



PUTTING DATA TO WORK

Maximizing the Value of Information in an Interconnected World



JUST THE FACTS

Data flows are the lifeblood of today's interconnected economy.

Cross-border data flows are as pervasive as the Internet itself, offering limitless opportunities for innovation, social benefit, growth and prosperity to businesses and their customers across the world.

These flows are essential to many recent business trends, including big data analytics, machine-to-machine communications, digital collaboration, supply chain automation, cloud computing, and delivery of enhanced products and services.

Cross-border data flows and the business trends that they enable generate enormous value globally.

1. More globally connected countries increase their gross domestic product (GDP) growth by up to 40 percent more than less connected countries.
2. Information and communications technology usage enables growth, particularly in emerging economies, by giving new and small businesses ready access to global service delivery platforms.
3. Removing trade barriers faced by digitally intensive firms would markedly increase GDP, wages, sales and employment.
4. Embracing cross-border data flows reduces physical trade barriers and reduces the impact of geographical isolation from major export markets.

Policymakers must adjust course.

Opportunities could be lost and the global economy put at risk if policymakers continue imposing overbroad restrictions on cross-border data flows.

Policymakers must chart a new course that embraces our interconnectedness, puts data to work and seeks more productive ways to give governments reasonable assurances while minimizing barriers to trade, promoting cross-border business investment and maximizing benefits for all stakeholders.



Business Roundtable CEO members lead companies with \$7.2 trillion in annual revenues and nearly 16 million employees. Business Roundtable member companies comprise more than a quarter of the total market capitalization of U.S. stock markets and invest \$190 billion annually in research and development — equal to 70 percent of U.S. private R&D spending. Our companies pay more than \$230 billion in dividends to shareholders and generate more than \$470 billion in sales for small and medium-sized businesses annually. Business Roundtable companies also make more than \$3 billion a year in charitable contributions.

Please visit us at www.brt.org, check us out on Facebook and LinkedIn, and follow us on Twitter.

Copyright © 2015 by Business Roundtable

Putting Data to Work

Maximizing the Value of Information
in an Interconnected World

Table of Contents

Executive Summary _____ 1

I. Introduction _____ 3

II. How Globally Connected Businesses Put Data Flows to Work _____ 5

III. How Governments Restrict Cross-Border Data Flows _____ 17

IV. Benefits We Could All Lose — or Work Together To Maximize _____ 25

V. Recommendations for Global Policymakers and Trade Negotiators _____ 33

VI. Our Call to Action _____ 35

Endnotes _____ 37

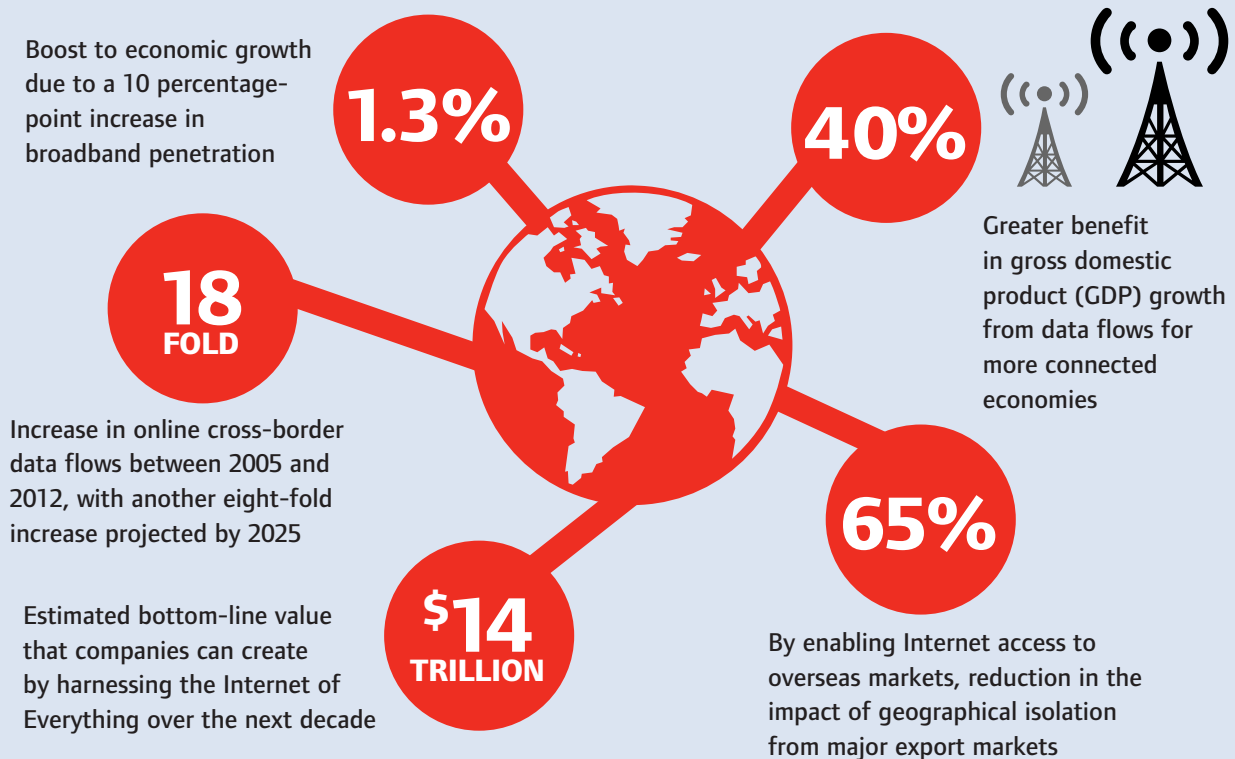
Executive Summary

- ▶ In today's global digital economy, businesses and manufacturers in every country and sector depend upon data flows to operate, deliver, grow, innovate and prosper.
- ▶ Cross-border data flows have become as pervasive as the Internet itself, connecting companies both large and small to business units, trading partners, workers and customers around the world.
- ▶ Laws and regulations that restrict the movement and use of data across national borders must be assessed to identify potentially far-reaching impacts and costs.
- ▶ Businesses and their customers — and governments and their citizens — can gain enormous benefits by embracing cross-border data flows, fully realizing opportunities for business innovation, economic growth, creation of new jobs and a myriad of social benefits.
- ▶ Policymakers should strive for trade agreements and laws that provide clarity, consistency and stability for all stakeholders involved in data flows, giving governments the reasonable assurances they seek while minimizing trade barriers, promoting cross-border business investment and maximizing economic benefits.

