Smarter Solutions for Smarter Cities:

Public Safety Case Study

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What is the IBM Buffalo Innovation Center (IBIC)?

**Collaboration between IBM, SUNY Polytechnic and its Private and Public Partners**

- 500 high-tech jobs committed by IBM within a 7 year period
- Located at the Key Center, at 40 Fountain Plaza in downtown Buffalo, 12th floor
- Permanent home will be the top 6 floors of the south tower; the 3rd floor for the data center (total 7 floors)

Design point is as an analytics center

- Focus on **Advanced Analytics, Big Data, Watson (Cognitive) Computing**
- Represent the entirety of IBM for client solutions (SWG, GBS, AMS, Research, STG)
- Primary industry focus in Government and Healthcare; Secondary cross-industry within New York State

Develop integral relationships with local colleges and universities

- Help design and implement an analytics curriculum
- Develop a recruiting process
- Implement internship and residency programs
- Focus on local colleges and universities (UB, Buf State, Canisus, ECC, etc) as well as regional schools (RIT, RPI, Syracuse, Cornell)

THE BUFFALO NEWS
IBM to bring 500 new jobs to Buffalo
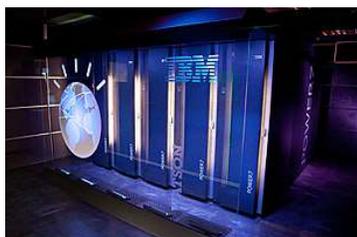
Cities require smarter solutions

- The systems are under increasing environmental, social and economic pressures
- For sustainable prosperity, the systems need to be managed optimally
- The systems need to become smarter!

Not more…

...but SMARTER!

'Smart' solutions are instrumented, interconnected and intelligent

Instrumented + **Interconnected** + **Intelligent**

Event capture and filtering for timely response

Any to any linkage of people, process, and systems

Deep discovery, analysis and forecasting
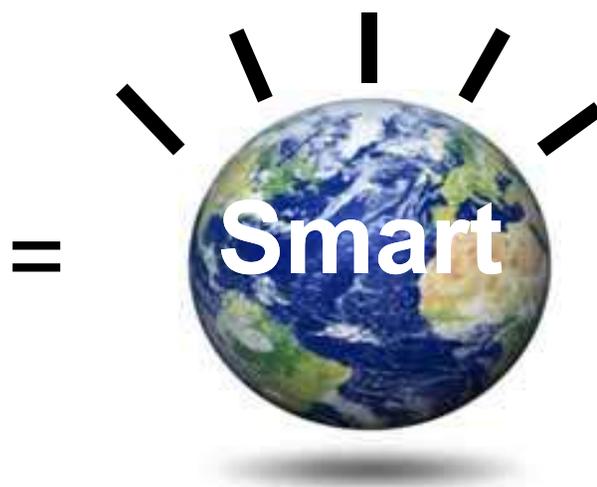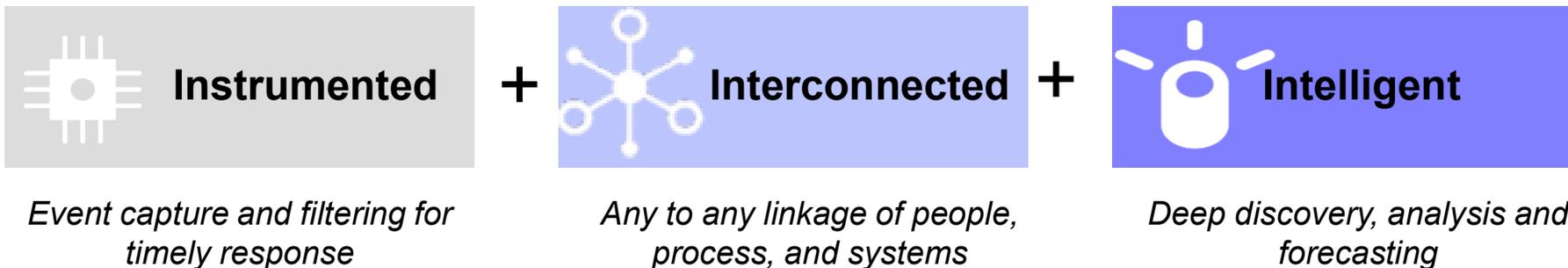
= **Smart**

