Predictive Policing, Business Intelligence and Criminal Analytics
When Will Your Agency Hire a Multi-Systems Analyst?

by

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The Command College Futures Study Project is a FUTURES study of a particular emerging issue of relevance to law enforcement. Its purpose is NOT to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This journal article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

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When Will Your Agency Hire a Multi-Systems Analyst?

Analytics in law enforcement has historically been synonymous with the crime analyst. The analyst compiled crime data for various reasons but ultimately for the prevention of future crime. As time has passed, crime data is primarily stored electronically and can be more easily analyzed and shared with other law enforcement agencies. Computer hardware and software systems are now being built for the purpose of both sharing and analyzing crime data in ways not easily identified by a human being. As law enforcement and their partners make dramatic improvement in crime analysis, private entities are using analytics for various other purposes.

Social media, such as Facebook and Twitter, routinely use analytic systems to track their users. This includes identifying users visually by using facial recognition software, tracking their likes and dislikes, and knowing their physical location. Companies such as Google, Yahoo and Amazon are using analytical systems to identify trends and track the buying habits of their customers. These systems are so robust they are now being touted as being able to predict housing markets and the fiscal stability of companies.

The course of this inevitable collision between private data and public need is for law enforcement to gain increased access to private data and analytic information directly from outside sources, mix it with their own information systems and use it to analyze and predict crime, identify criminals and ultimately prevent future crime. Could this drastic and ever increasing access to information create the need for a new position within law enforcement? Is it time for your agency to hire a Multi-Systems Analyst? Before getting too specific into what this person might do, let's first look at some of the current and burgeoning analytical systems that might come into play.

Predicting the Future

Predictive policing is a term that is a part of today's lexicon and certainly seems to be an important first step towards multi-system analytics. If you happened to tune in to the 2013 NFL

conference championship games you might have seen an IBM commercial touting their Smarter Analytics and the possibility of crime reduction by as much as 30% with the use of their software (YouTube, 2012). Or perhaps you read the January 2013 cover story of *Law Enforcement Technology*, Predict and Serve, and discovered that another company, PredPol, is also having success with their own analytic software (Garrett, 2013). No matter what system your agency decides on, your current crime analyst will certainly have their hands full trying to transition from pin maps to computer generated hot spots. But wait; maybe the cart has been placed before the horse. Prior to writing that check for predictive policing, you should be sure your agency could download your data quickly and efficiently into your records management system. Automated report writing and a records management systems that allow for police reports to be written, approved and entered in a timely manner will be crucial to any software system that will eventually analyze its data. You've got that in your agency? Fantastic! Are you sharing your data with all the other agencies in your region? How about the State?

Every good investigator knows that criminals don't only commit crime in one location. Analyst have shared information and helped each other with trends and crime sprees for many years. This sharing of information however has recently been improved and leading the way once again are companies like IBM and their Coplink system. This automated data sharing network groups data by geographical region, or "node." An agency participating in the program has searchable access that they can expand or contract to include any node in the Coplink network. The system can quickly identify trends, associates and patterns from incomplete and obscure information such as nicknames, partial plates, who might have been driving a specific vehicle during a traffic stop or who might have pawned a piece of jewelry. Coplink is currently working on adding social media information as a searchable field, but does not yet provide that capability. Bianca Ruiz, a crime analyst with the Roseville Police Department has been using Coplink for more than a year. When asked about its searchablilty she remarked, "Coplink helps put the pieces of the puzzle together in a way that our own records system can't" (B. Ruiz, personal communication, February 3, 2013).

While Coplink is a fantastic information sharing tool and has analytic qualities, it is slightly different from a predictive analytics system that uses your agency's specific information to identify where future crime might occur. While these systems are robust, unfortunately neither of them is currently accessing biometric data. To help address this need, 3VR, a technology company that deals in security software, video management, biometrics and loss prevention for retail business and financial institutions, created CrimeDex. 3VR describes their system as, "An online network leveraged by thousands of fraud, loss prevention, and law enforcement professionals collaborating to prevent fraud, shoplifting, Organized Retail Crime, and other white-collar crimes" (3VR, 2013). This collaboration between law enforcement and retail facilitates information sharing and incorporates 3VR technology to allow for uploading of photos and video for facial comparisons. CrimeDex is ideally suited to add to the ever-growing list of analytic systems that are sharing data with law enforcement.

