the most relevant. If investigators could discern those insights sooner, they could spend less time searching for information and more time doing what they're trained to do, analyse evidence and solve crimes. Like fingerprinting and deoxyribonucleic acid (DNA) testing, technology advancements that result in a strong data and analytics strategy help reduce the manual effort associated with searching for information in disparate data sources, which in turn can transform information into insights.

Engaging in holistic analyses for rapid results

Throughout the public sector, there is increasing financial pressure to do more with less and law enforcement is no exception. Yet citizens also demand results. How can the right data and analytics strategy help public safety agencies get better insight? The primary goal, of course, is to identify suspects quickly and build a case based on evidence. Bringing together that evidence no matter what format it is in, to analyse how it relates to suspects, the people with whom they associate, the places they frequent and the items they are connected to is crucial to building a case.

In short, an analytics strategy helps improve criminal identification and investigation procedures through holistic analyses. These analyses include up-to-the-minute identification of known offenders, persons of interest, victims and witnesses and how they are related, even if the information that links them is spread across multiple data sources. They can also include state-of-the-art methods for visualising these nonobvious relationships and can proactively alert investigators, analysts and field personnel when new information becomes available.

Strategising with law enforcement and public safety agencies

The IBM® InfoSphere platform includes a range of products to help law enforcement agencies craft these increasingly important data analytics strategies. IBM InfoSphere Identity Insight software is designed to provide real-time capabilities for identifying links between entities, using data from virtually any source. Unlike other approaches to deriving insights, which involve repeated manual or federated searches of data sources to find the proverbial 'needle in the haystack,' InfoSphere Identity Insight finds the non-obvious connections that can be identified only through deep analysis of resolved entity information.

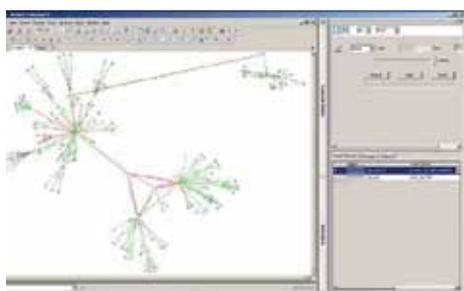


Figure 1: Identifying non-obvious relationships through graphical analyses using InfoSphere Identity Insight and i2 Analyst's Notebook.

The software can analyse even ostensibly weak relationships between victims, persons of interest and witnesses. Because it finds the nonobvious connections possible only through holistic entity resolution across disparate data sources (see Figure 1), the analysis provides insights difficult to achieve through human interpretation and manual matching. These insights are still difficult to detect when combining data sources, since the individual sources are often untrustworthy due to inconsistent data entry, data degradation and deliberate obfuscation.

InfoSphere Identity Insight leverages IBM Global Name Recognition approved under the Safety Act by the US Department of Homeland Security to analyse complex name variations resulting from different cultural and geographic origins. This analysis aids investigators who need to sift through potential spelling differences as well as non-intuitive connections between given names and nicknames (see Figure 2).

By performing these analytics in real time, accessing data from multiple sources and providing alerts when new information enters from any source system, InfoSphere Identity Insight helps create context and understanding for investigators, even when data may be limited, sparse or even misleading.

Another key tool available for law enforcement is IBM i2 Analyst's Notebook, a visual intelligence analysis environment that enables analysts to quickly work with resolved data from InfoSphere Identity Insight and imported data from other sources. With advanced visualisation capabilities delivered by i2 Analyst's Notebook, analysts and investigators can more easily identify key people, events, connections, patterns and trends in order to increase the understanding of the structure, hierarchy and method of operation of criminal networks. This enables timely and accurate operational decision making by simplifying the communication of complex data from disparate data sources.

The seamless integration of InfoSphere Identity Insight and i2 Analyst's Notebook further enhances the productivity, accuracy and completeness of investigative tasks by pre-calculating identity dossiers, relationships and complex event connections for instant, real-time visualisation and further analysis.