Each core system can be made 'smarter'

System	Elements
City services	▪ Public service management ▪ Local government administration
People	▪ Health and education ▪ Public safety ▪ Government services
Business	▪ Business environment ▪ Administrative burdens
Transport	▪ Cars, roads ▪ Public transport ▪ Airports, seaports
Communication	▪ Broadband, wireless ▪ Phones, computers
Water	▪ Sanitation ▪ Freshwater supplies ▪ Seawater
Energy	▪ Oil, gas ▪ Renewable ▪ Nuclear

Instrumentation	Interconnection	Intelligence
Establishment of local authority management information system	Interconnected service delivery	Immediate and joined-up service provision
Patient diagnostic and screening devices	Interconnect records for doctors, hospitals and other health providers	Patient driven pre-emptive care
Data gathering on use of specific online business services	Interconnect stakeholders across city's business system	Customised service delivery for businesses
Measuring traffic flows and toll use	Integrated traffic, weather and traveller information services	Real-time road pricing
Data gathering via mobile phones	Interconnect mobile phones, fixed line, broadband	Information for consumers on city services in real time, on their own time
Gather data for water quality monitoring	Interconnect businesses, ports, energy users of water	Real-time quality, flood and drought response
Fit sensors to gather data on usage across the energy system	Interconnect appliances and devices between energy consumers and providers	Optimise the use of the system and balance use across time

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Instrumented **+** **Interconnected** **+** **Intelligent**

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Case Study based on Mega City Police Departments

NYC
Tokyo
Toronto

Pipo-kun

	NYPD	Tokyo MPD
Established	1845	1874
Geography	5 boroughs of NYC	Tokyo Metropolis
Population	8.3 million	13 million
Sworn officers	35,000	43,000
Civilians	5,000	2,800
Stations	76 Precincts, 12 Transit Districts, 9 Housing Units	101 stations 253 substations 831 kobans
Officers per 100K	420	330

The New York Police Department Serves 8 million NYC Residents + Commuters + Tourists

Average Per Year:

10 million 911 calls

830,000 Complaints

350,000 arrests

200,000 cases requiring investigation

54,000 NYPD personnel

4,500 NYPD detectives

46 RTCC Personnel

License Plate Readers

Video Surveillance Cameras

Body Worn Cameras

Complaint Volume by Year

CMPLNT_KEY

— Complaints

CMPLNT_YR_NUM

(Line chart: x-axis years 1996–2006, y-axis 0 to 1,000,000. Complaints declining from ~960,000 in 1996 to ~730,000 in 2006.)
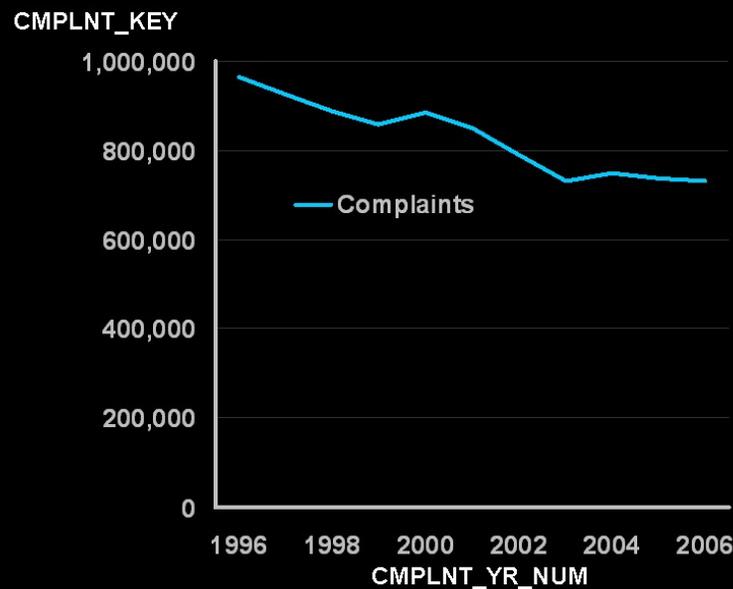
NYPD faced a number of challenges before RTCC

External Factors

- Continued pressure to improve public safety (7 major crimes)

- Continued threat of terrorism

- Budget restrictions to do more with less

- Need to share criminal justice data with local, state, and federal agencies

Internal Factors

- 100 + NYPD and External computer systems
  - Every check = log into another system

- 120 million criminal complaint, arrest and 911 records

- Patterns, case management paper-based

- How do you connect the dots? By index cards and easels

Information was locked-up better than the criminals

The NYPD Real Time Crime Center

A state of the art, 24 hour operation, designed to track analyze and respond to emerging crime trends, provide investigative support, and facilitate the effective deployment of resources

"The Real Time Crime Center, which first opened in July 2005, conducts rapid analysis of homicides and shootings citywide in order to provide a real-time assessment of emerging crime, crime patterns and potential criminal suspects citywide."

