IBM SPSS predictive analytics aids offender management

U.K. Ministry of Justice identifies hidden patterns in its data to better predict offender behavior

Overview

Organizational challenge

The U.K. Ministry of Justice needed a way to analyze vast amounts of crime and offender data to understand which proactive measures would be likely to prevent recidivism.

Solution

The ministry turned to IBM SPSS predictive analytics software – specifically IBM® SPSS® Statistics and IBM® SPSS® Modeler Premium, which analyzes both numeric and textural data – to analyze millions of prisoner files. The analysis is helping them develop treatment targets for prisoners throughout their sentence to reduce the probability they will commit crimes upon their release.

The Ministry of Justice is one of the largest government departments in the United Kingdom. Every year around nine million people use its service in 900 locations across the U.K., including scores of courts and tribunals, as well as 140 prisons throughout England and Wales. The Ministry of Justice works to protect the public and reduce recidivism, and to provide a more effective, transparent and responsive criminal justice system for victims and the public.

One of the most important objectives for the Ministry of Justice is to gain insight into offender data to identify hidden patterns and predict offender behavior. The principal risk assessment and management tool used by the National Offender Management Service is the Offender Assessment System (OASys). The data from all completed OASys assessments are collated centrally within the OASys Data Evaluation and Analysis Team (O-DEAT) database, which records information from over 4 million prisoner assessments. This includes data on individual offender circumstances such as accommodation, education, relationships, financial management and income, lifestyle and associates, drug and alcohol misuse, emotional well-being, behavior and attitudes. O-DEAT uses this data for the ongoing development of OASys, the provision of management information and various offender research projects.

Turning vast amounts of data into insights

Achieving the Ministry of Justice's ultimate goal to improve public safety requires accurate, timely and efficient analysis of vast amounts of data in order for the organization to be able to understand which proactive measures are likely to prevent recidivism.

Organizational benefits:

- Ability to perform a complex analysis of millions of files to reveal trends and patterns hidden within the data
- More accurate crime prediction rates: violent crime recidivism prediction improved from 68 to 74 percent, and general offenses recidivism prediction improved from 76 to 80 percent
- Development of more effective treatment targets for prisoners throughout their sentence
- Smarter government – a greater understanding of which interventions are likely to prevent recidivism contributes to the ultimate government objective of improving public safety

The ministry identified that merging OASys data with other types of data held in Ministry of Justice files would be essential in order to gain a clearer and more comprehensive view of the offender. The OASys system is used by approximately 140 prisons and 35 probation trusts and is the primary risk assessment and management tool. The Ministry of Justice sought to improve the validity of OASys as a predictor of recidivism.

Supporting offender managing processes

The Ministry of Justice turned to IBM to undertake complex analysis of large volumes of data from various sources to improve predictions about recidivism. The government department selected IBM SPSS Statistics and IBM SPSS Modeler Premium software for analyzing the millions of prisoner files. The analysis is helping the Ministry of Justice develop treatment targets for prisoners throughout their sentence to reduce the probability they will commit crimes upon their release. For example, the technology helps identify whether offenders with specific problems such as drug and alcohol misuse are more likely to reoffend than other prisoners.

As a result, both the OASys Violence Predictor and OASys General Reoffending Predictor have helped to substantially improve predictions about recidivism. In the case of violent crime, the prediction about recidivism has improved from 68 to 74 percent while the prediction about recidivism in terms of general offenses improved from 76 to 80 percent.

"IBM predictive analytics technology provides us with valuable insight into offender data which helps us to predict who may reoffend and enables us to advise on preventative measures before a prisoner's release date."

— Spokesperson for the Ministry of Justice

"With almost 4 million records on file, it simply wouldn't be feasible to trawl through this data manually in an attempt to identify those factors that may mean a prisoner is likely to reoffend," said a spokesperson for the Ministry of Justice. "IBM SPSS predictive analytics technology provides us with valuable insight into offender data which helps us to predict who may reoffend and enables us to advise on preventative measures, such as appropriate programs addressing offender behavior before a prisoner's release date."

Speeding up and simplifying data extraction

In addition, O-DEAT deals with ad hoc requests for data analysis and data provision, providing vital management information to policy colleagues and management, as well as to practitioners in the field. The Modeler data mining workbench has helped to speed up and simplify the process of data extraction and manipulation to meet such requests.

The way the Ministry of Justice is using the technology showcases the high-level capabilities of the software in providing analytical predictions upon which appropriate actions can be taken to reduce the danger to the general public. IBM is helping government bodies around the world to transform the way they operate by making smarter decisions for better outcomes.

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