

IBM Business Analytics for Crime Prediction and Prevention Demo

Overview

Like all government organizations, law enforcement agencies are faced with tighter budgets, yet must continue to improve public safety and respond to stronger calls for transparency and accountability in all policing actions. Under these pressures, the use of analytics to both respond to and ward off crime is more critical than ever. The answer is IBM Business Analytics Crime Prediction and Prevention.

IBM Business Analytics helps agencies capture data for analysis to contribute to an understanding of past events, as well as help predict future events. With this insight, agencies can take action to more effectively deploy resources and solve cases faster.

Let's take a look at how it works.

Meet Lieutenant Hobson, an officer with the Forley County police department. Hobson is a shift commander, responsible for determining patrol routes for officers in his assigned precincts.

Hobson relies on manual paper-based processes for much of his work. Information about incidents, individuals, tactics, and evidence comes from multiple sources and the crime information systems his office uses are old and provide limited reporting capabilities. Decision-making has been approached in a reactive sense, based on instinct and historical patterns.

Now meet Officer Davis, a patrol officer in charge of patrolling specific areas within the city, on alert for any signs of suspicious activity. Much like his colleague, Davis has faced the challenges of having to make decisions based on his gut instinct and ad-hoc data available from previous incidents.

Now let's take a look at how both officers can use analytics to improve operational performance and turn reactive thinking into proactive decision-making.

When Lieutenant Hobson starts his shift, he logs on to the reporting system to view a dashboard for shift commanders and patrol officers. There are no alerts but he does see that there is a concert being held in town that evening. Hobson quickly runs a what-if scenario to determine if factors such as it being a Wednesday, and the particular location of



1 CAPTURE 2 PREDICT 3 ACT

Analytics improve operational performance



Turn reactive thinking into proactive decision making

the concert, indicate an increased chance of an incident in his assigned zones.

The predictive model returns results positive for likely crime incidents, so Lieutenant Hobson radios Officer Davis to let him know additional coverage will be required in the zone where the public event is occurring. Using a mapping tool on the computer in his squad car, Davis then views the new patrol routes and alerts surrounding officers of the changes.

Back at the police department, Hobson continues his shift by tracking the outcomes of his decision-making using the dashboard. As results become available, Hobson can see if his deployment was a success or failure, and use this feedback to update the models for future incidents.

Now, let's take a closer look at the capabilities that enable the Forley County police department to improve service and help ensure public safety.

Capabilities

One of the core capabilities of the Crime Prediction and Prevention solution is advanced analytics, including predictive modeling, forecasting, and what-if scenario planning that can help determine the likelihood of incidents needing police attention.

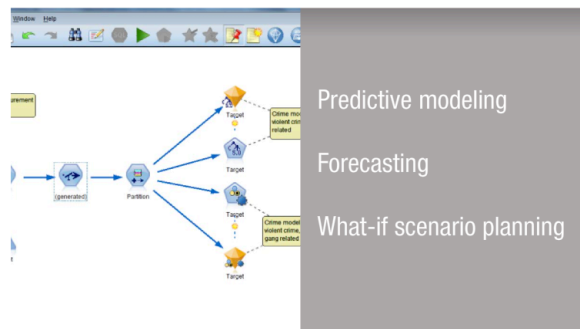
For example, Hobson and Davis can continually add information to a predictive model, revealing patterns and conclusions that may not otherwise be apparent.

Another capability is business intelligence. Access to real-time data enables officials to visualize predictive models and improve overall performance. Using dashboard capabilities, Hobson can monitor decisions made to determine whether the best possible outcomes are achieved. And further analysis of these reports provides deeper insight into underperforming areas of the department in need of corrective action.

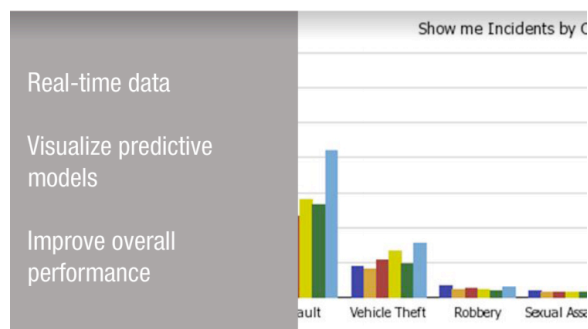
Financial performance and strategy management are also critical to crime insight. Planning tools allow the Forley County police department to measure budget and cost performance as well as analyze spending history, set goals, and build execution plans. These plans can then be used by Lieutenant Hobson to manage operations and deploy resources appropriately.



Advanced Analytics



Business Intelligence



Analytical Process

The foundation of the analytical process includes three basic steps: capture, predict, and act.

The first step—Capture—is to bring together multiple sources of data from historical crime incidents, available through the department's existing records management system. 'Enabling factors' such as weather and 'trigger' events, including holidays, events, and paydays are captured. In addition, unstructured data such as crime reports, surveillance videos, and call recordings can also be input into the data management system.

Once the data has been captured, Lieutenant Hobson can analyze the circumstances surrounding crimes and build models of these incidents. New data entered into these models is then scored and used to predict the likelihood of similar incidents.

