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Unlocking supply chain potential
Analytics for emerging economies

Contents

Executive summary

With the advent of big data, faster computing, and intuitive analysis tools, the promise of analytics has generated a renewed focus on improving operations through data-driven decisions. For supply chain organizations in particular, it is a powerful ally in driving cost reduction strategies and service level improvements. From public sector entities like Lincolnshire who identified £24m in procurement savings[1] to retail giants like Tesco who reduced £50 million in excess inventory,[2] organizations across the globe are achieving substantial impact by applying analytics to their operations.

But what about a developing economy like Southern Sudan, where the country lacked the data to forecast vaccine needs to provide immunizations to its citizens?[3] Or in Ukraine, where logistics monitoring and evaluation improved, but data limitations still led to occasional stock-outs.[4] Donor institutions and partner governments seek to make evidence-based decisions to achieve sustainable results. Yet in countries like these, insufficient data and inconclusive analyses are often the norm.

Despite the challenges, constituencies are finding ways to navigate the analytical limitations and constraints often encountered in the development sector. Supply chain analyses are becoming more substantive and targeted, leading to more actionable interventions and tangible results. The following are principles which have guided a number of developing countries in their analytic efforts.

Join the small data revolution

Success does not always hinge on a large scale, long-term investment in a data warehouse or big data. For a low- and middle-income country, it may not even be feasible. Progress can be accelerated through incremental, short-term initiatives that are designed to enhance the value of much smaller data.

Engage in visual storytelling

Countries are inundated with countless supply chain reports and assessments conducted by a wide range of constituencies — making it difficult to digest information, inform decisions, and affect change. Simplifying this complexity through data visualization helps filter out the noise and zero in on what matters most.

Invest in the right requirements

Supply chain performance analyses abound in many countries, but they may not always provide the right evidence to conclusively support the required decisions. Metrics do matter, but defining critical success factors for which performance indicators are predicated on is arguably more important.

To unlock the value of analytics in such unconventional environments, the development sector may be required to re-think, re-tool, and re-evaluate traditional strategies around data and analysis. In doing so, it might not only inform decisions, but empower countries to achieve sustainable results.

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[1] Lindsay Clark, Procurement function to squeeze value from supply chain analytics, **http://www.computerweekly.com/feature/Procurement-function-to-squeeze-value-from-supply-chain-analytics** (Sept 2012)

[2] Swabey, Pete, Tesco saves millions with supply chain analytics, **http://www.information-age.com/technology/information-management/123456972/tesco-saves-millions-with-supply-chain-analytics#** (April 16, 2013)

[3] Boulenger, Stephanie, Abt Associates Inc., Yogesh Rajkotia, USAID, and Willa Pressman, USAID. July 2007. Building an equitable health system for Southern Sudan: Options for GAVI Health Systems Strengthening Funding. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.

[4] Tarantino, Lisa; Slavea Chankova, Elizabeth Preble, Josh Rosenfeld, and Subrata Routh. August 2011. Ukraine Health System Assessment 2011. Bethesda, MD: Health Systems 20/20 Project, Abt Associates Inc.

Think big, start small

The use of small data has long been the modus operandi in low- and middle-income countries. Characterized by a decentralized system of desktop files such as spreadsheets,[5] small data has largely become the information backbone as investments in enterprise systems continue to take shape. In public health and trade, order, procurement, and shipment transactions are often captured through a mishmash of paper documents, files, or if lucky, an occasional database. These data siloes have large repercussions on reliability and reinforce the misconception that analytics in this context is a lofty and impractical goal requiring significant investment.

Fortunately, analytics does not always entail the processing of terabyte- or petabyte-class data.[6] In fact, in many cases it's as simple as turning your mind to what the data can tell you. Quite often that's not big data.[7] The value of small data in the development space should not and cannot be overlooked. While local governments and private sector entities think big about long-term supply chain data strategies, there are apparent benefits to launching short-term, highly-concentrated efforts or "sprints" that inherently lead to supply chain improvements. The sooner a sprint is completed, the sooner one can identify price savings for a particular commodity, flag the under-performance of a carrier, or avoid an inventory stock out.

Rather than waiting years for a data warehouse investment, a logistics agency in Sub-Saharan Africa made immediate and considerable advances by employing a number of sprints to get its logistics data and performance in order. Transactional data from the enterprise resource planning (ERP) system was often missing or erroneous, resulting in the execution of numerous sprints to synthesize and cleanse customer orders. And given that a distribution module was not in place, another sprint was initiated to establish a low-burden tracking tool to manage shipment data. Within a year, the agency had implemented a series of small yet highly coordinated steps to amass over 1.3 million records of data — all of which was used to track and report on a set of 15 supply chain performance indicators. The result was a marked improvement from reliance on a questionable and disparate set of data to an integrated ecosystem of small data. This not only improved data reliability, but eased transition to much larger technology investments that lied ahead.

[5] Rufus Pollack, Forget Big Data, Small Data is the Real Revolution, **http://blog.okfn.org/2013/04/22/forget-big-data-small-data-is-the-real-revolution** (April 13, 2013)

[6] Guszcza, James; Steier, David; Lucker, John; Gopalkrishnan, Vivekanand; and Lewis, Harvey, Too Big to Ignore. When does big data provide big value?,Deloitte Review. Issue 12, 2013

[7] Booker, Ellie, Big Data Profile: Tim Phillipps, Deloitte Analytics, **http://www.informationweek.com/big-data/news/big-data-analytics/big-data-profile-tim-phillipps-deloitte-analytics/240162236** (October 4, 2013)

Employ visual advocacy

Comprehending and making use of supply chain information in developing countries is a complex endeavor. Aside from the fragmented data feeds of suppliers and customers, a plethora of data is typically generated by various profits and non-profits that often serve as third party logistics (3PL) providers to plan, procure, and deliver on behalf of a country. Interpreting this varying set of statistical reports and indicators, and communicating it in such a way that encourages action is a daunting task. Yet this is what local governments and international donors must accomplish in order to justify and finance sustainable development efforts.

