



Harnessing Statistics to Combat Crime

Predictive Analytics helps Memphis Police Department pinpoint crime and focus police resources

Overview

The Need

The Memphis Police Department saw an opportunity to better understand and fight criminal activity by mining the department's huge digital repository of crime records and police reports. By identifying crime patterns by time and location, the department would be able to pinpoint "hot spots" of activity and better deploy police details to deter crime.

The Solution

The department turned to IBM® SPSS® predictive analytics to chart and analyze crime patterns and develop effective strategies for reducing crime rates while optimizing police manpower and resources.

What Makes it Smarter

The MPD can analyze huge volumes of crime records in seconds, and revealing patterns of criminal activity and allowing more timely and targeted deployment of manpower and resources.

The Result

Since the data-driven Blue CRUSH program was launched in 2006, the city has seen a 27 percent reduction in serious (Part One) crimes.

When Larry Godwin took over as director of the Memphis Police Department in 2004, crime across the metro area was surging, and city leaders were growing impatient. "The mayor told me I want this crime problem fixed," recalls Godwin, a 38-year veteran of the MPD. But the new director understood that a business-as-usual approach to crime fighting would no longer be good enough.

"We were still doing things the way we'd always done them," Godwin says. "And when you do that, you can expect the same results." So early on in his tenure, Godwin convened a meeting of top law enforcement experts to formulate a fresh strategy to turn the tide in the city's crime war. Among the participants in this mini-summit was Dr. Richard Janikowski, a professor of Criminology at the University of Memphis who specialized in using predictive analytics to better understand patterns.

Janikowski proposed the idea of mining MPD's crime databanks to help zero in on where and when criminals were hitting hardest and then "focus police resources intelligently by putting them in the right place, on the right day, at the right time." By doing so, he said, "you'll either deter criminal activity or you're going to catch people." The idea made sense to Godwin and in short order the MPD and the University of Memphis – along with Project Safe Neighborhoods – teamed up in a pilot program that later became known as Operation Blue CRUSH, or Crime Reduction Utilizing Statistical History.

The data-driven pilot was wildly successful. During one two-hour operation, officers arrested more criminals than they normally apprehend over an entire weekend. But for Blue CRUSH to be successful on a citywide scale, the MPD would need to align its resources and operations to take full advantage of the power of predictive analytics. If done right, a city-wide rollout of Blue CRUSH had the potential to save money through efficient deployments – a big plus in a city facing serious budget pressures – even as the intelligence-based approach would help drive down overall crime rates.





Business Benefits

- Identified crime “hot spots” and focused police resources at these locations, helping lower crime rates by 27 percent over five years
 - Provided up-to-date crime statistics to officers on the street
 - Optimized police resources by avoiding inefficient overtime details
 - Improved reaction time to crimes by positioning officers at the right place, right time, on the right day
 - Enabled creation of color-coded maps to visualize crime patterns
 - Helped organized crime units and task forces develop plans for special actions and interventions
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Hitting the streets with predictive analytics

Knowing that predictive analytics would represent a cultural change for precincts accustomed to conventional crime-fighting strategies, Godwin was keen to involve the entire force in the transition. Says Godwin: “We involved officers throughout the process, communicated to them the ‘big picture’ of what we’re trying to achieve, and then showed them the results.” What’s more, commanders in each of the city’s nine police precincts were given extra resources to jumpstart the program along with the power determine how best to deploy officers based on the new intelligence.

As it turned out, precincts were eager to embrace Blue CRUSH – and predictive analytics has become one of the most potent weapons in MPD’s crime-fighting arsenal. At the heart of the system is a versatile statistical analysis tool – IBM SPSS Statistics – that enables officers to unlock the intelligence hidden in the department’s huge digital library of crime records and police reports going back nearly a decade. “The IBM solution has allowed us to take a new look and gain a totally different perspective on our data that we’ve always had,” says Jim Harvey, MPD’s deputy chief of administrative services.

Each day, the data repository is updated with new reports flowing in from the field, providing the MPD with near real-time crime analysis capabilities. Explains Harvey: “When an officer gets a call on a burglary, he goes out to the scene, takes his PDA into the house with him and takes the information down from the victim. When the report hits the system, the crime analyst immediately has access to it.”