Mayor Bloomberg and Police Commissioner Ray Kelly announce the expansion of the NYPD's Real Time Crime Center. The expansion will enhance the Center's resources to include serious crimes other than murders and shootings.

Watch the video in 56k or 300k
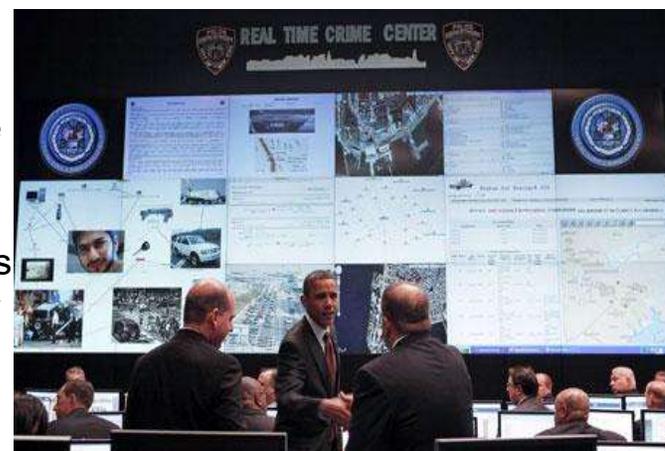
Crime Information Warehouse Supports
Two key functions within the Police Department

CompStat Book

Crime Analysis

Historical Trending

UCR, NIBRS

Statistical

Information

Investigative

Situational Awareness

Crime Pattern Analysis

People/Location/Phone Searches

Link Analysis

Watch list Alert/Subscription
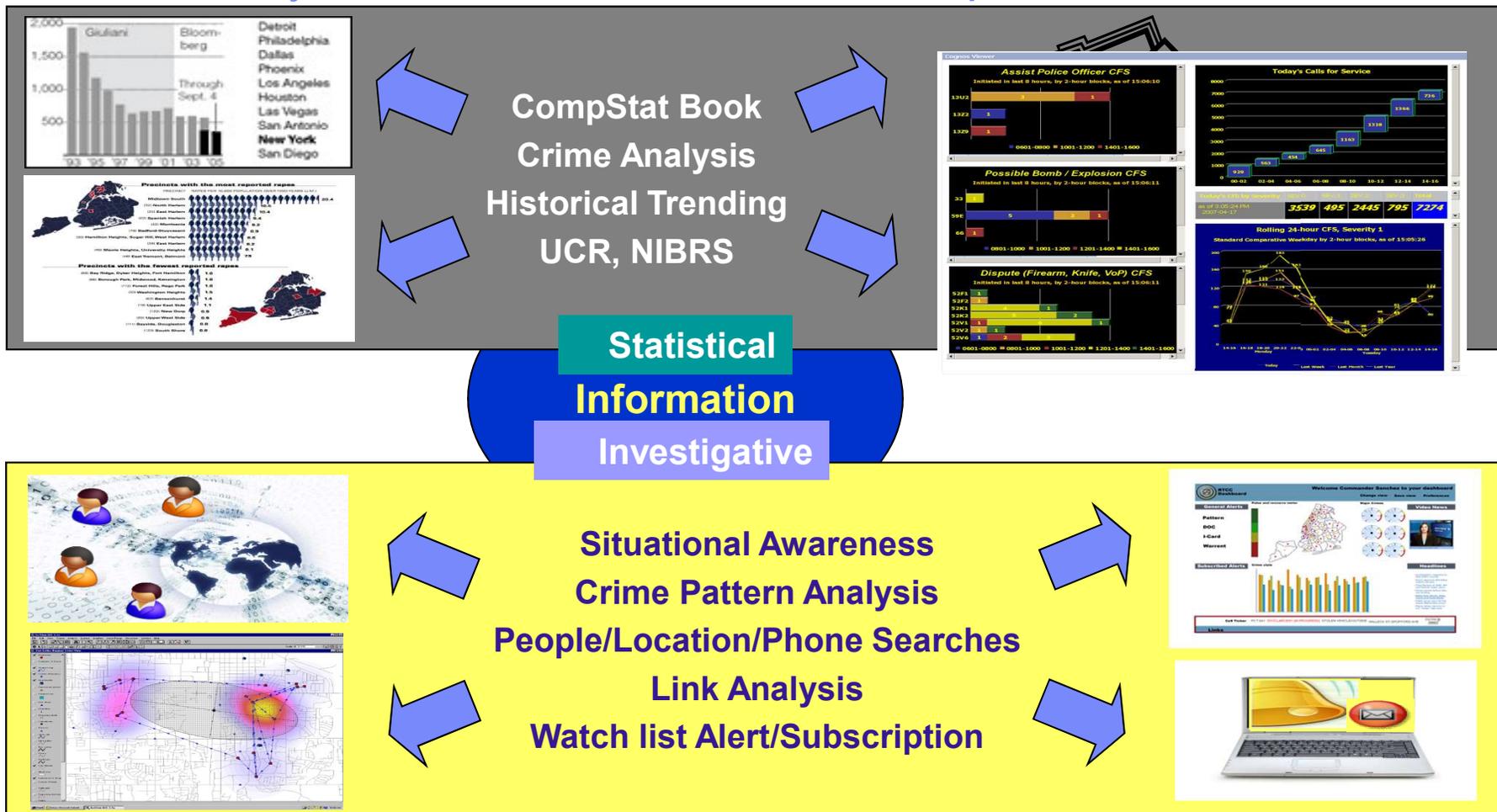
Crime Analytics
CIW - CompStat

