

## IV. Information and Economic Development

There is a reason why it's called the Knowledge Economy. Information has become a principal driver of today's economy. To compete in this economy, cities – like businesses – must understand and adapt to this new environment, the environment of Big Data.

### Big Data

Big data has become the watchword for today's economy. Why has this happened? Because Big Data allows “managers [to] measure, and hence know, radically more about their businesses, and directly translate that knowledge into improved decision making and performance.”<sup>1</sup> Data has always been a key component of private (and public) sector decision-making, but a number of factors have made its importance grow exponentially. Harvard University researchers point to three reasons – volume, velocity and variety – to which we'll add a fourth: value.<sup>2</sup>

- *Volume.* Many of the most important sources of big data are relatively new. Social networks, smartphones and the other mobile devices now provide data consumers access enormous reservoirs of data tied to people, activities, and locations.
- *Variety.* As more activity is digital, new sources of information and cheaper equipment are creating mega amounts of information that exists on “virtually any topic of interest.”
- *Velocity.* Increased computer power has created more powerful analytics. Data is being transmitted, warehoused and analyzed far more rapidly than ever before. From retail to baseball, decision making by data is far more commonplace and viewed as significantly more reliable than relying on “gut instincts.”
- *Value.* Data acquisition has become less expensive because of cheaper computer equipment and seamless and inexpensive methods of data collection. Every on-line transaction or encounter – shopping, social networking, emailing, driving – is now automatically collected and has produced a tsunami of information. Tethered to our mobile devices, “each of us is now a walking data generator.”

How is big data being used? The retail sector has been an early adapter.

Retailers can now “track individual purchases and item sales, capture the exact time at which they occur and the purchase histories of the individuals, and use electronic inventory data to link

***“You Can't Manage What You Don't Measure.”***

Attributed to both W. Edwards Deming and Peter Drucker.

***We Don't Need Your Stinking Sales Numbers!***

The hotshots at MIT used GIS data from cell phones to figure out how many folks were in a Macy's parking lot on Black Friday – and then accurately predicted that day's take even before Macy's had rung up the sales.

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<sup>1</sup> The Data Revolution and Economic Analysis”, Liran Einav and Jonathan Levin, Stanford University and National Bureau of Economic Research, 2014.

<sup>2</sup> “Big Data: The Management Revolution”, Andrew McAfee and Erik Brynjolfsson, Harvard Business Review, October 2012.

purchases to specific shelf locations or current inventory levels.”<sup>3</sup> Information generated by on-line purchases is even richer: on-line retailers can track a buyer’s behavior around the sale, including the “initial search query, items that were viewed and discarded, recommendations or promotions that were shown, and subsequent product or seller reviews.”<sup>4</sup> All this data can be linked to “demographics, advertising exposure, social media activity, off line spending and credit history.”<sup>5</sup>

## **Big Data and Cities**

Cities have always collected data. For the past several decades, public safety – police and fire – have been in the forefront in using statistics to improve performance. Successful police departments deploy their resources based on up-to-date data and analysis. Successful fire departments are organized by analytics to ensure adequate response time.

One of the keys to successful economic development – as in other ventures – is to gather important information, anticipate trends, rapidly adjust to change and adopt policies and make decisions that better position a jurisdiction for economic success. For cities, that requires four distinct functions:

- Gathering, compiling and communicating accurate, important data.
- Synthesizing and communicating disparate data and trends into a comprehensible analysis.
- Understanding emerging concepts, trends and developments that impact the City.
- Encouraging decision-making that is informed by data and trend analysis.

The phrase most used to describe the process that incorporates data into management is Data Driven Decision Management, often known as D3M.<sup>6</sup>

D3M is a management approach that encourages decision-making that is driven and supported by verifiable data. This data-driven process is increasingly the standard operating procedure in the private sector as the availability of data has increased in concert with market pressures.

### ***D3M Economic Impact***

MIT researchers found that companies that adopt D3M achieve 5 to 6 percent higher productivity and output growth than peer firms. They found the same advantage in asset utilization, return on equity, and market value.

The public sector is slowly adopting the D3M approach. One reason is the amount of additional information now available to public sector decision makers. A second reason is diminished financial resources in the face of increased demand: If you’re going to do more with less, you better use your resources effectively.

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<sup>3</sup> Op.Cit., Liran Einav and Jonathan Levin.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> “Data Science and Its Relationship to Big Data and Data-Driven Decision Making”, Foster Provost and Tom Fawcett, Big Data, February 2013.