“Data powers the digital economy. Collaboration and openness are crucial to fueling global growth across borders and industries.”

— *Michael I. Roth, Chairman & CEO, The Interpublic Group of Companies*

GLOBAL BENEFITS OF CONNECTIVITY



HOW BUSINESSES PUT CROSS-BORDER DATA FLOWS TO WORK



M2M COMMUNICATIONS

1 trillion connected objects and devices will be generating data across the planet in 2015

SUPPLY-CHAIN AUTOMATION

1/2 of losses due to supply chain inefficiencies could be recaptured by tapping connected technologies



PRODUCT & SERVICE DELIVERY

2x was the annual growth rate for mobile app use in both 2012 and 2013 as businesses find new ways to reach customers via mobile technology

BACK-OFFICE CONSOLIDATION

20 percent boost in effectiveness is seen among organizations that pursue IT consolidation and shared services



DIGITAL COLLABORATION

80 percent of companies see a positive return on their investment in collaborative technologies — often after just 21–40 months

CLOUD SCALABILITY

85 percent of new software is now being built for the cloud



BIG DATA ANALYTICS

60 percent is the potential margin increase for retailers that use big data technology

I. Introduction

As CEOs of the world's largest multinational companies, Business Roundtable (BRT) members have a unique understanding of cross-border data flows and the pervasive role they play in globally connected businesses today.

In our increasingly digital world, few companies can operate without the ability to move data. Modern businesses and manufacturers, large and small, in every country and sector, now rely extensively upon these data flows to operate efficiently, deliver goods and services, and expand into new markets around the world. Networked technologies such as cloud and mobile are enabling a new age of innovation and efficiency fueled by data flows. Moreover, as global connectedness grows within and among companies linked together in value chains and with customers located around the world, data must flow freely between geographically distributed entities and across national borders.

However, putting data flows to work is what drives economic growth and innovation. Data delivers no value without the ability to access and use it effectively. Business data needs and opportunities cannot be realized without the ability to exchange data on a global scale.

Those nations that can find ways to embrace cross-border data flows stand to reap the greatest benefits from this global value chain.

Our BRT policy paper, *Promoting Economic Growth through Smart Global Information Technology Policy*,¹ examined one critical aspect of global information technology policy: government-imposed local data server requirements. Unfortunately, national laws and regulations that restrict data storage are but one facet of an alarming trend.

A myriad of new government initiatives that would impede cross-border data flows are now spreading across the globe. Emerging policies that restrict data content, storage, access and use may be rooted in reasonable privacy and security concerns. But as this trend escalates, these policies are doing more harm than good by creating uncertainty, sapping productivity, stifling innovation, creating barriers to trade and discouraging foreign investment in the countries proposing them.

We believe that enhanced understanding of cross-border data flows can help all stakeholders address their concerns and prosper together.

To foster mutual understanding, BRT members have contributed our own experiences to this paper. First, we illustrate the breadth and depth of data flows among globally connected companies everywhere and our business units, trading partners, workers and customers worldwide. Then we analyze data-based business trends and the enormous value being generated through cross-border data flows; growing government restrictions; and potential consequences, costs and lost opportunities that result from overly broad restrictions. Finally, we recommend approaches that global policymakers and trade negotiators can use to recognize and manage risks while maximizing potential benefits for all.

II. How Globally Connected Businesses Put Data Flows to Work

Skyrocketing global Internet connectivity and digital technologies have transformed the way that modern companies in every country and industry conduct business.

Today, roughly 3 billion people — nearly 39 percent of the world’s population — are connected to the Internet.² Over the next decade, the Pew Research Internet Project predicts that the Internet will “be so effortlessly interwoven into daily life that it will become invisible” — as essential and ubiquitous as oxygen.³ Moreover, connectivity is rising even faster in emerging economies, bridging vast distances to give consumers everywhere greater access to goods and services that enrich their lives — and helping companies of all sizes everywhere reach new trading partners and foreign investors.

This tidal wave of connectedness has fueled a corresponding rise in new digital technologies, together driving an 18-fold increase in cross-border Internet traffic between 2005 and 2012.⁴ Furthermore, this growth reflects an expanding worldwide economy, with emerging markets tripling their share of global flows.⁵ Clearly, moving business data across national borders is no longer the exception. Cross-border flows now serve as a mission-critical foundation for globally connected businesses, a prerequisite for global digital trade, and a launch pad for innovation and entrepreneurship.

In fact, data flows have become such an indispensable business resource that globally connected companies large and small — and consumers everywhere — find it difficult to even imagine operating without them. In today’s digital economy, blocking commercial data movement is akin to choking off an individual’s air flow — immediately disabling and ultimately life threatening.

To illustrate, let’s look at how Business Roundtable (BRT) members and our trading partners and customers around the world are putting cross-border data flows to work, using them to pursue game-changing innovations such as Internet-connected machinery and data analytics, streamline back-office functions, take advantage of operating efficiencies and economies of scale, facilitate collaboration, and deliver enhanced and individually optimized products and services to customers everywhere that benefit not only the global economy but also our shared planet.

Internet-Connected Machinery

Increasingly, manufacturers of nearly every kind of machine — from pacemakers and aircraft to home appliances and manufacturing production equipment — are leveraging Internet connectivity to optimize efficiency and customer experience. This so-called Internet of Everything (IoE) is growing rapidly, with machine-generated data contributing to a projected 50-fold increase in Internet traffic between 2010 and 2020.⁶ Today, AT&T’s global network alone supports more than 17 million machine-to-machine (M2M) connections.⁷ IBM projects that there will be 1 trillion connected

“Internet-connected machinery from Caterpillar harnesses the power of data to deliver better fuel efficiency and productivity to our customers, allowing them to leave a smaller environmental footprint. It’s important to the world, it’s important to our customers, and it’s important to us.”

— Douglas Oberhelman, Chairman & CEO, Caterpillar Inc.

objects and devices on the planet generating data in 2015.⁸ By 2020, machine connections are expected to generate \$373 billion in network revenue.⁹

Moreover, Internet connectivity is fostering an explosion of “smart” products. Not only do network operators in every country earn recurring revenue from connected machines, but their customers also reap even greater benefit by offering connected services. For example:

- ▶ The manufacturing and supply chain sector, historically run on very tight margins, is leveraging M2M technology to reduce waste and consumption of fuel, remotely tap into otherwise inaccessible assets, and achieve operational efficiency savings.¹⁰
- ▶ Heavy equipment manufacturers can now collect operating metrics from products worldwide to optimize the performance of each customer’s fleet.
- ▶ Energy producers can deploy turbines and generators that are monitored 24/7 for early signs of trouble, reducing the power outages that so often impede economic development in emerging markets.

