



SPEAKING OUT

How Data Visualization Can Change Diplomacy

By CHRIS BRONK AND SCOTT SMITH

In the latest installment of the State Department's Tech@State conference series, nearly 300 people from a range of technology and foreign affairs fields converged at the Kennedy Center on Sept. 22 and 23, 2011, for a discussion of how information relevant to foreign affairs may best be portrayed visually. Organized by the State Department's Office of eDiplomacy, the event brought together visualization technologists, social scientists, representatives of nongovernmental organizations and foreign affairs professionals.

Kerri-Ann Jones, assistant secretary of State for oceans and international environmental and scientific affairs, who holds a Ph.D. in molecular biophysics and biochemistry, opened the conference by telling the audience this:

"From the perspective of a scientist, it is important to be able to present data and findings to public audiences and to our peers. Pictures and charts are, of course, a big help in this. Data visualization is something more [that] is being used effectively in so many arenas already.

"It is being used in disaster response and coordination, strengthening the ability of communities to respond. It is helping information become more transparent and accessible to society in general. It is allowing donors to see how their money is

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being used in projects ranging from disaster relief to climate change. Data visualization shows progress being made, bumps along the road and pledges being fulfilled."

To meet the challenge of using data visualization to achieve greater effectiveness in diplomatic work, here are two important questions for the State Department to consider: How do we evolve beyond text-only formats, to be able to see the world in increasingly rich and vivid detail? And how can policymakers process enormous quantities of data in meaningful ways to better inform policy decisions?

Data Visualization and Foreign Affairs

To use smart power to advance U.S. foreign policy interests in a complex world, the State Department needs to harness technology to provide greater clarity, detail and focus on a myriad of difficult questions. In

other words, State must literally see the world differently.

For this to happen, foreign affairs professionals must become comfortable with new technologies and methodologies in an information environment characterized by a rapidly increasing pace, volume and complexity. Faced with a deluge of information, we must not insulate ourselves from the world, but use technology more effectively to cope with complexity, see subjects in new ways, and find better solutions to hard problems.

The State Department needs to jump, and not timidly, from a reliance on text and documents to an embrace of a much richer media and information world.

It is helpful to realize that the field of knowledge management is built on the idea that information is distilled from raw data, and from information comes knowledge. That knowledge then leads to understanding and is the key element of decision-making.

Historically, information was often scarce or inadequate, and the primary challenge was gathering it. Perhaps as a result, we assume that the greater the quantity of accurate information, the better for decision-makers.

But too much information, coming too fast, can overwhelm cognition and lead to indecision. As a result, we may not focus on what matters most, may skip analysis, or be tempted to choke



off the flow of information altogether.

We can head off such problems by filtering and managing the flow of information to make it meaningful, so we can apply it to making sounder decisions and achieving better outcomes. In particular, graphic and video images can make ideas more engaging and persuasive than text or data alone.

**Open Data:
From Graphs to Platforms**

Consider the figure French engineer Charles Joseph Minard drew for his study of Napoleon's 1812-1813 campaign in Russia (see below). Visualization pioneer Edward Tufte has called this diagram, which shows the original size of Napoleon's army in beige and its size during the retreat from Moscow in black, perhaps the most effective visual diagram ever constructed. Combining geography, force size and temperature (on the separate scale below the map), it explains in a single picture the disaster

Platforms that support data interaction encourage users to explore and use the data to extract their own meaning or conclusions.

that was the French campaign to invade Russia.

News publications have been using catchy info graphics for just that purpose for years now. Their widespread availability helps us see meaning we might otherwise miss in data on sports, business, crime and other topics.

While seeing data represented as

images can be helpful, such images — like prose — often incorporate the interests or biases of those creating them. Potentially more powerful is the ability to interact with and manipulate visual representations of data. Such tools could empower decision-makers to pull together data reflecting diverse phenomena and to see complex relationships between and among geography, finance, politics and other factors. Platforms could also bring together multiple applications or sources into a single interface or “mash-up.”

Platforms that support data interaction encourage users to explore and use the data to extract their own meaning or conclusions.

