Reaching for Big Data: Using Analytics to Address Organizational Challenges

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Reaching for Big Data: Using Analytics to Address Organizational Challenges

The allure of "big data" is insight. Its advocates seek to create new knowledge and enrich decision making by drawing on massive stores of data and harnessing advances in computing power, automation, and analysis (Bisel, Barge, Dougherty, Lucas, & Tracy, 2014; Puschmann & Burgess, 2014). The move toward data-intensive knowledge creation is reflected in advances in computational social science (Lazer et al., 2009), the push for evidence-based practice (Pfeffer & Sutton, 2006), and organizational efforts to derive competitive advantage by understanding their data with more sophistication (Davenport & Harris, 2007).

The following narrative explores our experiences working with data. The case follows the creation of a 360-degree (or multipoint) leadership development tool. The trajectory of our 360 and the datasets it created demonstrate the multiple ways in which consultants may work with data. From the start, we created data-rich systems informed by organizational and communication science, and embedded systematic analysis of data into the reporting to clients. We describe too our efforts to use the data produced by the 360 in the aggregate to generate insight for teams of leaders. We conclude with our efforts to link the data we created through this project with other data sets to inform executive decision-making. The case highlights the technical and social challenges of working with data inside organizations.

Data-driven decision-making was very important at Multiline Communications (MC), a Fortune 500 firm. Their focus on data paralleled waves of high-profile analytics-focused books (Ayres, 2007; Davenport & Harris, 2007) and analytics success stories (Lewis, 2003; Silver, 2012; Zaillian, Sorkin, Chervin, & Lewis, 2011). For MC, analytics meant using more readily available computing power to derive insight from existing organizational data that might provide an advantage to the business. Mining big data typically concerns predictive accuracy (e.g., will a

customer default on their credit card?) over traditional social scientific explanation (Bisel et al., 2014; Foster & Stine, 2004; Friedman, 2001; Hand, Blunt, Kelly, & Adams, 2000). At MC, the promise of analytics and predictive tools in leadership development were gaining traction just as The Aslan Group was developing and implementing a company-wide system for conducting 360-degree or multipoint assessments (Antoniono, 1996; DeNisi & Kluger, 2000; Salam, Cox, & Sims, 1997) focused on leadership development for MC.

Founded in 1985, The Aslan Group conceives of itself as a small community of consultants focused primarily on executive coaching, leadership development, and communication process design. The Aslan Group's principals develop projects drawing on consultants from business and academics, many with research backgrounds. Aslan often relies on data-intensive, research projects to address clients' problems. Aslan's core strengths include applying organizational communication theory and methods to address pressing business problems. Aslan also creates and facilitates communication processes that help organizations see themselves, and coaches leaders in teams and one-on-one to make them more effective.

Developing Data-Rich Tools

Aslan first began negotiations with MC for the development of a 360 focused on leadership behaviors in the late 1990s. MC had previously crafted the MC Leadership Model (MCLM) focusing on the specific components of leadership they believed led to success in their organization. They wanted to create a suite of development tools grounded in the MCLM. Aslan had often worked with the division of MC focused on leadership development and other learning functions, the Learning Academy. Bob had been involved in the development of the MCLM, and the Learning Academy asked him to assist. We gathered a project team led by Bob, Shirley, and Josh. Over a few weeks, Bob met with the Learning Academy and negotiated a fixed fee and a

per participant price for the development of (a) an assessment tool and (b) an online system for administering the 360s.

Approaching the problem like a research project, we drafted items for the assessment derived from the MCLM. The MCLM was comprehensive, encompassing eighteen specific areas (e.g., communication, teamwork, vision). It was also developmental, in that specific skills and behaviors were articulated for each area at differing levels of leadership (e.g., manager, director, executive). We drew out key behaviors from each area and translated them into items. We verified the items by gathering test data and then refined them using factor analysis. We were left with a 60-item assessment, (2-3 items per area) including 4 overarching dependent variables (e.g., "This person is an effective leader").

We worked with multiple programmers to design and implement an online system that would collect and collate assessment data, generate individualized reports for participants, give MC access for monitoring participant progress, and manage invoicing for the per-participant cost. We worked side-by-side with the programmers translating the measurement and reporting functions needed into the application over several months. MC had over 50,000 employees, and no fewer than sixty individuals in the company's Learning Academy would have access to the system for entering participants' contact information and monitoring their progress. We created a separate support function to handle technical problems and recorded a support video demonstrating step-by-step instructions. After a soft start to allow for fixing technical problems, we launched the system to the entire company, and MC used it for the next 10 years.

The 360 data set eventually contained approximately 4,500 participants and 30,000 evaluations of those participants. The system included functionality for drawing on this large repository of data for benchmarking. Participants were able to see how their scores compared to

other leaders at MC, and the reporting function guided participants through an analysis of their own results weighted by priorities set by participants and their supervisors. In this way, simple analytics were incorporated into the reporting of the results automated for participants.