Caterpillar Inc.

DRIVING FLEET PRODUCTIVITY FORWARD

Caterpillar is a leading manufacturer of machinery and engines that are used across scores of industries, from construction and mining to heavy-duty transportation. Caterpillar’s Product Link™ fleet management solution leverages machine-to-machine (M2M) technologies to increase its customers’ fleet productivity and performance while lowering operating costs. Sensor-enabled machines transmit performance and terrain information via cell and satellite signals to centers where data can be analyzed, enabling Caterpillar and its customers to remotely monitor assets across their fleets in real time.

The ability to compare equipment productivity and utilization across machines allows Caterpillar’s customers to identify underutilized machines and make better equipment placement decisions. Reducing machine idle time maximizes efficiency and can create enormous cost savings for customers. For example, Product Link™ remote monitoring allowed one saw mill to decrease the idle time of its wheel loaders from 45 percent to less than 30 percent per shift.¹¹ Reduced idle time improves fuel efficiency and extends warranty coverage and periods between required maintenance appointments, all of which save on the bottom line.

Product Link™ GPS functionality also allows fleet managers to easily examine the performance of a single machine or at a specific worksite over time. Customers can designate worksite boundaries for specific machines and receive alerts from Caterpillar for unauthorized use of equipment, improving worksite security. Geolocation data also enables Caterpillar and its customers to diagnose the cause of performance issues when things go wrong. For example, truck data at one worksite showed Caterpillar that some operators were not using the correct brake procedures on a haul road with a very steep incline. Retraining the operators on best practices saved the customer about \$12,000 on the project, and companywide driver incidents decreased by 75 percent.¹²

Caterpillar has built a global reputation for quality products that keep customers working and help them be more profitable. However, cross-border data flow restrictions can limit Caterpillar’s ability to offer these services in certain markets. In particular, regulatory constraints can prevent the movement of GPS data across borders. For example, restrictions that mandate that location data be hosted in-country require redundant investments in new data centers and country-specific procedures. Through these added costs, laws that trap data end up hurting customers in the countries that impose them when Caterpillar is forced to pass on to customers the higher costs of providing the services or when the laws prevent Caterpillar from providing services that have proven to save customers money. Such laws also isolate equipment data from countries that impose them, preventing Caterpillar from drawing and sharing broader insights about machine or industry performance that can benefit customers globally.

- ▶ Municipalities such as Doha, São Paulo and Beijing have all used “smart” water systems to reduce leaks by 40–50 percent.¹³
- ▶ Doctors are now using “smart” pacemakers and other medical devices that send alerts to trigger rapid response to emergent crises, improving health care and saving lives.



Worldwide, the potential value at stake in IoT initiatives over the next decade is staggering: \$106 billion in connected health care and patient monitoring, \$347 billion in connected commercial ground vehicles that automate navigation and path optimization, and nearly \$2 trillion in “smart” factories that leverage connectivity to cut production and supply chain costs.¹⁴ IoT initiatives are enabled by increasingly pervasive connectivity, fueled by telecommunications investment. For example, between 2007 and 2014, the estimated number of active mobile broadband subscriptions per 100 people spiked from 4.0 to 32.0 worldwide.¹⁵

M2M also is driving new partnerships among manufacturers and service providers to better integrate connectivity into machinery used across industries, enabling sustainability, safety and monitoring of equipment in remote locations. For example, Verizon and GE are partnering to connect GE’s software-enabled machines and devices using Verizon’s M2M connectivity and cloud platforms, creating a secure wireless communications system for the industrial Internet.¹⁶

Such products are just the tip of the iceberg, as ubiquitous Internet connectivity makes it possible to remotely optimize nearly every machine found in factories, offices, schools and homes. This value chain is extensive; for example, the number of developers producing IoT software will engage 10 percent of all software developers by 2019.¹⁷ Verizon predicts that adoption of IoT technologies and services will rise in 2015, particularly within small and medium-sized enterprises (SMEs) and larger organizations that were not early adopters, creating a foundation for successful business growth.¹⁸ By 2025, IoT will contribute between \$2.7 trillion and \$6.2 trillion to the world economy.¹⁹

However, many IoT innovations would be crippled without cross-border data flows. Internet-enabled medical service delivery cannot realistically pause when patients travel abroad. Flight data gathered from aircraft traveling at 500 knots cannot ebb and flow based upon geographic location. Industrial equipment and “smart” appliances should not be forced by national laws to operate less robustly when used in some countries. And yet, these are the risks that our businesses, trading partners and customers face from laws that broadly constrain the flow or use of data from Internet-connected machines. Restrictions on cross-border data flows cause fragmentation and complexity that significantly complicate rather than simplify M2M deployment.

Big Data Analytics

From consumer goods manufacturers and retailers to energy producers and advertisers, a growing number of companies across the globe now rely upon big data analytics to work smarter and better satisfy their customers.

Big data analytics involve examining very large data sets to uncover patterns, correlations and insights, helping both businesses and their customers make better decisions. Today, 80 percent of the world's data is unstructured (e.g., sensor data, audio and video, social media), creating new data to mine for insights.²⁰ The International Data Corporation (IDC) expects the overall big data and analytics market to reach \$125 billion worldwide in 2015.²¹ By applying these new techniques to information collected from products and customers worldwide, multinational businesses can better understand consumer desires, supply chain needs and more, optimizing processes and customizing services to deliver greater value.

For example, in manufacturing, process data can be analyzed to optimize yield. According to McKinsey & Company, manufacturers in a range of industries and geographies have an abundance of real-time shop-floor data that could be used to drive this analysis. For example, one biopharmaceuticals manufacturer significantly increased vaccine production by gathering far-flung process data into a central database for analysis. By making targeted process changes, that manufacturer increased vaccine yield by more than 50 percent — worth between \$5 million and \$10 million in yearly savings.²²

IBM Corporation USING DATA TO DRIVE INNOVATION AND TRANSFORMATION

IBM is a globally integrated enterprise, operating in more than 170 countries and providing leading-edge information technology (IT) solutions, services and cognitive computing. Given today's convergence of big data, cloud computing, mobile technology and social business, IBM is now executing a bold agenda, using data to transform global industries, professions and society.

