



From Compstat to Gov 2.0 Big Data in New York City Management Teaching Note

Case Summary

“Big data” analysis, which involves applying statistical techniques to massive amounts of information from a variety of sources, has seen widespread adoption in the private sector, from tech enterprises to retail, as companies seek to uncover new insights about consumers. Early in the 21st century in New York City, Mayor Michael Bloomberg, who as CEO of Bloomberg LP had made a fortune in financial data services, sought to adapt big data analytics to public management.

New York was in many ways an ideal place to conduct such an experiment. “The city knew a tremendous amount of information about locations and businesses and people in New York City,” according to Michael Flowers, appointed by Bloomberg as the city’s first---ever chief analytics officer.¹ Flowers was charged with using that information to find novel patterns and solutions to problems. Some 40 city agencies collected a variety of statistics about the daily life of the city’s 8 million inhabitants; among other things, the city knew how many cars parked next to a given meter every day, how many noise complaints occurred in each neighborhood, and which ZIP code consumed the most electricity.²

Not only was a wide variety of information available in New York, the city had a template for how to use it in public management: the New York City Police Department’s Compstat (“computerized comparison crime statistics”) system, adopted in the early 1990s. Then---Police Commissioner William J. Bratton had developed Compstat as a tool to help combat the city’s skyrocketing crime, reasoning that the NYPD should concentrate its officers where the crime rate was highest in an effort to prevent rather than just react to crime. Compstat helped the department allocate scarce resources to where they could have the greatest impact by making sure officers had up---to---date information about where crime was

¹ Adam Stepan’s interview with Michael Flowers on February 26, 2014, at Columbia University. All further quotes from Flowers, unless otherwise attributed, are from this interview.

² Alan Feuer, “The Mayor’s Geek Squad,” *New York Times Magazine*, March 23, 2013. See: <http://www.nytimes.com/2013/03/24/nyregion/mayor-bloombergs-geek-squad.html?pagewanted=all& r=0>

occurring—a revolution for a department accustomed to reporting crime statistics four months after the fact.

This case exposes students to the application of big data analysis in public management through three distinct agencies in New York City. The first section traces the development and implementation of Compstat in the NYPD, and in particular the early challenges of reorienting an agency of several thousand from reactive law enforcement to proactive crime prevention through rapid reaction to daily shifts in crime patterns. The second section details the implementation of a similar system in the New York City Fire Department's Bureau of Fire Prevention nearly two decades later as part of an effort to prevent fires. Finally, the third section examines Mayor Bloomberg's attempts to expand the use of data analytics citywide, especially through the Mayor's Office of Data Analytics under Flowers.

Through the case study, students will step into the position of key decision makers at these city agencies and consider the best methods for discovering problems and allocating limited resources to solve them. They will see in detail the potential and the limitations of big data analytics in a variety of public management contexts, and learn about the challenges of implementing new techniques within long-established bureaucracies.

The case ends as the Bloomberg administration draws to a close in late 2013. By this point, a number of city agencies have adopted data-driven management techniques reminiscent of Compstat. But the innovations have principally come at the agency level, rather than top-down from the mayor's office, meaning a proliferation of new data management systems among the city's 40 departments, from the Parks Department's ParkStat to the Fire Department's Risk-Based Inspection System. The spread of such techniques appears to improve the ability of each agency to do its narrowly defined job, but does not necessarily facilitate coordination among city agencies and may in fact strengthen existing bureaucratic silos. The central statistical body that does exist, the Mayor's Office of Data Analytics, is not guaranteed to survive the change to a new mayoral administration. Students are left to wrestle with the question of how, or even whether, to push New York City's data revolution forward.

Teaching Objectives

Use this case to prompt discussion about how public managers should define their goals. Prior to the development of Compstat, police officers rated their performance according to measures such as the length of time it took officers to respond to 911 calls. Bratton argued instead that the crime rate was the most important measure of how the police department was performing. By what metrics should public servants be evaluated? How can public managers determine the quality of their performance? How, if at all, should public opinion be taken into account?