Data visualization is a burgeoning area for the international development community, where it has been used to simplify data complexity while delivering impactful insight. Not too long ago, health professor Hans Rosling launched a movement to "change mindsets with datasets."[8] By visualizing data from the United States Agency for International Development (USAID) Demographic and Health Surveys program, he revealed uncommon insights into global health that captivated a global audience. Fast forward to today and one will find a number of similar initiatives, such as those of the World Bank whose interactive charts on economic trade indicators and geospatial mappings on gender inequality have made development data more accessible and consumable to the public. Similarly, visualization can help a developing country supply chain communicate insight, justify findings, motivate change, and sustain improvements for the long-term.

In Southern Africa, a commodity distributor historically relied on a "fast-track" procurement process with shorter cycle times than its traditional tendering model. While it enabled the organization to be more responsive to the needs of the country, it was unsustainable from an economic standpoint. Given the complexity of the tradeoff, the organization struggled to justify and enact reform. This quickly changed once they began visualizing their spend.

Data from various sources in varying formats was aggregated and visualized through an interactive set of treemaps, scatter plots, and heat maps. The resulting story was compelling and the impact was clear — over 30% in potential savings and ways to achieve it on a sustainable basis. Without spending an inordinate amount of time sifting through data or reports, senior leaders quickly arrived at a shared understanding and immediately authorized actions for change. Complex data that was not well understood had quickly shaped into a compelling voice of advocacy through data visualization.

Visualization in Development

Donor institutions, development banks, and non-governmental organizations are embracing data visualization as an effective tool for advocacy and analysis.

- World Bank's Data Visualizer is an online tool that displays and compares multiple data dimensions for hundreds of countries. Indicators are used to produce colorful and interactive models showing trends over time.

- Gapminder World is the brainchild of Hans Rosling, who set out to "unveil the beauty of statistical time series by converting [numbers] into enjoyable, animated, and interactive graphics."

- USAID's Geocenter serves as the agency's centralized function for Geographic Information Systems (GIS), enhancing international development efforts through use of spatial analysis and maps.

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[8] Rosling, Hans, Hans Rosling: Let my dataset change your mindset, **http://www.ted.com/talks/hans_rosling_at_state.html** (August 2009)

Get the requirements right

Distribution operations in the development sector are often charged with the responsibility of monitoring and evaluating supply chain performance. Data is collected, indicators such as *stock-outs* or *fill rates* are calculated, and information is ultimately communicated to donors, governments, and other partners - similar to how a company reports quarterly or annual performance to its investors. This information has traditionally been used to monitor performance, but can it inform strategies that drive sustainable development?

As noted by Darin McKeever, Deputy Director at the Bill & Melinda Gates Foundation, "[development sector data] may get aggregated into mineable datasets, but the work of turning this data into evidence - that is information which is helpful in forming a conclusion or hypothesis — involves something more."[9] In the context of a low- and middle-income country where a myriad of constituents, infrastructure constraints, and fragmented systems confound a supply chain, traditional performance indicators may not be sufficient to form the right conclusion.

Operational performance, country conditions, and geopolitical climate are all common requirements to making supply chain analytics effective in the development sector, but what is often lacking is the projected return on investment. For a supply chain, this means making top line or bottom line growth requirements front and center. In the private sector, this helps determine corporate viability in terms of revenue and cost. In a developing country, it becomes an indicator for future sustainability.

Take the case of a state corporation in East Africa that was looking to decentralize its distribution network to better serve over 4,000 public health facilities across the country. In the past, the organization initiated various studies to determine the required network configuration, but never had the confidence to justify such a decision. In 2012, they embarked on a new study with a new approach. This time, they incorporated value drivers such as distribution cost and service level, quantified constraints such as infrastructure and road conditions, and modeled legislative implications of the government's recent focus on devolution. The result was a more exacting and purposeful analytics exercise — one that pointed towards a new logistics footprint with a 2.1% reduction in annual operating costs and 45% increase in responsiveness. Clear evidence with conclusive results to make a developing country supply chain that much more sustainable.

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[9] McKeever, Darrin, Moving from Big Data to Big Wisdom, **http://www.forbes.com/sites/skollworldforum/2013/03/28/moving-from-big-data-to-big-wisdom** (March 28, 2013)

Conclusion

Applying analytics to the challenges in developing countries is a significant step towards sustainability. By working within local constraints to adapt practices, evidential insights can be drawn and effective decisions can be made. And given the magnitude and relevance of supply chain operations in the development sector, the resulting impact can be far-reaching.

Supply chain decisions affect more vital outcomes in low- and middle-income countries than one might realize. Demand forecasting and inventory planning influences the ability for national health systems to deliver life-saving drugs to its citizens. Logistics and distribution actions govern the prepositioning of food that is needed to address widespread hunger and malnutrition. Customs and transportation performance helps shape the economic growth and competitiveness of a nation. One can only imagine the sustainable impact that can be made if these decisions were informed by analytics.

For opportunities that hold the most promise, take the time to invest in a thoughtful strategy upfront and tactically adjust to unexpected constraints along the way. The results can be well worth the investment. In the development sector, analytics is not just about making smarter operational decisions, its about enabling a country's sustainability for the future.

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