To help clients across the globe extract value from the 2.5 billion gigabytes of data now generated each day, IBM has invested \$24 billion to build its big data and analytics capabilities.²³ With IBM's help, clients can use this abundance of structured and unstructured data to develop insights, enable data-driven innovation and transform their businesses. This capability includes applying a range of analytics, including descriptive, predictive and prescriptive analytics, to mine big data. In a world where competitive advantage can be lost or won in fractions of a second, the value that companies in every country can glean from the timely mining of their data is extraordinary.

IBM makes these investments because it sees big data as the world's new natural resource, benefiting global networks of consumers, workers, citizens and students. Deriving the greatest benefit from this resource, however, requires the ability to collect and analyze data from global operations. IBM's increasingly global clientele (40,000 engagements around the world) can leverage the disparate data generated by the clients' worldwide ecosystems as the new basis for comparative advantage. For example, clients that sell consumer goods around the world can employ IBM's sophisticated analytics to derive insights about their customers and their product markets on a global scale and apply these insights to drive profitable growth.

The ability for businesses around the world to harness the transformative power of this natural resource is what will continue to drive innovation. Accomplishing this, however, is contingent on being able to move data across national borders. The ability for globally connected businesses to derive value from big data could be compromised by restrictions that prevent the aggregation of data on a global basis and limit the application of analytics to a series of country-by-country data sets. These restrictions have the potential to severely limit forward progress by denying businesses, governments and consumers in affected countries the competitive advantages that would otherwise be available through leveraging the full array of analytics and other data-driven innovative services.

Similarly, advertisers have long measured past marketing campaign effectiveness to predict future results. Today, digital marketing is increasingly accomplished through programmatic campaigns that use big data-driven automation to customize ads presented to consumers via video, mobile, social networks and even Internet-connected TVs. These programmatic ads are so much more effective that two-thirds of marketers plan to spend at least 40 percent of their digital marketing budgets programmatically this year, while a quarter plan to spend at least 80 percent this way.²⁴

In fact, many of the “free” cloud and mobile apps that consumers around the world now enjoy are financially supported by programmatic ads. These ads are most beneficial for both consumer and advertiser when big data insights can be used to deliver more relevant, timely content, placing the right ad in front of the right person at the right time. These and other connected marketing and advertising techniques could add \$1.95 trillion to the global economy over the next decade, transforming the way that companies engage with their customers.²⁵

The public sector and other industries such as insurance, health care and banking also have much to gain from big data. For example, big data analytics are driving personalized health care, helping doctors use genetic profiling to find the most effective treatment for each individual. McKinsey estimates that European government administrations could use big data to save more than \$149 billion in efficiency improvements.²⁶ One South African insurer (Santam) used analytics to reduce fraud and process claims 70 times faster, saving \$2.4 million in just four months.²⁷ Another manufacturer (Xerox) used analytics to better match candidates to jobs, cutting call center employee attrition by nearly one-fifth.²⁸

Overall, businesses that have harnessed big data have been seen to increase their operating margins by 60 percent.²⁹ In a 2014 survey, 43 percent of European business leaders said that at least 10 percent of their companies’ growth over the next five years will be tied to analytics. Additionally, 58 percent and 72 percent of respondents said that they expect big data analytics to play an important role in hiring and creating new products and services, respectively.³⁰

“Data is the world’s new natural resource. IBM believes that data promises to be for the 21st century what steam power was for the 18th, electricity for the 19th and hydrocarbons for the 20th.”

— Virginia M. Rometty, Chairman & CEO, IBM Corporation

However, big data analytics are effective only when based upon very large volumes of information that reflect populations served, such as anonymized consumer purchase data. The tremendous promise of big data analytics will be nipped in the bud if data flow restrictions are permitted to isolate entire nations of consumers, leaving providers blind to insights that could otherwise be used to enhance goods and services delivered to those citizens.

Back-Office Consolidation

Throughout the world, organizations of every kind — from multinational retailers and payment processors to government offices and information technology (IT) manufacturers — are taking steps to reduce waste and streamline operations through back-office consolidation. As organizations grow, whether through acquisition or expansion, internal business functions are often replicated at local levels, resulting in duplicated and misaligned activities that sap profitability.

In difficult times, employers sometimes seek immediate savings through layoffs, but more forward-thinking companies achieve longer-lasting business transformation by consolidating key back-office functions. According

to McKinsey, organizations that pursue a strategy of IT consolidation and shared services can boost their effectiveness while cutting costs by up to 20 percent — *without cutting jobs*.³¹

Eliminating wasteful overlap, improving buying power, leveraging economies of scale, harnessing best practices and creating greater opportunity for investment are just a few of the many economic drivers that lead businesses to consolidate nonmarket-facing activities in centralized location(s).

Functions such as purchasing, accounting, payroll, human resources (HR), benefits and call centers can often be performed more efficiently and consistently by specialists, providing shared services to business units and employees everywhere. Moreover, consolidated back-office systems provide large distributed organizations with a global view of their assets, talent and processes.

For example, large companies across the world — from Unilever,³² Royal Dutch Shell³³ and Tencent³⁴ to IBM and Walmart — are consolidating HR systems to affordably deliver consistently high-quality service to their employees worldwide. Consolidating HR data helps employers align processes and roles, match remote employees with opportunities for advancement, reduce costly redundancies, and analyze key metrics globally to detect anomalies and predict future hiring needs. Moreover, companies that grow through acquisition often inherit a patchwork of HR systems; moving to a global HR service delivery model not only reduces cost but also enables

Walmart

BRINGING VALUE TO CUSTOMERS AND COMMUNITIES AROUND THE GLOBE

As the world's largest retailer, Walmart operates more than 11,000 stores in 27 countries, maintains e-commerce websites in 10 countries and employs 2.2 million associates worldwide. To track its performance and operations throughout the world, Walmart must collect data on numerous aspects of its business. Due to the way that the company has historically grown through acquisition of retail operations across the globe, Walmart International retail units often maintain and store data locally. The more recent trend, however, has been to centralize data and use shared services.

For example, Walmart is in the process of building a more consistent human resources (HR) delivery model, which will align processes, roles and data management platforms in all markets. This alignment will simplify Walmart's technology landscape, remove complexities that arise from using multiple platforms across individual markets and support the use of innovative technology such as cloud-based HR platforms. This alignment also will facilitate future back-office consolidation across markets to reduce the costly duplication of hardware and software and to increase operating efficiency through economies of scale.