Small Data: Using the 360 for Leadership Development

A year into the implementation, Bob reached out to Shirley and Josh with news. An opportunity had developed at MC to use the 360 specifically with a group of top performing individuals (TPIs) who had been identified for development as part of MC's succession planning. The Aslan team discussed a strategy for the identification, implementation, and analysis as the TPIs completed the assessment. Once the TPIs completed the 360 their data would be analyzed and presented in a workshop setting.

By this time, the size of MC's participation in the 360 had grown to about one thousand participants involving about six thousand evaluations. The 360 data offered a useful analytical tool for generating insight informed by the MCLM. We were able to identify the behaviors that those completing the 360 viewed as most closely associated with leadership effectiveness. We were able to use the entire data set for benchmarking while focusing analyses on specific groups within the company.

We ran models looking specifically at the top performers comparing them to MC as a whole. The TPIs performed better on all but two behaviors in the assessment. More specifically, the TPIs were seen as distinctive in their focus on prioritizing the development of others. Indeed, across the data sets, the behaviors associated with leadership effectiveness in general were other-focused. Most importantly though, using the data, the team could discern the TPIs from the rest of the organization with a great deal of accuracy, which meant the data might be useful as a tool for predicting future leadership success.

Word spread throughout MC after Aslan presented the results to the first group of TPIs. Other units clamored to complete 360s, compare their scores to the TPIs, and look for insights about their units' leadership. For a couple of years, the Aslan team booked many such projects and presented the results in workshop settings. These analyses were small projects in the sense that they were focused on particular teams, yet they drew on extensive data—the 360 data across the whole company and more specifically the 360 data for the TPIs.

Integrated Data: Connecting the 360 to Existing Data at MC

At the end of one of these workshops in which we shared 360 results, the Vice President in charge of the Learning Academy, Ben, approached Bob. The Academy was dedicated to training and development throughout the organization, but was particularly interested in making their mark in executive leadership development. He wanted to take the 360 data and the promise of the insights it might generate to the top executives in the company. The organization was increasingly looking for ways to draw competitive advantage by mining the large databases they possessed. Until now the Academy had never had an opportunity to contribute to MC's competitive advantage through the use of data and analytics. Now, through an aggregation of the 360 data, the Academy could speak to leadership behaviors that most directly contributed to leadership effectiveness at MC.

Ben scheduled meetings with other key executives for Aslan to present its findings. For example, Bob and Ben were asked to visit privately with the Senior Executive Vice Presidents of Operations and Human Services to share their findings regarding the Leadership Model, its validity, and its relevance to leadership development within the company. The executives expressed concern because the data seemed, on the surface, to be contrary to the CEO's upcoming public announcements about getting results as a leadership focus for MC. The leaders

had zeroed in on a pair of non-significant but negative correlations between goal attainment and leadership effectiveness. Bob explained the results and highlighted other aspects of getting results (e.g., teamwork, influence, and courage) embedded in the MCLM. By creating a more nuanced understanding of the findings, Bob helped alleviate their fears and give strategies for presenting the information to the CEO.

On another occasion, Bob and Josh went to the organization's headquarters to join Ben in meeting with Evan, the Senior Executive Vice President (VP) of Sales and Marketing. Josh felt nervous, having never visited the executive floor. Bob had visited with this executive many times and put Josh at ease. When Evan arrived, Ben opened the discussion explaining that he felt they had data, specific to the company, they could use to derive a competitive advantage. He commented on how excited he was that the Learning Academy had developed its own data and garnered insight from it. Bob and Josh described how they hoped to integrate the 360 data with existing, internal company data to make the leadership modeling more robust. We explained how the data integration might more effectively let MC predict leadership in sales and marketing.

We knew that the data they were hoping to integrate existed in many different places throughout the company. To make matters worse, several of the units felt protective of their data—a common challenge to consultants attempting to build support for programs across large, complex organizational systems. For example, People Systems, the company's human resources unit, held most of the data and believed they owned leadership development. While another unit in the company, Tactical Research, which focused on research and development, believed it was solely responsible for marshaling data into competitive advantage insights. Other units also saw themselves as co-owning leadership development with the Learning Academy and/or saw their control of data-driven insights threatened by Aslan.

Analysis was difficult too because the data were not connected. Connecting them meant not only solving difficult data problems (i.e., connecting complex databases containing hundreds of thousands of data points) but also organizational ones. Getting data connected meant working across divisions. People at MC tended to be reluctant to share data without passing the request up through the hierarchy. Making those connections might also create problems. For example, linking sensitive employee data and providing that to an external contractor meant exposing the data. At MC, data were tightly controlled.

Evan asked a few questions about the model and what we had learned. He seemed noncommittal but interested. The meeting finished without a specific action plan. Bob explained to Josh in private that Evan got million dollar pitches every day and to be patient.