Once a public manager defines a set of goals, he or she must then determine how best to allocate limited resources to achieve those objectives. Ask students to evaluate the strengths and weaknesses of different methods for deciding where to focus resources. Prior to 2010, for example, the Fire Department relied to a large degree on intuition in determining where to send inspectors, while the Bloomberg administration was known for emphasizing data-driven decision making on the premise that "if you can't measure it, you can't manage it." Are there

alternative methods between intuition and sophisticated data analytics that public managers should consider? What are the advantages and drawbacks to each approach? What role, if any, should intuition play in public management? Would it be ideal to somehow remove human “gut feeling” from management altogether?

Push students to interrogate the role of bureaucracies in public management. Regarding the difficulty of implementing data---driven management at the department level, Flowers notes that “bureaucracies are expressly designed to be resilient... because we want them to be able to handle the vicissitudes of elected government,” and that “tribal turf wars” among them “absolutely exist.” Ask students to critically evaluate this view. What purpose do bureaucracies serve and why are they so difficult to change? To what extent are turf wars a necessary side effect of institutional expertise? Flowers opts to work as much as possible within existing bureaucratic constraints, in essence taking turf wars as a given. Is this the correct approach or should more effort be made to break down bureaucratic barriers to government innovation? How might a public manager effect such a change?

Use this case to prompt discussion about the potential and limits of technological innovation in public management. Ask students to identify specific technological innovations that have improved government performance, and push them to detail precisely how the new technology facilitated such improvements. What are some of the risks the adoption of new technologies might pose to government agencies? Are there circumstances in which public managers should avoid embracing new technologies? Conversely, are there technological innovations governments take insufficient advantage of, and how might these technologies improve government performance?

Ask students to consider critically the value of transparency in public management. The Bloomberg administration undertakes efforts to make data the city collects more accessible and usable to citizens. What is the purpose of these efforts? Is transparency good for its own sake, or only to the extent it helps public managers perform their jobs better? In what areas might transparency make it harder for a public manager to do his or her job effectively? Where this tradeoff exists, should it generally be decided in favor of effectiveness or transparency, and why? Are there particular circumstances in which that decision might change? Finally, to what extent should privacy considerations be taken into account in deciding what data to make available to citizens?

As the Bloomberg administration draws to a close, Flowers turns his attention to building a “culture of analytics” at the agency level in case the next administration closes the Mayor’s Office of Data analytics. Ask students to strategize how such a culture might be built. What capabilities are necessary at the agency level? What kind of training do public servants need? Should any area of management be exempt from analytics culture?

Class Plan

Use this case in a course on public management; technology in government; public sector performance evaluation; or government innovation.

Pre---class. Help students prepare for class by assigning the following question:

1) Is New York City's "big data" approach to city management a desirable, or realistic, model for governments in other cities, or even at the national level? How successful was the approach in New York City and, to the extent it was successful, what factors contributed? Are these factors applicable in other contexts, and how?

Instructors may find it useful to engage students ahead of class by asking them to post brief responses (no more than 250 words) to questions in an online forum. Writing short comments challenges students to distill their thoughts and express them succinctly. The instructor can use the students' work both to craft talking points ahead of class, and to identify particular students to call upon during the discussion.

In-class questions: The homework assignment is a useful starting point for preliminary discussion, after which the instructor could pose any of the following questions to promote an 80--90 minute discussion. The choice of questions will be determined by what the instructor would like the students to learn from the class discussion. In general, choosing to discuss three or four questions in some depth is preferable to trying to cover them all.

- a) How did William Bratton bring down subway crime as head of New York's Transit Police? What were some of the key innovations in his approach? Evaluate their strengths and weaknesses.
- b) What were the key organizational failures of the New York City Police Department that facilitated the soaring crime rates of the 1980s and 1990s? To what extent did measurement play a role in these failures? What was City Hall's responsibility?
- c) Given that New York City was arguably a "big data" laboratory as early as the 1970s, when the city began fielding millions of 911 emergency calls per year, why didn't the presence of so much data improve the city government's performance? What was the missing piece between the data and the results?
- d) Which Compstat innovations, both technological and organizational, were responsible for its success? What were some of the program's drawbacks or costs?
- e) Which key organizational failures did NYPD commanders identify as responsible for the deaths of two firefighters in the 2007 Deutsche Bank fire? To what extent were these failures analogous to the NYPD's failures of the 1980s and 1990s, or did FDNY face a different problem entirely?
- f) Why couldn't the Fire Department adopt the Compstat model wholesale? What parts of the model were unsuited to FDNY goals and culture? To what extent was the Fire Department successful in tailoring its own approach? What are the strengths and weaknesses of the FDNY's Risk-Based Inspection System compared to NYPD's Compstat?
- g) Deputy Mayor of Operations Steve Goldsmith identifies as a principal weakness of the 311 system its inability to predict problems (p.10). How might the system

address that weakness? What role, if any, could social media tools play in that process?