Consolidation will also enhance Walmart's ability to analyze and leverage the HR data it collects, giving the company a global view of its talent distribution, reducing manual effort and enhancing its ability to quickly put resources to work in new markets. Walmart will also be able to perform cross-market data comparisons to identify and disseminate global best practices for allocating human resources. Finally, consolidating HR data will help reduce inconsistency of information and, with it, the risks of not installing the best talent or hiring the best people for individual roles.

Data flow restrictions could impede these forward-thinking Walmart innovations, slowing or preventing the adoption of efficiency-enhancing and cost-saving global shared services. Restrictions could also force redundant or otherwise unnecessary capital investments, such as the construction of new data centers. While such investments could yield direct benefits to local economies in the short run by supporting a very small number of local jobs, the benefits will likely be greatly outweighed by negative indirect effects in the long run. These negative effects include discouraging much larger job-creating investments in other areas of the business that would help Walmart better serve its customers. Ultimately, such restrictions hurt any multinational retailer's ability to deliver affordable goods to customers in markets that impose them.

more reliably available, consistently secure access to the financial and personnel data required to issue paychecks. For example, IBM's shift toward global integration of internal functions, including HR functions, generated more than \$6 billion in productivity savings for the company from 2005 to 2010.³⁵

However, for multinational companies, benefits gained through back-office consolidation depend heavily upon moving and using data across national borders. The ability to hire, pay and administer benefits to foreign workers could be impeded by laws preventing the use of shared services to meet these back-office needs. Especially in markets where operating margins are thin, even the risk of laws that require back-office redundancy can be a significant disincentive to foreign investment.

Supply Chain Automation

Businesses in many sectors must carefully manage supply chain activities to track inventory, match supply with demand, take full advantage of buying power and volume discounts, and optimize future performance. But for large multinational companies, supply chain management (SCM) can be tremendously challenging and expensive. For example, McKinsey estimates that retailers lose the equivalent of 4 percent of annual sales by failing to stock items that consumers wish to purchase.³⁶ However, tapping connected technologies to automate SCM could recapture up to 50 percent of the value otherwise lost to inefficiencies. "Smart" factories that leverage IoE to cut production and supply chain costs could save nearly \$2 trillion over the next 10 years.³⁷

For example, before IBM consolidated its own global SCM, regional procurement offices operated independently. Centralizing and automating SCM allowed IBM to achieve great economies of scale. Moreover, IBM's Global Business Services SCM team works with its customers to improve their own supply chain designs, optimizing supply chain networks and inventory levels, improving vehicle routing and planning, and promoting more efficient production scheduling.³⁸ Such optimizations can help manufacturers in any industry or country operate more efficiently, driving business growth and demand for supplies while delivering more timely goods of greater value to customers.

However, supply chain participants in countries that inhibit cross-border data flows are at a competitive disadvantage, unable to participate as fully or effectively in global supply chains. For example, companies everywhere commonly rely upon electronic purchase order (PO) processing; such orders often contain contact names and addresses. Broad laws that may be interpreted as mandating in-country storage of all locally generated POs or requiring personal data protection for PO contact details discourage multinational companies from procuring supplies from manufacturers in those countries. BRT companies report similar uncertainty around contact details for local movers and delivery truck drivers; such challenges can also serve as a disincentive to foreign investment in those countries.

Ultimately, such barriers can degrade the benefits achievable through SCM automation and limit the cost-effective procurement, fulfillment and delivery options available to meet supply chain needs. Where data cannot flow across borders, supply chain flows are similarly impeded, resulting in delayed product deliveries and higher prices for consumers everywhere.

Digital Collaboration

Internet connectivity, mobile devices and cloud technology are also being combined to enable digital collaboration within far-flung user communities, creating platforms and tools that make it easy to share knowledge, content and work in progress without constraint by place or time.

Through digital collaboration, distant business partners and employees are no longer isolated, forced to duplicate data and work independently. Instead, digital assets can reside on cloud-based collaborative platform(s) that are readily accessible to all, letting geographically distributed teams work together more efficiently and effectively.

According to Forrester Research, adoption of cloud-delivered collaboration services, including voice-, web- and videoconferencing and sharing of information relevant to business processes, will grow by an average of 14 percent per year through 2018.³⁹ Nearly 80 percent of companies see a positive return on their investment in collaborative technologies — often after just 21–40 months.⁴⁰ Companies that deploy more advanced tools and

The Interpublic Group of Companies USING GLOBAL SOLUTIONS TO TARGET THE RIGHT PRODUCTS TO THE RIGHT AUDIENCE

Interpublic Group (IPG) is a global leader in modern marketing and advertising services, with more than 80 operating units and 47,000 employees in all major world markets. IPG is home to communications companies that provide consumer advertising, digital marketing, sports and entertainment marketing, public relations, and media services to many of the world's largest marketers. IPG Mediabrands, a division of the company, manages media strategy and placement services on behalf of clients, investing \$37 billion in global media in more than 120 countries.

IPG Mediabrands relies on the free flow of data to identify advertising targets and media buys, develops the means by which to reach those targets, and evaluates the success of advertising campaigns on behalf of its clients. IPG agencies work with clients around the world to evaluate and refine their global digital marketing and advertising campaigns by aggregating behavioral and demographic consumer information through regional processing centers. By collecting performance metrics like the number of ad views and clicks, as well as social media presence (e.g., Tweets, Facebook posts, blogs, Tumblr feeds, LinkedIn profiles), IPG agencies help their clients optimize and personalize the website advertisements shown to consumers across the world.

Aggregated data from in-market campaigns can be shared with the chief marketing officers of IPG clients through a dashboard tool, elements of which can also be shared in real time with key constituents — creative agency teams, client brand teams and media partners — around the globe. The ability to share data across borders helps IPG agencies and their clients optimize media investment by delivering ads of greater relevance to consumers. This stream of electronic data and the ability to analyze the data represent a new opportunity for marketers to target campaigns more efficiently.

IPG's global agencies and clients, however, are increasingly facing complications related to local regulations that govern how data should be managed from market to market. Market-specific restrictions on the use, storage, censorship and flow of critical information could pose complex challenges to the analytics activities used to maximize the value delivered to every party involved in the advertising chain.

