

THE COMPUTERWORLD HONORS PROGRAM

CASE STUDY

LOCATION:
*New York City, New York,
United States*

YEAR:
2006

STATUS:
Laureate

CATEGORY:
*Government and
Non-Profit Organizations*

NOMINATING COMPANY:
IBM Corporation

ORGANIZATION:

New York City Police Department

PROJECT NAME:

Crime Data Warehouse

Summary

The Crime Data Warehouse was commissioned to be built in September 2003 as the result of the Solution Roadmap defined in August 2003. The Solution Roadmap called for enabling the automation of the CompStat Process in the first Phase of the Crime Data Warehouse and subsequently enabling crime analysis both from a historical perspective and Real Time in each of the 120 Commands throughout the city long term. The Phased Approach calls for multiple phases of development to incorporate up to 60 data sources into the CDW and to provide state of the art analytics to enable the field to perform their job more effectively. The ultimate goal was to put Crime Information in the hands of the officers on the beat as crime was occurring to increase their knowledge to protect themselves and the community, perform more efficiently, resolve crime occurrences more rapidly and to ultimately reduce crime overall.

Introductory Overview

The Crime Data Warehouse was built initially with 5 data sources that compose 80% of the data that is required to manage incidents and arrest from point of occurrence through the investigative process. In order to accomplish this task 2 databases were created, both an ODS (Operational Data Store, and the Crime Data Warehouse (CDW) to create the structure for Real Time and Historical trend crime analysis. Beyond the databases themselves, an OLTP database accessed by three Web Applications (DD5 Blue, Summons, and Shootings and Homicides) were created to enable an automated process of additional or new data capture to eliminate a number of manual processes that were the only mechanism to capture information beyond the point of occurrence at the time of CDW creation.

The Crime Data Warehouse went into production in March 2005 with Cognos Reporting with Integrated GIS (MapInfo) Mapping as the data access into the CDW.

As the CDW was being created, in February, 2004 Commissioner Kelly directed the creation of the Real Time Crime Center (RTCC), and charged it to help reduce crime by improving Investigatory and Crime Analysis effectiveness centrally and in the field. The RTCC comprises a new command initiated in March, 2004 under DI Beltran, and a complementary Technology



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Initiative under the leadership of DC Onalfo, CIO/Office of Technology and Systems Development (OTSD). The RTCC staff and technology is ultimately intended to serve and support the entire force, providing easy access to a revolutionary level of actionable information, and enabling continuous improvement of cross-command processes. The CDW served as the major portion of the foundation for the creation of the Crime Center.

Benefits

The following list details key technology-based capabilities developed and currently available to NYPD Detective and Patrol Bureau personnel as the results of the NYPD projects to create the CDW and subsequently the RTCC:

Crime Data Warehouse:

1. Automation for the variety of CompStat reports (18) that were previously produced manually requiring an average of 100 to 400 resources to produce on a weekly basis. These resources can be redeployed to more pertinent Crime Analysis functions rather than the duplicate entry of and assimilate of data for reporting purposes.
2. The publication of the CompStat Book to the NYPD intranet for access by the Department at large.
3. The "CRIME DATA WAREHOUSE" data marts (powerplay cubes) are made accessible independent of the transactional systems used to collect them. The Warehouse is leveraged as an important data source for a variety of NYPD users from the Chief of Department's Office, the Deputy Commissioner of Operations Office, the OMAP Office, the Pattern Identification Units in the Borough's, and is used directly by RTCC analysts as well. The marts contain data with very specific subject area focus, with a dimensional structure to allow for multidimensional analysis. The marts are typically used by end users for analysis in their respective area of expertise, or to explore leads in the context of an investigation. There are presently Sprint, Complaint, Arrest, Domestic Violence, Criminal Summons, Shootings & Homicides, Parole, Probation and Warrant marts available for inquiry within the CDW and the RTCC. Marts are updated immediately upon availability in the source, and links among incidents are created automatically in a subset of these marts.
4. Three Websphere Java Applications for the capture and/or adjustment of incident information not previously captured in an automated fashion in the Department. DD5 - Complaint Adjustment System, Summons - Data Entry of Criminal Mischief incidents throughout NYC, and Shootings & Homicide - Data Entry and adjustment of every shooting or homicide related incident within NY. These are real time data entry applications that feed directly to the ODS for near real time reporting purposes.
5. GIS mapping integration within the Cognos Query and Reporting tool set. This function allows the customer to map the result set of his query for visual inquiry of events throughout the city to enable clustering of events to better facilitate the deployment of resources within the city.