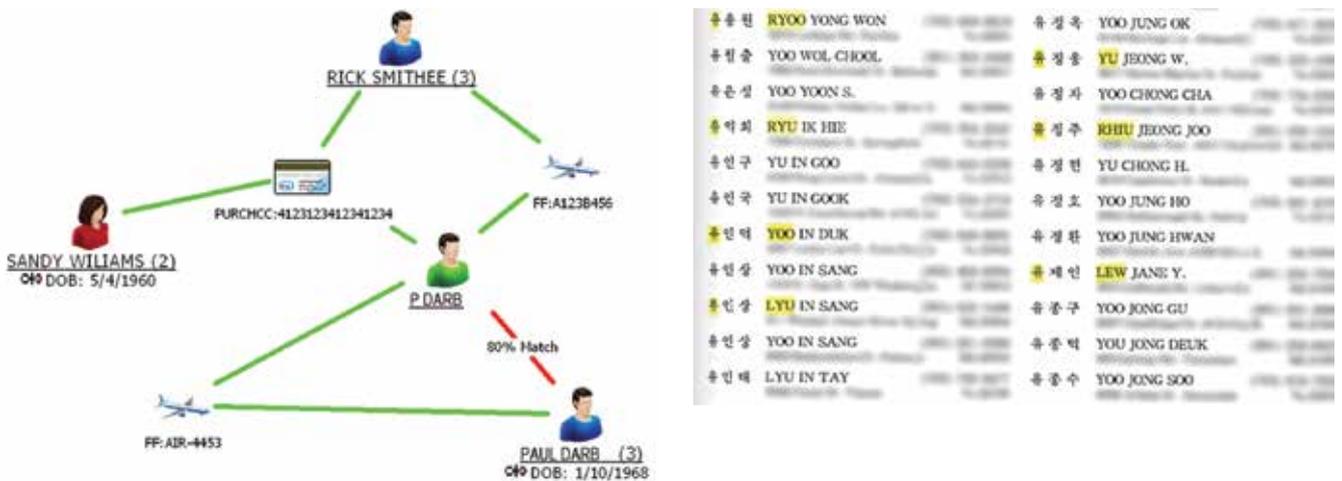


Figure 2: This example of a page from a Northern Virginia Korean-American phonebook highlights multiple surnames that are actually variant spellings of the same name, as evidenced by the common Korean characters in the left columns. Depending upon the culture, a name may have many properties (title, nicknames and so on) that can be automatically understood by an intelligent processing engine such as InfoSphere Global Name Recognition.

Elevating the efficiency of investigative techniques

Law enforcement agencies can derive multiple benefits from these advanced IBM tools, which are designed to:

- Reduce the need for investigators to perform numerous searches across multiple data sources
- Provide holistic views of entities by gathering all information in one place
- Pre-calculate the subtle connections between entities for immediate analysis
- Reduce the risk of missing event-or person-related information or relationships that may break a case
- Improve officer safety and situational awareness through alerts about events and relationships not typically available to them during routine queries and look-ups.

The system updates identities and relationships automatically and can send alerts to help ensure that investigators always have the most current information about a case. This process enhances investigators’ productivity, helping them quickly gain insights for resolving cases.

These tools also take advantage of application programming interfaces (APIs) to integrate many existing source systems and accommodate massive data volumes while still offering near-real-time performance. Plus, they use capabilities within InfoSphere Information Server to understand, cleanse, transform and deliver the data that produces high-performance analytics.

Investigative insights in action

Like many law enforcement organisations, a prominent North American police department maintained multiple, disparate and unconnected systems to house information regarding the activities of suspects, convicted felons, gangs and other individuals and organisations of interest. Investigators had to access each system separately and integrate information manually, a lengthy, labour-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 the correlation of identities across systems even more difficult for officers. 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 desired solution would also analyse data, resolve identities, enable officers to uncover new insights about the relationships among the information and provide leads that could help solve cases. Using IBM i2 Analyst's Notebook software and pre-integrated data from IBM InfoSphere Identity Insight, officers can now perform investigations on any crime of any size.

Today, a single investigator in the police department 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. At the same time, the system helps investigators uncover relationships and links that were previously unknown. For example, 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.

By establishing a holistic view of entities and relationships using InfoSphere Identity Insight and i2 Analyst's Notebook software, law enforcement and public safety agencies can help increase personnel efficiency, resolve cases quickly and reduce backlog.

In addition, this strategy facilitates the best result of all, a safer environment for law enforcement personnel and the community's citizens.

For more information

To learn more about IBM InfoSphere Identity Insight, i2 Analyst's Notebook and other IBM solutions that assist public safety organisations, please visit ibm.com/id-en/marketplace/infosphere-identity-insight



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