New privacy rules related to collecting data from digital advertising feeds pose potential threats to every marketer's ability to deliver effective, efficient and relevant messages to individual consumers. These rules can hamper the ability to formulate and report data to clients about the efficacy of their media strategies, thereby reducing the value of digital marketing to companies that sell products in countries that impose such restrictions. This in turn reduces the digital ad revenues that marketing and Internet companies in those countries can earn, ultimately discouraging investment in new or improved services provided to clients and Internet users in those countries. In this way, such regulations can stifle innovation to the detriment of all parties involved.

foster a collaborative culture enjoy greater benefits, with basic collaborators experiencing a 2.8 percent increase in productivity, while advanced collaborators reap more than double that benefit.⁴¹

For example, The Interpublic Group of Companies (IPG) — a global advertising holding company composed of more than 80 operating units around the world — employs digital collaboration technology to interconnect its agencies, suppliers and customers. By providing tools for easy, secure sharing of advertising campaign designs, creative assets and public relations material, collaborative teams can work together yet be spread across the globe. A marketing campaign may be conceived in New York or London, be sent to print in India, have video produced in Chile, and then be launched simultaneously on three continents, delivering results to a brand owner in Ireland — with digital assets moving easily between these collaborators. Digital collaboration allows IPG to make the best use of available talent everywhere, overcoming traditional distance and time barriers.

This kind of seamless, secure global collaboration simply would not be possible without cross-border data flows. The business benefits that could be lost are staggering. According to IDC, challenges around creating and managing content cost employers an average of \$9,000 per information worker, reducing total productivity by 9.8 percent.⁴² Even degraded data flows could have significant impact, as awkward collaborative processes sap total productivity by 11.5 percent. Would-be collaborators in less-developed nations could be unable to communicate effectively with potential trading partners, missing out entirely on many new business opportunities. In the era of digital collaboration, being cut off from data flows is the equivalent of being rendered deaf and blind.

“Today, The Interpublic Group’s greatest opportunity for marketing communications is the ability to leverage data to deliver more relevant and creative messages to consumers and to do it more efficiently and effectively for our clients.”

*— Michael I. Roth, Chairman & CEO,
The Interpublic Group of Companies*

Cloud Scalability

Many other transformative information technologies build upon the cloud. This ultimate game-changer comes in many shapes and sizes, from infrastructure to platform to software as a service. All provide cloud customers everywhere with on-demand Internet access to shared networks, servers, storage or applications, carved into scalable virtual resources that can be instantly provisioned and released.

Modern businesses find cloud benefits so compelling that more than 60 percent of the world’s server workloads now take place on cloud servers, up from 8 percent five years ago.⁴³ Today, 85 percent of new software is being built for the cloud.⁴⁴ According to a study by Verizon, 71 percent of global businesses expect to have external-facing production applications in the cloud by 2017.⁴⁵ Moreover, cloud is a truly global growing phenomenon, with worldwide enterprise spending on cloud services projected to triple between 2011 and 2017.⁴⁶

Among the benefits:

- ▶ Cloud reduces capital investment in idle capacity. For example, one European government used cloud technology to consolidate its servers to save an estimated 20–30 percent annually.⁴⁷
- ▶ Cloud lowers the total cost of ownership through economies of scale. For example, one report estimated that small businesses in Mexico save on average 67 percent of their total IT expenses by transitioning to Office 365.⁴⁸

- Cloud increases business agility by enabling rapid activation and better access to advanced technology. By lowering initial entry costs for new products and businesses, cloud annual economic benefits in France, Germany, Italy, Spain and the United Kingdom could reach more than €177 billion annually by 2015, creating 445,000 net new jobs.⁴⁹
- Cloud delivers greater resilience to failure and opportunities for all customers to leverage provider investment. For example, one multinational BRT member company saved \$1.5 million through data center consolidation but achieved even greater benefits from cloud, including better backup, fewer points of failure and reduced breach risk. In one study, enterprise cloud customers rated availability (84 percent) and performance (70 percent) as very important factors in evaluating cloud use.⁵⁰
- Finally, cloud can deliver the massive scalability needed to store and process big data at a fraction of the cost. One BRT member company found that a database query that once took 21 days at a cost of \$150,000 on one platform can now run on a cloud cluster in just one hour at \$900.

Microsoft

ENABLING GLOBAL BUSINESS IN A MOBILE-FIRST, CLOUD-FIRST WORLD

Microsoft is a multinational corporation that develops, manufactures, licenses, sells and supports computer software, devices and services to customers across the globe. With subsidiaries in 144 countries and more than 400,000 partners worldwide, Microsoft helps organizations of all sizes leverage the power of the cloud to serve customers more effectively, innovate more quickly and efficiently, and transform their businesses to take advantage of the Internet and online data.

Microsoft offers more than 200 cloud services, including Windows Azure, a platform and infrastructure service for cloud computing, and Office 365, an online version of the Microsoft Office productivity suite. More than 1 billion customers and 20 million businesses in 90 markets use Microsoft's cloud services to collect, store and protect their information (text, sound, software, images, etc.) in all stages (at rest, in transit and in use) across a global network of Microsoft data centers. Customers use these services in an almost infinite variety of innovative ways, from engaging in cutting-edge research and data analysis to developing and hosting new mobile apps to launching new online businesses. Microsoft is also an industry leader in adopting robust cloud security and privacy practices and in supporting responsible practices by cloud security vendors.

Cloud technology provides enormous benefits to Microsoft's customers. It allows them to run applications across multiple platforms (desktop computers, mobile devices, etc.) and scale their information technology (IT) capacity up or down almost instantaneously to fit their needs, without having to invest in additional IT infrastructure. Leveraging economies of scale through cloud computing also allows Microsoft to provide superior security and resiliency against hardware failure than companies could ever achieve by running their own data centers and at a fraction of the cost. Microsoft's cloud services create new opportunities by making it possible for even small and start-up companies to take advantage of the same world-class computing power and resources that previously were available only to the largest companies. Cloud computing also generates efficiencies by reducing overall infrastructure costs and energy use, resulting in significant cost savings — organizations often pay a third of the cost for cloud-based services versus what they would pay to own and maintain their own servers.⁵¹

Embracing cloud technology is a prerequisite to being competitive in the 21st century global economy.⁵² Indeed, as cloud technologies continue to advance, organizations and governments that embrace them will be better positioned to thrive. In contrast, governments that restrict how or where companies or their customers can store, transfer or access their data will deprive them of the full benefits of cloud computing and put them at a disadvantage in the global marketplace. Instead, by actively removing barriers to cross-border data flows, such as mandates for in-country data centers or data storage, governments can support productivity gains among local companies and consumers that embrace the power of cloud computing.