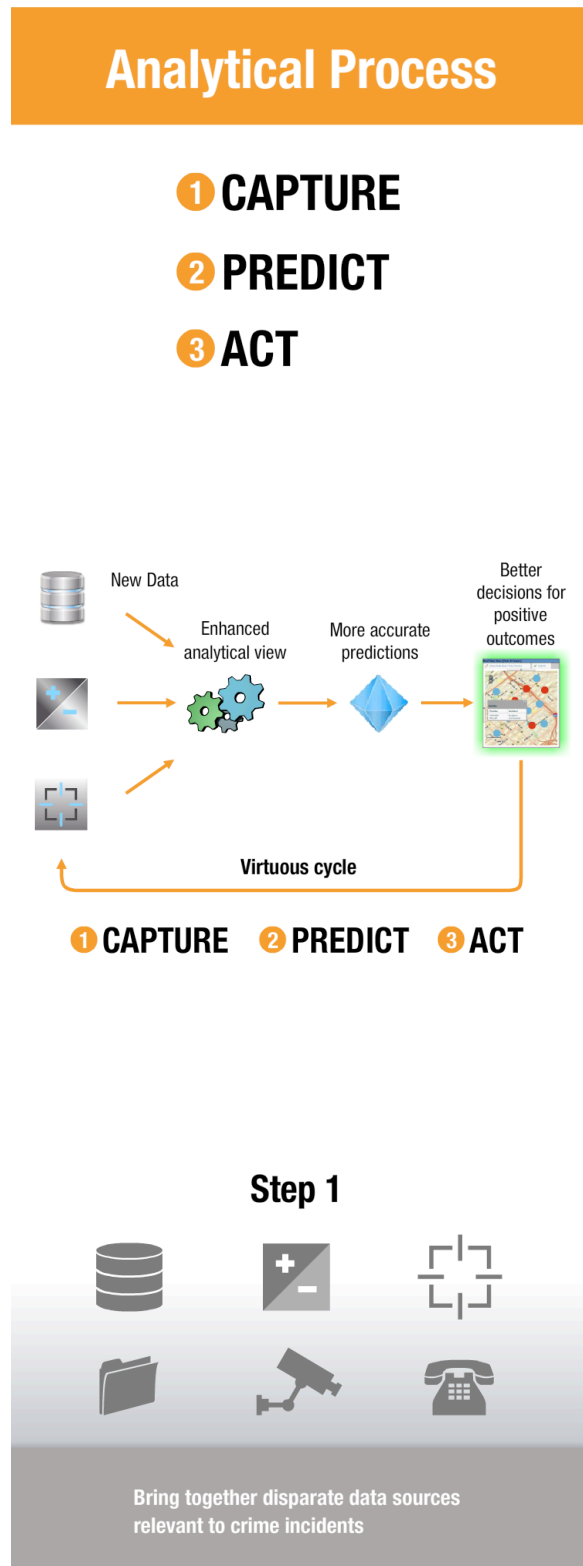
The final phase of the analytical process is to take action using the results of the predictive models. Hobson and Davis are able to see the results using GIS applications that display the locations of recent crimes and predictions of where they are likely to occur next.

The "Capture, Predict, Act" steps take the Forley County police department from collected data, through advanced analysis, to the successful deployment of analytical results aimed at improving public safety. This process becomes a "virtuous cycle," producing continuous improvement: new data is captured, enhancing the analytical data view, which then enables more accurate predictions to drive better decisions with a greater proportion of positive outcomes.

Journey

One of the most important aspects of the Crime Prediction and Prevention solution is its ease of use. So let's take a look at a summary of the simple step-by-step process that the Forley County police department used.

The first step was to bring together disparate data sources relevant to crime incidents such as weather, city events, local holidays, and surveillance video. This data is used to understand circumstances that may have contributed to past crimes, and could be factors



in future incidents.

The second step was to use the data to model criminal incidents and determine the exact circumstances characterizing the occurrence of crime – in order to predict the likelihood of future similar crimes.

Next, Lieutenant Hobson applied the crime prediction models to plan next-day activity and officer deployment.

Finally, the predictions were integrated into the agency's GIS application to display crime predictions, allowing Officer Davis to see up-to-the-minute data about high-risk areas in his dispatch zone.

Summary

Beyond what we've just seen, the Forley County police department can use the Crime Prediction and Prevention solution in other ways, such as cyber crime profiling and forensic analysis.

Public safety and security organizations can also use business analytics to prevent both internal and external terrorist threats and decide where to locate emergency command centers based on the frequency and location of crimes, fires, and accidents. Predictive modeling helps determine which criminals are most likely to commit another crime and need placement in more focused rehabilitation programs. In addition, agencies can benefit from using analytics for traffic-risk profiling, suspect vehicle identification, and asset maintenance.

So what results did the Forley County police department see?

- Lower operational costs from manual data collection from disparate systems
- Improved decision making
- More effective deployment of officers
- Increased public safety and citizen satisfaction

Real-time crime prediction and prevention capabilities are possible through IBM Business Analytics, offering user-friendly dashboards, reports, predictive modeling, and analysis, for real-time decision making.

With Crime Prediction and Prevention through IBM Business Analytics software, law enforcement agencies can better understand

Step 2

Risk Assessment

If Day = Wednesday
And Entertainment Event
And Day After Payday
And Dispatch Zone = 004
Then V_Crime = Yes (65, 0.98)



Model crime data to determine the exact circumstances characterizing the occurrence of crime – in order to predict future similar crimes.



Program and facilities management



- Lower IT and operational costs
- Improved decision-making
- More effective deployment of officers
- Increased public safety and citizen satisfaction



where and when crimes are likely to happen. They can make better decisions and more efficiently allocate and deploy resources to fight crime and increase public safety.

IBM Business Analytics software provides a complete view of historical performance, coupled with a predictive—and proactive—view of the future.

For more information, please visit us online.

IBM Business Analytics

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