Smarter Government: Leveraging predictive analytics to stay ahead of crime



Instrumented

Memphis Police utilize real-time digital crime data collected by officers carrying hand-held devices



Interconnected

Crime statistics are shared across precincts, task forces, and multiple government agencies, multiplying the value of intelligence assets



Intelligent

Armed with advanced intelligence on where and when crimes are likely to occur, precincts coordinate deployments to maximize impact on crime rates and optimize resources



Solution Components

Software

- IBM SPSS Statistics
- ESRI ArcGIS

IBM Business Partner

- ESRI
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– Larry Godwin, Director,
Memphis Police Department

Focusing on hot spots

The MPD routinely uses the software to uncover trends and pinpoint “hot spots” of criminal activity, taking advantage of IBM SPSS Statistics to slice and dice the data in virtually unlimited ways. To help officers visualize these hot spots, analysts feed SPSS data into a geographical information system from ESRI ArcGIS, creating color-coded maps that display crime patterns across the city in vivid detail. Because the analytics software is designed for easy integration with other applications and platforms, transferring data into ArcGIS is seamless (and painless), analysts say.

Data from the IBM SPSS system gives officers a big edge on the streets. Now precincts can focus patrols in neighborhoods and even street corners where extra manpower and resources are likely to pay off with arrests or deterrence. “On short notice, we’re able to shift officers to a particular ward, on a particular day, right down to the shift level,” says MPD Director Godwin. “It’s a bit like a chess match and [the IBM SPSS solution] is enabling us to make arrests we never could have before.” Data from the solution can also tell officers where to position surveillance cameras and when to monitor them to catch criminals in the act.

Safer streets

All indications are that Blue CRUSH and its intelligence-driven crime fighting techniques are putting a serious dent in Memphis area crime. Since the program was launched, the number of Part One crimes – a category of serious offenses including homicide, rape, aggravated assault, auto theft and larceny – has plummeted, dropping 27 percent from 2006 to 2010. Intelligent positioning of resources has been a major factor in the decline, helping to deter criminal activity by having more officers patrolling the right area at the right time on the right day.

More intelligent deployments also leads to faster reaction time, since officers are likely to be better positioned to respond to an unfolding crime. In addition, MPD’s organized crime units are using data from the predictive analytics solution to run special details that lead to successful multi-agency drug busts and other criminal roundups. Not surprisingly, arrest rates have been steadily improving across the Memphis area, which has a population of 680,000.

Accountability in focus

Among the other benefits of the information-intensive Blue Crush approach is better transparency and accountability. Precincts draw on the business analytics system to prepare “productivity sheets” that set specific law-enforcement goals and track performance from week to week, which helps keep teams on track. “The system tells us what our percentages are on all the different crimes in the city as a whole and shows each precinct commander where he is for that day,



where he is month-to-date, and where he is year-to-date as well as over the past five years.” These and other reports, Harvey says, enable precinct commanders to take responsibility for their crime-fighting performance and monitor the success of new strategies and tactics for curbing crime.

Today, the MPD is continuing to explore new ways to exploit statistical analysis in its crime-fighting mission. One area that holds promise is the use of the IBM SPSS Modeler application to help analysts rapidly search narrative accounts in crime reports and identify relevant records based on key words and phrases. The police department will continue to call on the University of Memphis for its expertise in how to exploit the latest techniques in predictive analytics.

Of course, predictive analytics and data mining is just one part of MPD’s overall strategy for keeping Memphis residents safe. Effective liaisons with community groups and businesses, strong partnerships with regional and federal law enforcement agencies, and intelligent organizational and operational structures all play a part in continuing MPD’s success story. “At the end of the day, everybody wants to reduce crime,” says Godwin. “Everybody wants a safe community because without it, you don’t have economic growth, you don’t have anything.”

About IBM Business Analytics

IBM Business Analytics software delivers complete, consistent and accurate information that decision-makers trust to improve business performance. A comprehensive portfolio of business intelligence, predictive analytics, financial performance and strategy management, and analytic applications provides clear, immediate and actionable insights into current performance and the ability to predict future outcomes. Combined with rich industry solutions, proven practices and professional services, organizations of every size can drive the highest productivity, confidently automate decisions and deliver better results.

As part of this portfolio, IBM SPSS Predictive Analytics software helps organizations predict future events and proactively act upon that insight to drive better business outcomes. Commercial, government and academic customers worldwide rely on IBM SPSS technology as a competitive advantage in attracting, retaining and growing customers, while reducing fraud and mitigating risk. By incorporating IBM SPSS software into their daily operations, organizations become predictive enterprises – able to direct and automate decisions to meet business goals and achieve measurable competitive advantage. For further information or to reach a representative visit www.ibm.com/spss.



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