The OECD Better Life Initiative is just such a platform at a multilateral level, with information about countries that are members of the Organization for Economic Cooperation and Development (see p. 13). This initiative contributes to numerous U.S. foreign policy goals, from promoting more

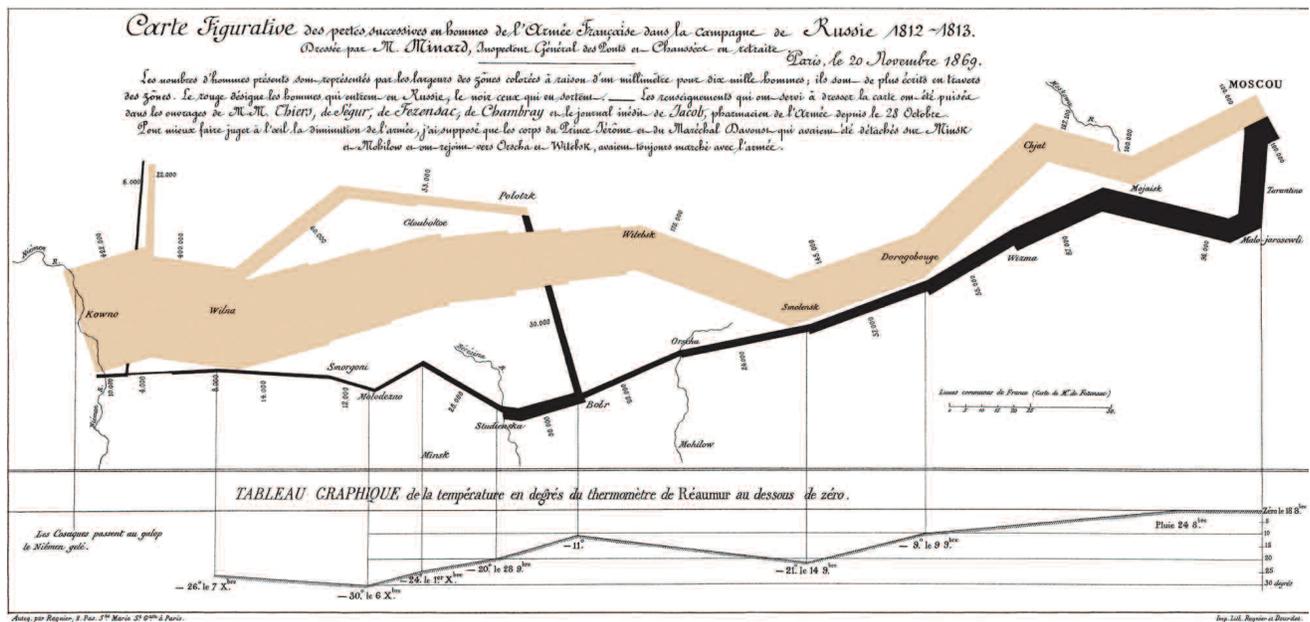


Figure depicting the size of the French Army before and after Napoleon's Moscow campaign, 1812-1813.

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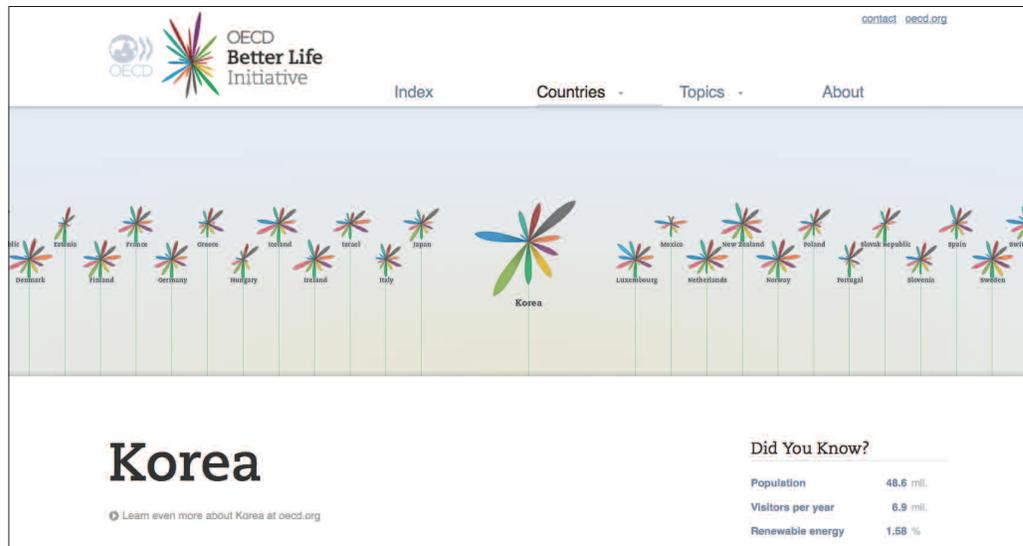
transparent public policies to encouraging more consistent and transparent international marketplaces.