- CompStat is NYPD's crime statistics and management accountability process.

- It is a management continuous improvement process

- CompStat metrics focus on the 7 major crime (e.g. murder, rape, robbery, larceny) trends on a weekly basis at the precinct level.

- Precinct commanders must answer to their chiefs on a weekly basis

- Nearly every major police agency in the US and some outside the US have adopted CompStat and need a better way to monitor the success of the process
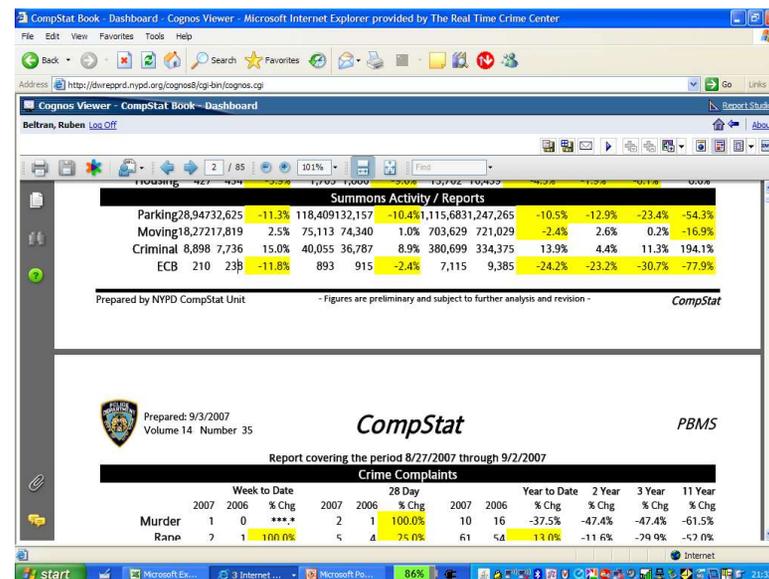
Too much information can be as bad as too little information