Whether your agency has automated records management, predictive policing or regional data sharing at this moment, there is little doubt that many agencies are moving in this direction. Coplink is being used from shore to shore, including west coast nodes that range from Los Angeles and Orange County, through Sacramento and Modesto, all the way north to Oregon and Spokane, Washington. Predictive analytics systems are being utilized across the nation as well; from large departments like Los Angeles and Chicago Police to smaller locations such as Santa Cruz California and Shreveport Louisiana and almost anywhere in between. Finally CrimeDex's database is being accessed by thousands of law enforcement agencies, financial institutions, and retail fraud investigators nation wide.

Forensics and Social Media

Perhaps your first reaction to the idea of forensic analysis in law enforcement would be to associate it with the crime scene. Trace elements of bodily fluid, fibers and of course DNA are what usually come to mind. Nearly every television network has a prime time show about crime scene investigators solving crime through advanced, and many times mythical, advances in forensic analysis. What we are refereeing to, however, are the ever-increasing advances in

electronic forensics. In the past, many agencies banded together to create high tech task forces to help combat white collar or cyber crime because of the expertise and knowledge needed to extract forensic data from electronic devices. Today you will find that forensic analysis on cellular phones, computers, GPS equipment and surveillance systems are being conducted routinely at the individual agency level to help solve almost every type of crime possible. In some cases, agencies have dedicated detectives to the sole purpose of forensic analysis in the support of the other detectives within the unit.

Lieutenant Rick Collins of the Ceres CA Police Department said that approximately two years ago his agency went to this model. They have five detectives; two are responsible to conduct forensic analysis for the rest of their team. These two detectives carry a reduced caseload in order to give them adequate time to complete the needed analysis (R. Collins, personal communication, February 13, 2013). The Roseville Police Department uses a similar model, with two forensic detectives supporting five persons-crimes and five property-crimes detectives. These two forensic detectives are also an ancillary part of a larger regional effort called the Sacramento Valley High Tech Task Force. This grant funded task force has full time officers and deputies from numerous agencies throughout the region, as well as liaison representatives, like the Roseville Detectives. Sacramento County Sheriff's Lieutenant Mike McKeel, who is assigned full time to the task force, stated many agencies are beginning to identify and train specific personnel in computer forensics to deal with the ever-increasing need.

Another avenue for analytic follow up is social media. Law enforcement has for quite some time used the Internet and various social sites such as Facebook, MySpace and Twitter as investigative tools; searching for information, people and their associates. Basic Internet surfing sometimes leads to more in-depth inquiries with search warrants written for information contained on privately owned websites. Take that a step further and imagine if law enforcement could harness the analytical power contained within these sites. Let's take Facebook and their Tag Suggestions for example. Tag Suggestions is used when a person posts a photo on their Facebook page and then "tags" or labels a person in the photo with a name or moniker.

Facebook's facial recognition software will then identify that person and store the information. Later, when another photo containing the previously tagged person is posted, the software will recognize the person and will ask if the same name or moniker should be used again. If a law enforcement agency had access to a system that robust, they could take the photo of a wanted person and cross-reference it against every Facebook account in the world. The power of analytics on this scale could be staggering.

Odds and Ends

While we've touched on many of the big-ticket analytical items that could potentially occupy the time of a new employee, the list is by no means complete. A few of the odds and ends that are on the list of potential data streams include automated license plate reading (ALPR), biometric data from public and private sources, public surveillance systems, including traffic cameras and perhaps even data from federal agencies. Not every agency will have the ability or the desire to get information from all of these sources, but many will.

Biometrics for example, includes DNA, fingerprints, voice analysis, iris recognition and facial recognition. If your agency is located in a metropolitan area it is likely that there are businesses in your community that are already using biometric identification with their employees or customers. Could a security plan for that business include law enforcement access during critical or even routine situations? Or are these companies willing to partner with law systems like CrimeDex to upload their data for use by law enforcement and other retail and private fraud investigators?

Many cities and counties have taken advantage of federal dollars to install traffic cameras at the intersections within their jurisdiction. Most of these cameras are capturing buffered images of traffic accidents or even a bank robbery. If a city or county has invested in license plate reading software, consider the crime fighting possibilities associated with that software being installed in those same traffic cameras? It is beyond the term staggering, so let's try a new description; science fictional.