A study by the University of California San Diego concluded that “[t]he cloud is central to being competitive in higher value-added products because both goods and services in the world economy are becoming more [information and communications technology (ICT)] intensive. The cloud can allow emerging economies to tap the economic gains from the move to globalization of the design, production, distribution and support of goods and services over the last 30 years, and its growing ICT intensity.”⁵³ However, such global benefits cannot be achieved by an isolated cloud limiting data flows to a single country.



IT-Enhanced Product and Service Delivery

According to research by McKinsey, IT continues to transform business, making it possible for companies everywhere to leverage faster processors, greater capacity and more advanced software to “create new sources of value—new products, new ways of touching customers, and new tools for improving operating efficiency” with great potential to disrupt markets and “shift value to consumers.”⁵⁴

The opportunities for IT enhancement to foster social and economic growth are astounding. For example, as IT-enabled customs administration and trade optimizations are used to improve international commerce and trade logistics, global gross domestic product (GDP) could grow up to \$2.6 trillion — 6.5 times the benefit of eliminating all tariffs worldwide.⁵⁵ At an individual level, McKinsey estimates that mobile Internet applications could generate economic value of \$2–5 trillion annually, nearly half from developing economies where “millions of people will leapfrog from little contact with the wider world to owning a mobile device that connects them with the global digital economy.”⁵⁶

“Our global economy operates at its best when companies and organizations can easily work across borders. The true opportunity to grow and prosper comes with the secure transmission and exchange of data across geographies.”

— Ajay Banga, President & CEO, MasterCard

BRT members in every sector of the global economy continually strive to harness the power of IT, bringing innovative products and services to market to benefit our customers and shareholders. However, delivering IT-enhanced goods on a global scale hinges upon the ability to freely move and use data across national borders.

- ▶ Companies across the world are using IT-enabled help desks to enhance customer care. By creating regional centers of excellence in well-chosen locations, companies can consolidate sophisticated capabilities and skills, leveraging them to more efficiently and effectively serve customers everywhere, 24/7. However, laws that inhibit remote access to customer records and systems could delay or even prevent trouble resolution.
- ▶ Increasingly, businesses large and small are tapping social media, mobile applications and “crowdsourcing” to enhance customer experience. For example, the Truth App — an ethnographic research tool developed by McCann Truth Central — lets volunteers participate in market research by uploading their own photos and videos and responding to questions. Although volunteers enjoy sharing their views and insights gathered this way can greatly benefit others, diverse data protection laws around the world create costly barriers for any such application.

MasterCard

ENABLING GLOBAL ECONOMIC GROWTH THROUGH PAYMENT PROCESSING

MasterCard is a global payments industry leader that connects consumers, financial institutions, merchants, governments and businesses through electronic payments, using technology and data-driven insights to make electronic payments more convenient, secure and efficient for people everywhere. Today, the company processes payment transactions initiated at more than 40 million locations in more than 210 countries and territories.

Global payment services depend on the efficient management and movement of large volumes of data, often crossing national borders. Each payment transaction requires transfers of payment transaction data among the merchant, the merchant's bank, MasterCard and the consumer's bank. When the merchant, consumer and either of their banks are located in different countries, the transaction inherently depends on cross-border data flows. Such transactions are processed through MasterCard's global operations hub, the MasterCard Worldwide Network, which enables cardholders of any nationality to use MasterCard cards and other innovative payment devices to purchase goods and services from merchants in nearly every country. In this way, MasterCard enables merchants to engage in international trade or sell goods and services to foreign travelers. Even when the merchant, the consumer and their banks are all based in the same country, MasterCard may leverage its global operations hub to add value to the transaction and facilitate safe, efficient and cost-effective transactions. Like any network business, MasterCard's global network enables MasterCard to offer the investments and innovations that maintain and enhance the capabilities and protections afforded by its payment network to domestic payments around the world. Ultimately, the flexibility to move data across borders and process payments at global operations centers facilitates affordable, convenient access to goods and services by local merchants and consumers.

Nevertheless, some countries impose restrictions that require local processing of all electronic payment transactions. In doing so, restrictions can force the building or replication of costly infrastructure domestically as a means of maintaining operational control and data within the country. However, domestic infrastructure often insufficiently addresses the demands of today's electronic payments ecosystem. Such restrictions may therefore prevent global payment processors like MasterCard from offering services, which can force local merchants and consumers to use riskier, less efficient and less convenient forms of payment, such as cash. Alternatively, by forcing electronic payment processors to replicate infrastructure in-country, such restrictions drive up merchant costs and product prices. In the process, the desired purpose of the restrictions — data security — could be undercut, as the valuable security expertise and insights used to spot fraudulent activity and safeguard transactions processed at global and regional operations centers could be difficult to reproduce as effectively in many smaller, isolated locations.

Finally, MasterCard and other companies in the industry continue making transactions safer, more convenient, and ultimately more valuable to both consumers and merchants, with innovations such as contactless payments and electronic wallets. Data flow restrictions could limit or prevent access to these innovative technologies by customers in countries where those restrictions are imposed. By enabling access to global payment systems, countries can accelerate the progression of productivity-enhancing technologies that bring revenue and benefits to local merchants and consumers.

- ▶ Global payment networks have played a pivotal role in the growth of e-commerce. For example, the MasterCard Worldwide Network processes transactions in more than 150 currencies, letting merchants around the world accept point-of-sale, online and mobile payments. However, this business model is predicated on the global flow of data, economies of scale and other benefits of sophisticated centralized data processing services, such as effective fraud detection. Restrictions on cross-border transmission of payment-related information — including localization requirements — could harm national economies by reducing local merchant access to cost-effective, trustworthy payment processing options.

III. How Governments Restrict Cross-Border Data Flows

Globally connected digital technologies such as these have created the most profound platform for worldwide commerce in history. But more and more, BRT members are experiencing a dangerous trend as we conduct business around the world. A growing number of governments are erecting barriers to modern business activities by drafting new laws and regulations that limit the storage, movement and use of data across national borders — especially in emerging markets.

Many proposed restrictions are well intentioned, driven by government desires to protect private citizens or national security. Others are rooted in protectionism, intended to benefit key domestic industries.

But far too often, we are encountering new restrictions that are counterproductive, endangering cross-border data flows in pervasive ways that can degrade or even defeat policymaker objectives.