Such transparency, however, also drives competition among countries to achieve more effective policy environments in order to attract investment and business activity. This competition, in turn, rewards those countries that embrace these new technologies and use them to capture, utilize and display their data.

Visualization needn't be the creation of highly specific technical artistry, however. It is desirable for the process to flow down to workers who typically work with word processing and spreadsheet applications. To note just one of the many online tools freely available to the public, IBM's Many Eyes can support data visualization with any dataset and requires no software download. It also allows users to rapidly import data from a spreadsheet, database or other digital file format.

One can easily map a single parameter for geographic context — as shown in the diagram at right with Standard & Poor's sovereign debt ratings — or layer multiple parameters to explore more complex relationships.

For a public institution like the State Department, there are two broad applications for data visualization. First and foremost, it has great potential to ad-



OECD's national well-being visualization.

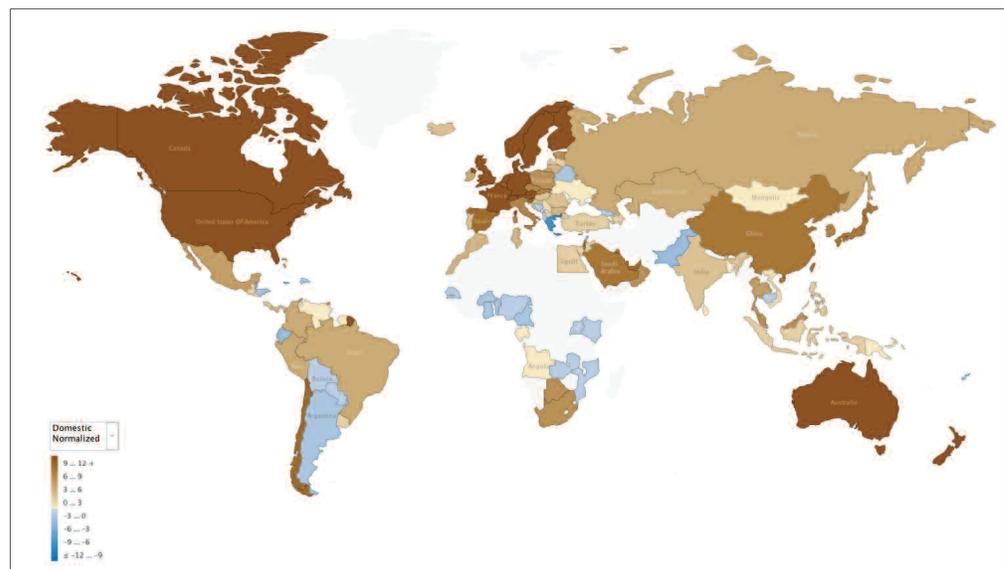
vance mission objectives. But we should also consider its role in changing public expectations of government and the importance of disseminating government data in an open and transparent way for the general public to interact with and use.

This dual-hatted approach reflects an Obama administration priority outlined in the Data.gov Initiative. It also

positions State for a leadership role in a growing, international, open government movement. Such disciplines may well improve the credibility and effectiveness of our international messaging and policy advocacy.