The Ideal Multi-Systems Analyst

With this ever-changing landscape, law enforcement is trying to keep up. One way to do so would be to recognize that we need employees who are educated and trained to handle this ever-increasing analytical workload. We need employees who are specialists. Without sounding pessimistic, let me ask if your agency has ever been guilty of assigning a task to a specific person, despite their rank, classification or assignment, solely because they were the only one who knew how to do it? Then after a while, that person gets another task, maybe related or similar in nature. Before you know it, that employee is working in one unit, supporting two others and is the only person who knows how, or why, a dozen different systems operate. Not to mention what happens when they want to go on vacation or retire. If you are not guilty of this, you are surely looking to your investigators, crime analysts, supervisors, patrol officers, administrative analysts, dispatchers, or command staff to take on these responsibilities. With so many different streams of data that are available to an agency, perhaps it's time to create a position that coordinates it all, the Multi-Systems Analyst.

Not all employees are created equal and what might fit in one agency might not be right for another. Some agencies place education as a premium, while others might see experience as their most important value. With that being said, let's look at this new position like a new car. If you had your way, what options, bells and whistles would you add? Let's start with education and look at what is being offered that could benefit us. There are many related fields that could prove to be useful; accounting, computer science, mathematics, economics, political science or criminal justice, but the one that seems to be surfacing as potentially a perfect fit is Management Information Systems (MIS).

If MIS graduates aren't knocking down your door, could law enforcement partner with the universities offering these programs to allow interns and placement of graduates? Santa Clara University describes the focus of their MIS program to be on, **"**The use of computer information systems and analytical decision-making methods in business organizations**"** (Santa Clara University, 2012). The use of the term business organization may give you pause, but the analytical systems being built for law enforcement are directly related to what the law

enforcement analytics industry calls business intelligence (BI). Information Builders, the supplier of law enforcement predictive analytics to agencies such as Houston (Texas) Police Department and Charlotte-Mecklenburg (North Carolina) Police Department, describe their BI systems as a way their clients can, "Transform historical, real-time, and predictive data into information and analytics that are consumable by all employees, managers, partners and customers" (Information Builders, 2012). IBM, arguably the leader in law enforcement analytics, states, "Traditional business intelligence (BI) capabilities are expanding beyond reporting, analyzing and creating dashboards and scorecards. BI practitioners must also plan and perform scenario modeling, real-time monitoring and predictive analytics." (IBM, 2013). If an agency downloads its data into an analytical system, the constructive way in which the information is produced and used is BI. What better educational foundation could a person have to oversee your agency's BI analytics program than someone with an MIS degree?

Having an education does not always prepare you for an occupation; so let's look next at what other training might help our new analyst. The traditional crime analyst and the certification programs that are designed for them would undoubtedly be helpful. Courses such as Sacramento State University's Crime and Intelligence Certification Program provide comprehensive analytical training, offered as part of a nine-class curriculum. At its conclusion, graduates are, "Designated as a Certified Crime and Intelligence Analyst for the State of California" (Sacramento State University, 2013). There are even courses that can be done completely online, such as Portland State University's Advanced Crime Analysis certification.

Training in the use of statewide systems such as California Law Enforcement Telecommunication System (CLETS) in California or NLETS for national access would be important for anyone tasked with an analytical position. Project management, dispatch training and the use of the forensic equipment might be important. Many agencies have chosen to embed an analyst in their investigations division in order to help detectives better communicate and avoid redundancy. Perhaps basic criminal investigation would be helpful. Other agencies chose to have their analyst be more of a support mechanism for patrol operations and personnel

distribution. Understanding radio code and the aforementioned dispatch training could be beneficial. Looking to the future, the Multi-System analyst could potentially be sitting in a traffic operations center, behind a fully functional dispatching style workstation, listening to radio communications and watching the full layout of their jurisdiction through surveillance cameras; watching and waiting to unleash the full power of multiple analytical systems at their fingertips. I can hardly wait.

Roadblocks

Even if you've bought into the concept and now you're ready to move forward, you know in the back of your mind that there are going to be a few roadblocks you will have to navigate. The primary roadblock to law enforcement obtaining personal data from non law enforcement sources is the issue of privacy. Privacy concerns related to technology are often associated with concerns that the government is violating the fourth amendment and obtaining your private information without due process. Associated with this is the concern that analytic programs are used to track information without the user being properly notified. Under what circumstances would the general public allow the government the right to access all of their private data? This issue is hotly debated and has already been addressed at various levels within the United States.