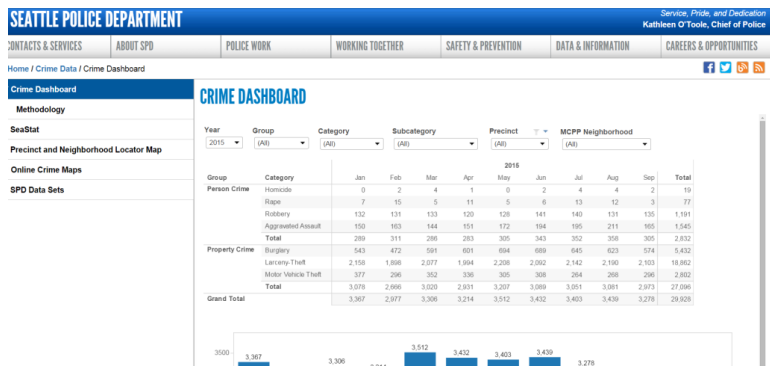
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What information can and should be gathered in a D3M world? Information from multiple sources that is current, accurate and useful. Cities engage in numerous data collection efforts, but typically are not bringing all these data streams together, compiling them, and analyzing their impact in an integrated manner. Examples of data streams include some that are relatively static and some that are quite variable:

- Demographic (population data sliced and diced)
- Econometric (employment by sector, business licenses, permits, hotel occupancy, etc.)
- Education (enrollment, test scores, graduation rates)
- Real Estate (commercial, industrial and residential sales, prices, lease rates)
- Public Safety (calls for service, response time, crime data)
- Services (library usage, utility usage, pothole repairs, etc.)
- Transportation (freeway traffic, airport traffic, mass transit usage)
- Revenue (property, sales and use, transient occupancy taxes)
- Regulatory Activities (code enforcement, parking tickets, permits)

The closest most cities get to a comprehensive data compilation is in an annual budget presentation. But typically information in budget documents is dispersed throughout the document, and if it is compiled, it is in the form of bullet points: x miles of sidewalks repaved, x trees trimmed, x building permits issued. This is why observers believe public sector data – particularly at the local level – is almost certainly underutilized, “both by government agencies and, because of limited and restricted access, by researchers and private data vendors who might use this data to uncover new facts.”<sup>7</sup>

Some cities have been making a concerted effort to better gather, compile, analyze and integrate findings – and then make the data available to the public. New York City, prompted by then Mayor Michael Bloomberg, has made data acquisition, analysis and integration a priority – no surprise, as Bloomberg’s business was information management. Seattle, Atlanta and Denver are among the cities that are making crime reporting a part of open data initiatives. [Revising the required Uniform Crime Reporting by cities to the FBI is a major topic of research and review.]



A number of efforts have been underway to better incorporate data into city decision-making and to make more data available in an accessible manner. This is known as the “open data” movement and certain cities have become early adapters. The site data.gov provides links to applications currently employed by numerous cities. It argues that open and transparent data can have measurably and positive impacts, including: “cost savings, efficiency, fuel for business, improved civic services, informed policy, performance planning, research and scientific discoveries,

<sup>7</sup> “Big Data’s Economic Impact”, Joseph Kennedy, Committee for Economic Development, December 3, 2014.

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transparency and accountability, and increased public participation in the democratic dialogue.”<sup>8</sup>  
The site [us-city.census.okfn.org](http://us-city.census.okfn.org) lists United States cities and the type of open data sets they make available to their citizens.

Cities in the U.S. and around the world are creating “dashboards” for the display of captured data. Major (such as Microsoft) and minor software developers have developed dashboards for cities to use. Cities then just have to populate the dashboard structure with their own data. There are now hundreds of examples; here are but a few:

- [www.cityofboston.gov/majorsdashboard](http://www.cityofboston.gov/majorsdashboard)
- [www.dashboard.reno.gov](http://www.dashboard.reno.gov)
- [www.citydashboard.org/London/](http://www.citydashboard.org/London/)
- [www.performance.houstontx.go](http://www.performance.houstontx.go)

Cities in the vanguard of the open data movement have acknowledged that the impact of open data has not yet been established. San Francisco’s open data site – [datasf.org](http://datasf.org) – has discussed a key issue: what’s the value of “invest[ing] the effort in a comprehensive open data effort.”<sup>9</sup>

The impetus on making data open and transparent has been to better inform residents. But the biggest impact for cities (and Long Beach) of better gathering, compiling and analyzing data is likely to be better internal decision making. The private sector has used Big Data to refine decision-making – and become more nimble and effective as a result. Without the market-driven imperative to make the right choices effectively – if data shows a product isn’t selling, slow production! – the public sector has been slower off the mark. Better decision-making really depends on using Big Data effectively.