Insight

Identify Resolution
Data Reduction

Visualization
Dashboards

Data Repositories

Time, Data, Information
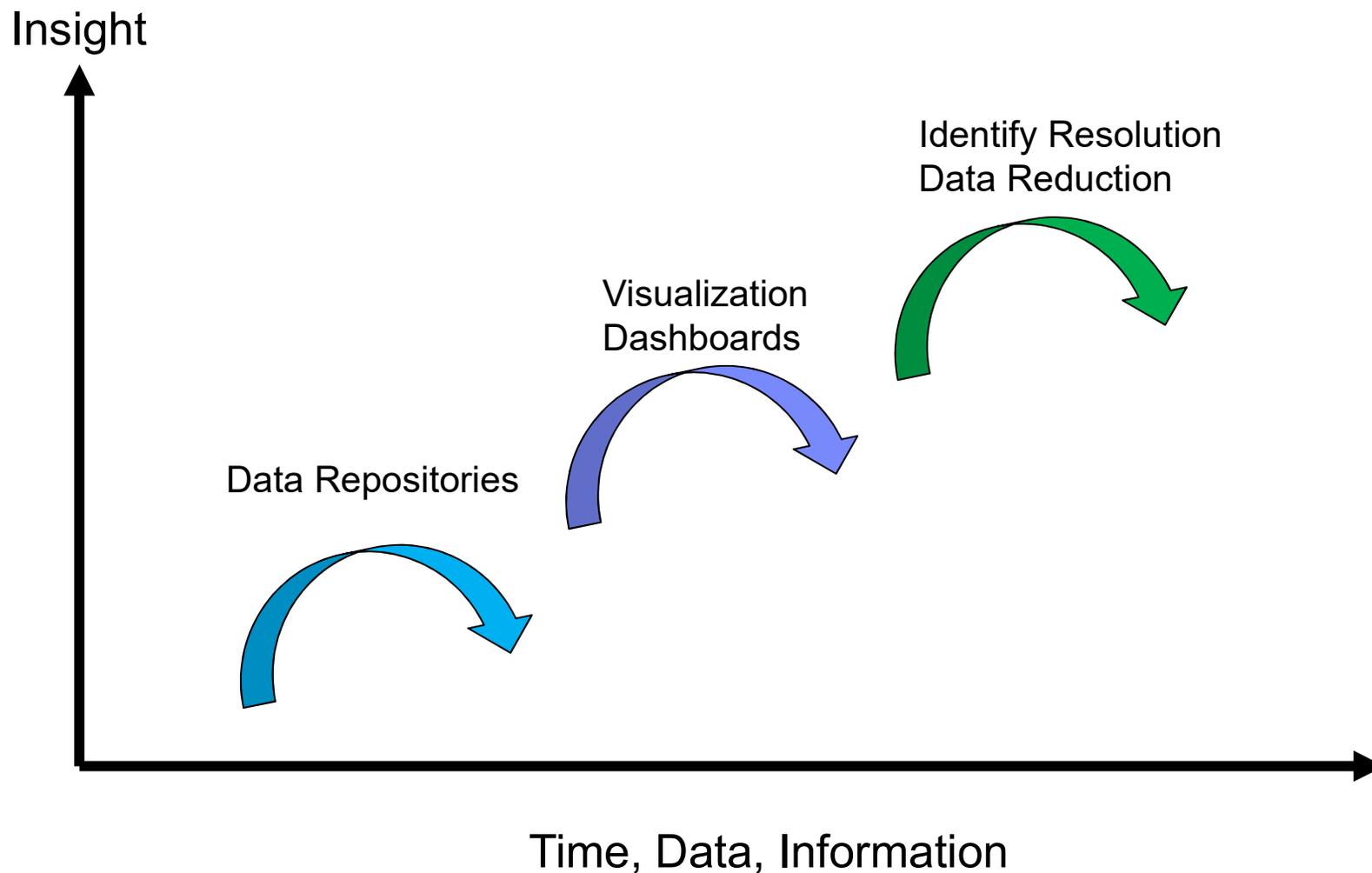
Large collection of data sources create unique information management, search and quality challenges. **Identity Resolution** is an analytic technique for establishing

- who's who?
- who knows who?
- who does what?
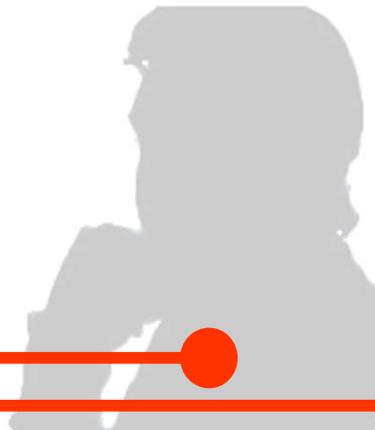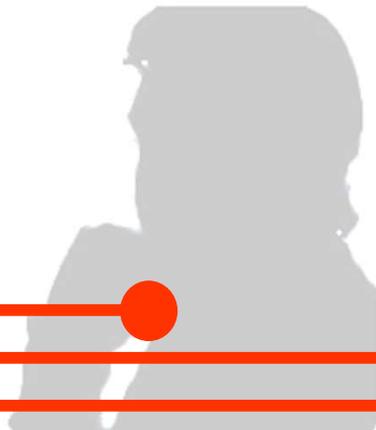
Jim T. Evans
Address: 25 Oak St
Location
-Brisbane
Lic#:220-346739-009
DOB: 06/07/72
Violation:
- DUI