In October of 2011, the Chairman of the U.S. Senate Committee on Commerce, Science and Transportation, John D. Rockefeller IV sent Jon Leibowitz, the Chairman of the Federal Trade Commission, a letter supporting workshops to address his concerns, "On the privacy and security implications of facial recognition software" (Rockefeller IV, 2011). Many public and private companies use software programs to help identify people as they pass through a camera running the software. Senator Rockefeller addressed this by stating, "While there may be great potential for commercial, personal and law enforcement uses of this emerging technology, its development also raises numerous questions about individual privacy" (Rockefeller IV).

When discussing privacy, it seems the public might be less concerned if the privacy intrusion somehow benefits them, like having Facebook tag photos for you. Another example is allowing the government to conduct a background investigation in exchange for the convenience

of traveling without going through airport security checks. That is exactly what is now happening with Global Entry, a system being implemented by the United States Customs and Boarders Protection Agency (Global Entry, 2013). This type of voluntary check and release of information could have even wider analytical implications if this type of federal information was accessible by local law enforcement. Would convenience and or complacency lesson the concern for the violation of privacy? It's difficult to say if, or how, law enforcement's use of private data will continue to impact privacy concerns. In the 2012 Supreme Court ruling on the use of GPS tracking, Justice Alito provided a very insightful opinion on this subject,

> "Dramatic technology change may lead to periods in which popular expectations are in flux and may ultimately produce significant changes in popular attitudes. New technology may provide increased convenience or security at the expense of privacy, and many people may find the tradeoff worthwhile. And even if the public does not welcome the diminution of privacy that new technology entails, they may eventually reconcile themselves to this development as inevitable" (Supreme Court, 2012)

Another roadblock is cost. With the economy slowly recovering, the idea of business intelligence, predictive policing or multi-systems analytics might seem too futuristic. The Memphis Police Department however recently published specific monetary benefits of having an IBM Smart System. After a 2.5 percent increase in violent crime, they partnered with IBM to obtain an analytical system. A year later, they saw a decrease in crime and an increase in productivity. Their published benefits were: "863% return on investment, 2.3 month payback period, average annual benefit of $7,205,501 and annual cost of ownership $395,249" (IBM, 2011). They primarily based their cost analysis on a comparison between the percentages of crime reduction credited to their system, compared to what it would have cost to hire enough personnel to reach the same outcome. Indirect benefits included, "Improved communication with other law enforcement and government agencies…increased productivity… and increased overall visibility into crime activity" (IBM). The size and scope of this project is most likely much larger than what most law enforcement agencies would undertake. In 2012 the Salinas

Police Department made a more moderate request of their City Council when they asked for $75,000 for PredPol's analytic software (City of Salinas, 2012).

Many agencies look towards grants and other funding sources to help offset costs. Thirteen agencies from Sacramento, Yolo and Placer Counties created the Central Valley Information Sharing System (CVISS) and in 2009 worked with the Sacramento Regional Terrorism and Treat Assessment Center to obtain Department of Homeland Security grant funding to purchase access to the Coplink network. Placer County later offset maintenance costs by using California Department of Motor Vehicles' Remote Access Network (RAN) funds. This is but one example of how an entire region was able to obtain system access with very little departmental expense.

Staff costs specifically related to hiring or creating a new Multi-Systems Analyst could be of concern, and also be something that differs from agency to agency, depending on agency size, geographical region, and of course budget constraints. Agencies who have traditionally hired crime analysts, especially ones who require an undergraduate degree, could certainly use similar salary schedules. A quick Internet search for top-step crime analyst jobs in California range between $68,000 and $75,000 annually. This is not to say that your current analyst could not be trained and transformed into something new. Creativity, ingenuity and agency culture will be an important part of selecting what analytic system or systems your agency accesses, as well how you go about selecting, hiring and training your new Multi-Systems Analyst.

Worth the Trouble

Whether you want to call it predictive policing, smart analytics or business intelligence, the age of data analysis is upon us. Law enforcement agencies nation wide have turned roadblocks into speed bumps and are reducing their crime rates and making their communities safer with the help of these analytic systems. By providing training to your current analysts or by hiring new employees with the training and expertise needed to assimilate all the various analytic opportunities that are available now and in the future, the potential for increased safety

and the reduction of crime is increasingly feasible. As we move towards the future, it may well be a Multi-Systems Analyst guiding the way.

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