One of the primary users of a more integrated and open data system in the public sector would be the private sector – and organizations, such as Business Improvement Districts, whose mission is to make it easier for firms to do business in Long Beach. Business owners, developers and investors need up-to-date and accurate data to make well-informed investment decisions. Markets – and demographics – often change more rapidly than Census data. For example, new residents can impact median household income levels and the kind of workforce available to employers; and those changes can have a major role in encouraging new investments (and new businesses) in Long Beach. Reliable and current data that is readily available to the private and nonprofit sectors will benefit economic development efforts in the City.

<sup>8</sup> “Impact”, [data.gov](http://data.gov), April 2016.

<sup>9</sup> “How to Measure Open Data”, [datasf.org](http://datasf.org), 2016.

## **Using Big Data Effectively**

Gathering and presenting data is not enough. D3M requires that you make sense of it. That means being able to integrate various data streams and draw reasonable conclusions. In this area, the private sector is miles ahead of the public sector.

One way to effectively understand and analyze public sector data would be to tap into updated research and recommendations from multiple sources. Other cities and regions have had successes and failures and every city can benefit from those real-life experiences. There are numerous urban think tanks and university centers that focus on the issues faced by cities, and they offer useful information and observations based on program/project evaluations. Incorporating their insights on an ongoing basis would provide the City with additional intellectual resources – at little cost. In other words, Long Beach doesn't have to rely solely on internal resources; it can leverage the outside resources that are already available.

One method to access these outside intellectual resources would be an ongoing alliance with a university. Universities – by definition – are where knowledge is assimilated and transmitted. That's their purpose – and that is why collaboration with a university is not just advantageous, it is now a necessity. An obvious partner for Long Beach in such an effort would be CSULB, whose faculty and expertise is a largely untapped reservoir. Formalizing a relationship with CSULB to provide this function would pay significant dividends – both in the acquisition of knowledge and the strengthening of a key relationship for the City.

## **Recommendations**

Cities are, some with reluctance and some with gusto, entering in the world of Big Data. One impetus is the need for transparency, which clearly is driven by the fact that online users are now very accustomed to accessing mountains of information freely and readily – and in seconds.

A temptation for any city is to create and populate a dashboard of information, and then call it a day. But the most important reason for gathering data is for better decision-making – the kind of decision-making that will benefit economic development in the City.

Long Beach would be well served if it increased its efforts to gather, analyze and then make that information readily available. The private sector relies on consistent, accurate and up-to-date information in their daily transactions and decisions. Firms are increasingly sophisticated in filtering layers of data in making location choices, and cities that don't deploy data in an accessible format are at a disadvantage.

But a great looking dashboard of data is not enough. Decisions that impact economic development efforts in the city (and what decisions don't?) would benefit from better data and recommendations based on dispassionate and independent analysis. An office that provided this service could serve as an in-house Research and Development (R&D) department for the city. R&D plays a pivotal role in the private sector – even for non-tech firms – and considering the velocity of change, should play a similar role in the public sector. The Bloomberg-funded Innovation Team is a start in this direction. Typically, however, initiatives such as the i-Team wither away once grant funding is

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exhausted. Institutionalizing the function of providing an unbiased, straightforward and informative evaluation of information would provide long-term benefits for the City.

This function could be located in a number of existing departments. The Development Services Department already has a planning function, and information is the foundation for any planning activity. The Technology and Innovation Department is, by definition, experienced in information compilation. The City Manager's Department plays a coordinating and overall management function for the City, and information integration is part of its responsibilities.

Another model that might work to the City's advantage would be to establish an office similar to the Legislative Analyst Office in Sacramento. The LAO provides fiscal and policy research and advice to the Legislature on a nonpartisan basis. As an independent entity, its evaluations are considered unbiased; in the vernacular, "Just the facts, ma'am." Such a function in Long Beach might find a home in the Auditor's Office, which by City Charter is an independent office of the City that provides independent analysis based on objectivity, competence and integrity.

Wherever the function lies, Long Beach should redouble its efforts to gather, compile, integrate, analyze and broadcast information.