Evan James
Address: P.O. Box 452
Location
-Hamiliton
Lic#:234-356739-678
DOB: 06/07/72
Violation:
- Disorderly Conduct

Jamie Avens
Address: 16 Clark
Location
-Ithaca
Lic#: 234-356739-678
DOB: 06/07/73
Violation:
- DUI

Thomas J. Evans
Address: 25 Oak St
Location
-Brisbane
Lic#:220-346739-009
DOB: 07/06/73
Violation:
- Murder Suspect

Crime Analytics

NYPD has started to use identity resolution to get a single view of "perps" along with their associates…

Before view of Mr. X
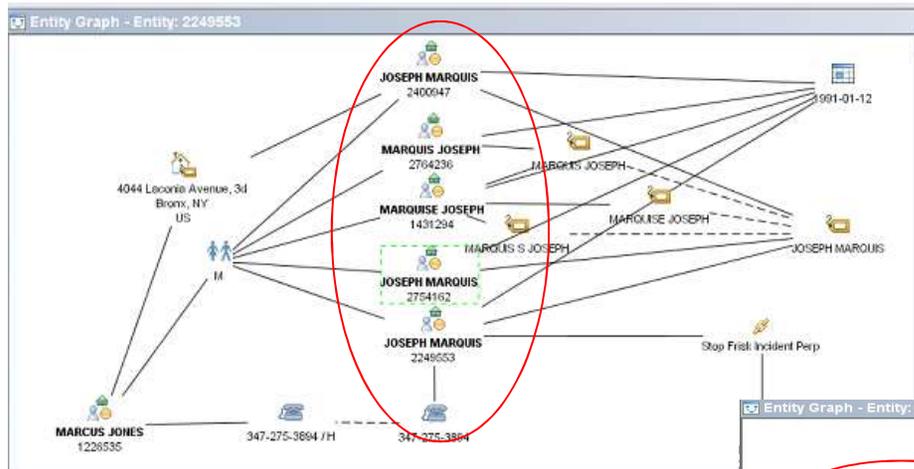
After resolved view
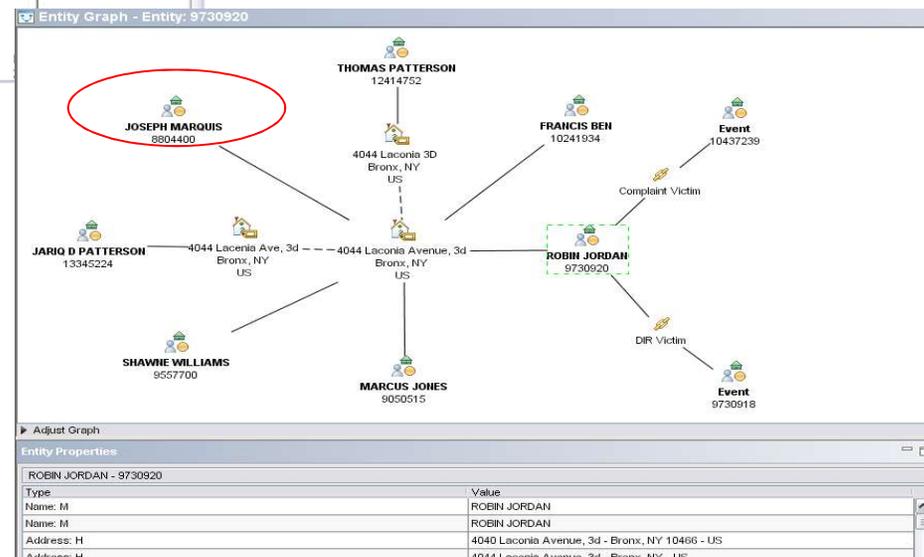
Lessons Learned from the field
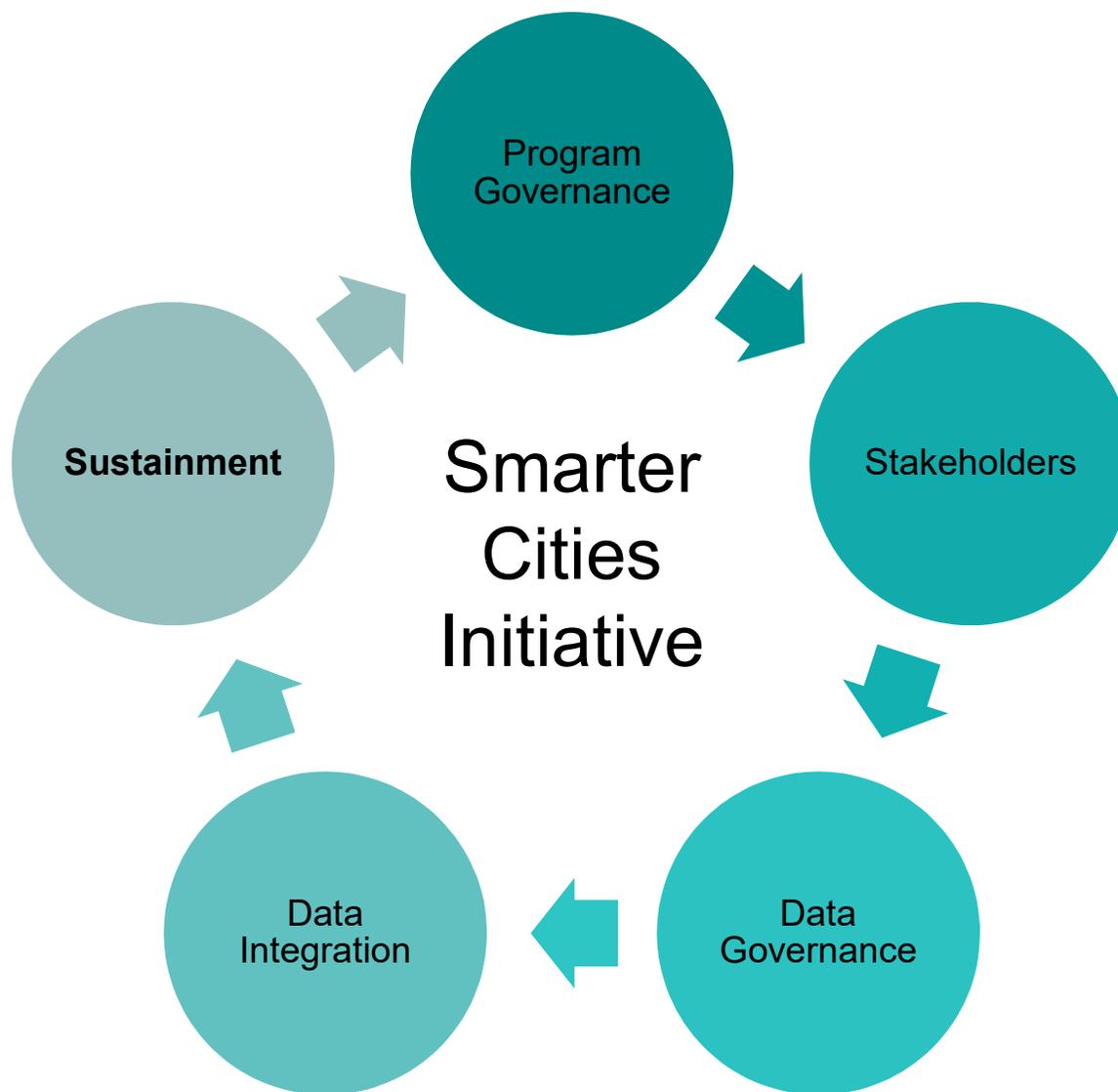
Questions and Answers

धन्यवाद
Hindi
Hindi

多謝
Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

ありがとうございました
Japanese

Obrigado
Brazilian Portuguese

شكراً
Arabic

Thank You
English

Danke
German

Merci
French

Grazie
Italian

நன்றி
Tamil
Tamil

감사합니다
Korean

Terima Kasih
Malay / Indonesian