- h) Was the Mayor's Office of Data Analytics (MODA) a good concept? Why/why not?
- i) List the four types of barriers Flowers identifies for sharing information between agencies. How do he and his team seek to overcome them? Are they successful?
- j) Describe MODA's methods for pinpointing rogue pharmacies in Staten Island and grease----dumping restaurants in Manhattan. What principles does the team apply? How might these principles apply to other problems?
- k) To what extent does MODA succeed on its own terms? How might a successor organization be set up differently?

Suggested Readings

John Buntin, "Assertive Policing, Plummeting Crime: The NYPD Takes on Crime in New York City," Harvard Kennedy School of Government, August 1999

SYNOPSIS: In this Harvard Kennedy School case study, Buntin traces the origins and implementation of the Compstat system under William J. Bratton. The case study provides detailed information on the data innovation discussed in the first third of the "Big Data" case study, and explains in depth some of the costs the Compstat system entailed, in particular the growth of citizen complaints about overly aggressive policing.

<http://www.case.hks.harvard.edu/caseTitle.asp?caseNo=1530.0>(for purchase)

Dennis C. Smith and William J. Bratton, "Performance Management in New York City: Compstat and the Revolution in Police Management," in Dall Forsyth (ed.), *Quicker, Better, Cheaper? Managing Performance in American Government*, New York: Rockefeller Institute Press, October 2001.

SYNOPSIS: This chapter, written by Commissioner Bratton and Professor Dennis Smith, is both an insider's account and a broad theoretical look at the ideas that informed the adoption of Compstat. While the chapter emphasizes Compstat's successes, it also provides a guide to the managerial principles underlying the program, and how Compstat fits into a broader set of management practices. It traces the history of NYPD management prior to Compstat's implementation, and pinpoints the managerial and organizational changes Compstat brought about in addition to its data innovations.

<http://www.accenture.com/SiteCollectionDocuments/PDF/DennisSmithArticleonPerformanceMeasurement.pdf>

Danah Boyd and Kate Crawford, "Critical Questions for Big Data," *Information, Communication & Society*, Vol. 15, No. 12, June 2012, pp. 662---679

SYNOPSIS: This piece examines what's known as the big data revolution from a media studies perspective, outlining some of the assumptions and biases associated with the spread of big data techniques in industry and academia. In addition to briefly reviewing the early history of computerized databases and some of the sociological literature surrounding the use of data, the paper argues that however large the dataset, data shorn of context loses meaning. It also explores some of the privacy concerns raised by the application of big data techniques to social media.

<http://www.tandfonline.com/doi/abs/10.1080/1369118X.2012.678878#.U5INwy8WcWk>

Alan Feuer, "The Mayor's Geek Squad," *New York Times Magazine*, March 23, 2013

SYNOPSIS: This article traces in depth the formation and early successes of the Mayor's Office of Policy and Strategic Planning under Michael Flowers—the "geek squad" later known as the Mayor's Office of Data Analytics. It details Flowers' background and some of his philosophy, and gives a sense of the day---to---day operations of the office, from finding restaurants illegally dumping grease and clogging sewers to mapping 311 complaints.

http://www.nytimes.com/2013/03/24/nyregion/mayor-bloombergs-geek-squad.html?pagewanted=all&_r=0

Viktor Schonberger and Kenneth Cukier, "Big Data in the Big Apple," (book excerpt), *Slate*, March 6, 2013

SYNOPSIS: This is another, more technical but still accessible look at the kinds of analytics performed by Flowers and his team. It explains briefly what matters about the "big" in "big data"—in essence that a large sample size can help compensate for inexact information. It also illustrates how certain measures, such as number of 311 calls from a given building, can be misleading indicators of the problems they seem to describe.

http://www.slate.com/articles/technology/future_tense/2013/03/big_data_excerpt_how_mike_flowers_revolutionized_new_york_s_building_inspections.single.html