Visualizing Data at State

The Department of State has long been a vast producer, consumer and



IBM Many Eyes visualization of sovereign debt ratings, August 2011.

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Frequency diagram of tags in 60 unclassified cables identified by the search terms “science” and “diplomacy” gathered between August 2010 and August 2011.

repository of information, much of which appears in unstructured text, e-mails, memoranda, cables and other documents. Trying to cope with the flurry of messages from Versailles at the conclusion of World War I, the State Department adopted a system of

metadata, known as TAGS, to assist in quick delivery of messages to the relevant recipients.

Today, that system still serves as a taxonomy for filing and archiving, and it also functions as a basis for rudimentary analysis. The diagram above

shows a word cloud depicting the frequency of tag use in a set of 60 cables generated by a search for “science” and “diplomacy.”

Considering that TAGS were introduced nearly a century ago, the system has aged well. Still, as knowledge workers in an information economy and as managers of State’s knowledge assets, we

should look to do better, and not wait for some catastrophe to force change.

Technologies currently in use in the State Department serve those who already know what they are searching for. In contrast, visualization opens up

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1. FSI’s Transition Center
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3. Security Overseas Seminars: PSOS, ASOS, SAA, SOS, SOS
4. Transition Center Training home page for eligible family members and members of household (MOH)
5. International Jobs - Working Overseas
6. Country Information (Bidding Resources)
7. Transition Center Courses
8. Preparing to Go Overseas
9. Pets and International Travel
10. Foreign Service Assignment Notebook: What Do I Do Now?
11. U.S. Department of State Career Transition Center (CTC)
12. Personal Post Insights
13. Elementary School Stuff
14. Arrange Medical Clearance and Immunizations
15. High Stress Assignment Outbrief Program



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new ways to manage knowledge, by seeing phenomena as connections, patterns and trends, rather than as documents or pieces of information. It's a movement from "I know what I'm looking for" to "I need to see what I *should* be looking for" — a rather different approach to problem-solving.

In science and engineering, visualizing has become a fundamental aid to asking the right questions, helping us to address the age-old problem that "we do not know what we do not know." To quote Lewis Platt, former CEO of Hewlett Packard: "If HP knew what HP knows, it would be three times as profitable."

Exploration of the applications and mechanics of how State could use data visualization in practice is better left to

Today's information environment is characterized by rapidly increasing pace, volume and complexity.

another paper. But as the government invests in using such tools to enhance defense and intelligence missions, should we not consider what advantages we might gain from applying

them to our diplomatic and development goals? And can we really afford to keep relying on documents and textual narrative as our knowledge paradigm, rather than adopting new technologies to pursue our national interests?

What Next?

Here are three broad ways in which data visualization could benefit State:

- Deriving more value from data in order to better formulate foreign policy;
- Understanding data better in order to operate more efficiently and effectively; and
- Supplementing public diplomacy to communicate more effectively.

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Recognizing that these trends are global and being driven by forces outside the department, there is no need for State to invent or own such technologies. That is good news, for that will greatly reduce the costs and progress need not be held to the pace of government.

The opportunity and the challenge for foreign affairs agencies like State will be to find new ways to collaborate with academia, nongovernmental organizations, industry and foreign partners, and to commit to keeping information open to the maximum extent possible.

Institutionally, these methodologies offer inexpensive ways to respond to growing pressures to be more ef-

fective with limited resources. Bureaus may incorporate visualizations to formulate better policies, implement them more effectively or present them more compellingly. State's leadership should encourage adoption and development of such practices.

At the same time, success in any reasonable time frame will require these technologies to be embraced by State employees, democratizing visualization. Workers need to be able to integrate internal and external data sources, and for this they will need to access emerging external data aggregation and social media tools, with the latest browsers, from their desktops.

Making employees more capable will make the Department of State

(and the other foreign affairs agencies) more capable. ■

Chris Bronk is a fellow in Rice University's James A. Baker III Institute for Public Policy, and also teaches in Rice's computer science department. A Foreign Service officer from 2002 to 2006, he served in the Office of eDiplomacy from 2005 to 2006, where he participated in the development of Diplopedia.

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