A few weeks later, we received our data challenge. We were given a list of a dozen names. The list, compiled by Henry who worked in People Systems, contained a randomly selected group of individuals identified as TPIs. The challenge was to distinguish the truly top performers. Generating a new discriminant analysis in combination with existing data, Josh developed a model to identify the "best of the best" performers. A meeting was set with Henry and his team, and Hazel, a representative from Tactical Research, to share the results of Josh's analysis.

Hazel asked questions about the modeling and the quality of the data. She challenged, "The relationships between these variables are so high. Aren't these results just a by-product of multicollinearity?" Josh noticed that the questions puzzled the rest of the people in the meeting. He explained the problem of multicollinearity to the group as a whole: "The danger with measuring this sort of phenomena, is that you might end up measuring the same thing. So, it can be hard to know if the predictive power you have is meaningful or just echoes." At the same

time, Josh had to respond to the interrogation in terms that Hazel would buy. He explained, “We use diagnostics to look for that sort of problem.” Josh walked through concepts like tolerance and variance inflation factors. He then explained that the we had looked for those problems and not found any. The meeting continued with Henry and Hazel challenging the results.

As Bob and Josh left the meeting, it was not clear what would become of the 360 data integration initiative. Bob called the meeting a success; Josh had doubts. Bob slapped Josh on the back and said, “You kicked butt. You couldn’t have done better.” The team had been able to respond to all the challenges; and Bob pointed out that what made the interaction most effective was that we had been able to translate and explain the data to everyone at the table while still responding to Hazel’s concerns.

Discussion

This case offers at least three examples common to the use of data in consulting: problem-focused research projects, analysis for problem solving relying on data for benchmarking, and integrating data across the organization to inform executive decision making. As a research project, the development of the 360 assessment and the means by which data were delivered drew on expertise in measurement, analysis, and data reporting. Working with particular units, we could draw on the larger body of 360 data to frame unit-specific analyses. Using data to assist executives in decision-making depended on understanding leadership and communication theory, organizational theory, and research design and analytics.

These examples also make clear the challenges involved. In Josh’s work with organizations, he had a refrain, “People with an agenda hate data.” Developing and using data interacts with organizational politics. Working with data involved negotiating internal and external boundaries across units and expertise differences. MC had hoped to make use of data to

drive decision making, and they relied on expertise outside of the organization as well as from multiple units within. Aslan's engagement in this case depended on a long-term relationship with the company as well as a deep understanding of analytics *and* the particular issues facing MC. For Aslan, navigating those boundaries required careful relationship management, technical skill, and mentoring within the community of consultants. Acting as data translators, Aslan had to explain the results to experts, fluent in the latest techniques, and general audiences with little knowledge of or interest in them.

References

Antoniono, D. (1996). Designing an effective 360-degree appraisal feedback process. *Organizational Dynamics, 25*, 24-38.

Ayres, I. (2007). *Super crunchers: Why thinking-by-numbers is the new way to be smart*. New York, NY: Bantam.

Bisel, R. S., Barge, J. K., Dougherty, D. J., Lucas, K., & Tracy, S. J. (2014). A round-table discussion of "Big" data in qualitative organizational communication research. *Management Communication Quarterly, 28*, 625-649.

Davenport, T. H., & Harris, J. G. (2007). *Competing on analytics: The new science of winning*. Boston, MA: Harvard Business School Press.

DeNisi, A. S., & Kluger, A. N. (2000). Feedback effectiveness: Can 360-degree appraisals be improved? . *Academy of Management Executive, 14*, 129-139.

Foster, D. P., & Stine, R. A. (2004). Variable selection in data mining: building a predictive model for bankruptcy. *Journal of the American Statistical Association, 99*, 303-313.

Friedman, J. (2001). The role of statistics in the data revolution. *International Statistics Review, 69*, 5-10.

Hand, D. J., Blunt, G., Kelly, M. G., & Adams, N. M. (2000). Data mining for fun and profit. *Statistical Science, 15*, 111-131.

Lazer, D., Pentland, A., Adamic, L., Aral, S., Barabasi, A.-L., Brewer, D., . . . Van Alstyne, M. (2009). Computational social science. *Science, 323*(5915), 721-723.

Lewis, M. (2003). *Moneyball*. New York, NY: W.W. Norton and Company.

Pfeffer, J., & Sutton, R. I. (2006). *Hard facts, dangerous half-truths, and total nonsense: Profiting from evidence-based management*. Boston, MA: Harvard Business School Press.

Puschmann, C., & Burgess, J. (2014). Metaphors of big data. *International Journal of Communication, 8*, 1690-1709.

Salam, S., Cox, J. F., & Sims, H. P., Jr. (1997). In the eye of the beholder: How leadership relates to 360-degree performance ratings. *Group & Organization Management, 22*, 185-209.

Silver, N. (2012). *Signal and the Noise: Why some many predictions fail*. New York, NY: Penguin Press.

Zaillian, S., Sorkin, A., Chervin, S., & Lewis, M. (Writers) & B. Miller (Director). (2011). Moneyball. In S. Zaillian (Producer): Sony Studios.