RTCC:

The RTCC was implemented as a complementary, prerequisite project by Data Dimension. The Center provides additional functionality as follows:



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1. Sprint 911 Calls For Service (CFS) – Each CFS record is collected in real time and is dynamically enriched with automated geographic coordinates, temporal and crime-type dimension categorization, and structured phone and person data extracted from the free-text message. CFS data are presented in varied Dashboard and Ticker formats, including Maps and Tables, layered by dimensional categories and combinations thereof. Metrics are provided to support resource management and supervision on many levels. These new facilities provide a uniquely useful flow of real-time crime activity, providing RTCC analysts and constituents the capability to monitor and be alerted to significant events in real time, and offering a foundation for management decision making regarding resources.

2. Modus Operand and Pattern Database / Application – This new facility helps analysts collect and analyze complaint reports for the purpose of isolating Modus Operandi and Victimology information, correlating the complaints with other incident and arrest records, and for tracking identified trends and patterns. This capability is a first for the NYPD. Previously, patterns were managed locally and were not automated or consistent. Patterns are now organized in a collaborative environment within and across precinct and borough boundaries, allowing citywide correlation and reviews. Historic pattern records have been captured and made accessible.

3. Public Information Database Access – The RTCC incorporates controlled access to external public information databases which link 32 billion discreet data records about 400 million persons. This new and powerful capability provides comprehensive aggregation of a wide range of public information about a person, plus a visual model of relationships among persons (suspects, perpetrators, victims, relatives, and associates), locations, and other associated information.

The Crime Data Warehouse can both allow access to and receive crime information from third party agencies like the FBI, Homeland Security Agencies, State Criminal Justice Agencies, etc. The richer the Crime Data Warehouse becomes with pertinent information the more useful it will become to policing agencies at large throughout the nation and perhaps beyond.

The Importance of Technology

Technology was the guts of this project. The Crime Data Warehouse and the RTCC development depends heavily upon the hardware and software that enables the crime analysis to occur. NYPD investigated upwards to 50 technologies to evaluation and chose only Crime Analysis enabling technologies as the result of this technology analysis structure. NYPD continues today to investigate new and emerging technologies to improve and evolve both the Crime Data Warehouse components and the “Center”.

Originality

1. A murder committed in 1988 was solved subsequent to the opening of the RTCC as the result of the analysis tools at the fingertips of the detectives in the Center.

2. A kidnapped 6 year girl was recovered in under six hours as the results of the data available in the CDW and RTCC environments that allowed linking events to lead to the perpetrator of the crime.



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The NYPD Real Time Crime Center is the “first of its kind” in the United States and perhaps the world. The framework established at NYPD can be copied and deployed to other jurisdictions seeking to utilize technology similarly to the way NYC is using technology. The design and development of new centers can leverage this framework to reduce the timeline to completion and the overall cost of such an engagement.

Success

See Originality section.

They have embraced it within weeks of its opening. In fact, NYPD, has received numerous requests to visit and discuss the technologies it has deployed from other Policing Jurisdictions as the result of the opening of the RTCC in July 2005.

Difficulty

Budgetary limitations within the Public Sector, the acquisition of the right types of technologies to perform most effectively in the Criminal Justice environment, the right mix of technology experts to deliver the solutions, Organizational confidence in the usefulness and ease of use of the technologies.

Funding in every governmental organization is always a challenge. Executive buy in and recognition of the goal from both Mayor Bloomberg and Commissioner Kelly were instrumental in overcoming the funding obstacles that were encountered and in building the case for the funding at its inception.