For example, national laws and industry regulations intended to foster local economic development often mandate business use of locally provided services, locally generated content or locally manufactured equipment. But in this digital age, localization requirements such as these can prevent businesses and governments — both foreign and domestic — from realizing the many economic benefits derived from secure use of IT. These types of



impacts can be seen in BRT member company examples given throughout this paper, illustrating how restrictions can inhibit or even prevent use of cloud services, Internet-connected machines or content produced through online collaboration with trading partners to the detriment of the countries imposing the barrier and of their consumers.

If these risks are not taken into consideration and minimized through carefully crafted trade agreements and more narrowly framed, goal-focused laws and regulations, businesses may be forced to reduce trade with and new investment in those countries, thereby *depressing local economic development*. This risk is elevated in developing countries where profit margins are easily eroded by any new trade barrier, prompting potential foreign trading partners and investors to seek more promising opportunities elsewhere.

Mandates for in-country data storage, local goods and services, local procurement, data protection and privacy, and online censorship are often seen as necessary to achieve some economic or security objective. However, the breadth and depth of their impact on business investment and operation, global trade, and innovation are often not fully appreciated, nor is the ability to achieve a high level of data security regardless of where data resides.

Types of Cross-Border Data Flow Restrictions	
Local Data Storage	Restricts data flows by requiring specified data — often but not always personal information — to be stored on local servers. May also require specific applications or services to operate in-country, processing data locally to avoid offshore transfer.
Data Protection	Restricts data flows through application of data privacy laws with adequacy and/or consent requirements that cannot reasonably be met without local data storage.
Geolocation Data Privacy	Restricts data flows by preventing the collection, disclosure, transfer or storage of geolocation data without an individual's consent.
Local Goods, Services or Content	Restricts data flows by requiring use of locally provided services or locally generated content. May also require use of domestically made or locally sourced equipment — limiting choice and perhaps efficiency but not data flows per se.
Government Procurement	Restricts data flows by limiting government procurement of foreign goods or services — for example, restricting information technology and communications contracts to locally delivered services.
Online Censorship	Restricts data flows by blocking or filtering information transferred into or out of a country.
Government Investment/Tax	Affects data flows by using tax incentives to promote use of local content (defined above) or labor.
Ownership/Employment	Affects data flows by requiring in-country subsidiaries, branch offices or representation. May influence data flows by limiting foreign ownership or requiring joint ventures.
Local Production	Affects data flows by requiring local production of goods or services as a condition of market access — for example, requiring local data centers to deliver in-country services.
Payment Card Regulations	Affects payment data flows by requiring payment information to be stored locally.
Export Control	Affects data flows by requiring corporate intellectual property and other technology to reside in-country.
Forced Transfer of Intellectual Property	Affects data flows by requiring companies to transfer intellectual property to the countries in which they do business.
Traffic Routing	Affects data flows by requiring communications providers to route Internet traffic in a specific way.

Note: BRT companies identified a number of cross-border data flow restrictions. Many of these have been well documented by other organizations, as enumerated in the endnotes.^{57, 58, 59}

For example, a company wishing to advertise its goods or services may be hampered by storage restrictions that increase campaign costs, local service requirements that reduce provider selection, Internet content restrictions that limit ad scope and censorship laws that reduce ad delivery vectors. As restrictions proliferate, their impacts are compounded until businesses operating in such countries — whether locally owned or international business units of multinational corporations — simply cannot compete with businesses located elsewhere.

In addition, BRT companies report that other market access restrictions affect cross-border data flows in more subtle ways. For example, government tax incentives, joint venture/local ownership laws and in-country payment processing requirements may be intended to advantage local companies and create local jobs. However, all of these market restrictions could have the opposite effect by discouraging foreign direct investment and entrepreneurship in emerging markets and triggering job losses in developed markets.

Similarly, export controls and law enforcement access mandates may aim to preserve national security but can affect cross-border data flows in unanticipated ways that drive up costs, create delays and ultimately discourage investment. For example, restrictions preventing export-controlled data from being sent electronically without government permission can inhibit communication inside a multinational company, forcing controlled data to be sent via post, introducing significant delay and reducing the level of data security.

In a 2014 study of digitally intensive industries, the U.S. International Trade Commission (ITC) found that these barriers are having discernable effects on digital trade, negatively affecting U.S. productivity and employment.⁶⁰ It stands to reason that minimizing these barriers would facilitate data flows among trading partners on a global scale, positively affecting digital trade everywhere — not just for U.S. firms but for companies across the world.

Sovereign governments have the right and responsibility to enact laws in the best interest of their constituents. But successfully achieving any policy goal requires clarity. Raising awareness of the economic damage that such policies could easily cause will help businesses and governments work together to address concerns by pursuing policies that balance risks, further nontrade-distorting goals and enable the transfer of data across national borders. To that end, let's further explore three kinds of cross-border data flow restrictions now posing great risk to stakeholders all around the world.

Local Data Storage Requirements

Data storage laws affect cross-border flows by requiring specified data — often but not always personal information — to be stored on local servers. Such restrictions may also explicitly or implicitly require specific applications or services to operate in-country, processing data locally to avoid offshore data transfer.

Many laws and regulations that restrict data storage are proliferating across the globe, driven in part by policymaker desire to stimulate demand for local service providers, ensure adequate protection for data, and/or control law enforcement or regulator access to data.

Sampling of Local Data Storage Requirements		
Australia	Privacy Amendment Act 2012	2014
	Personally Controlled EHR Provision 77	2012
Brazil	Marco Civil da Internet (MCI)	2014*
Canada	Personal Information International Disclosure Protection Act	2006
	Freedom of Information and Privacy Act	2004
China	Article 20 of Provisions on Internet Culture	2011
	China's Financial Circular No. 7	2011
	Article 14 of Measures for ISPs	2000
European Union	EU General Data Protection Regulation	2012*
	EU Data Protection Directive 95/46/EC	1995
Greece	Greek Law No. 3917/2011	2011
Indonesia	Government Regulations on Implementation of Electronic System and Transaction	2012
New Zealand	Revenue Alert RA 10/02	2010
Russia	On Information, IT, and Information Protection	2014
South Africa	Protection of Personal Information	2013
South Korea	Regulations on the Delegation of Information Processing and IT Facilities of Financial Companies	2013
Turkey	e-Privacy Regulation	2012*
	Draft Law Concerning Protection of Personal Data	2008*
Vietnam	Decree on IT Services No. 2012/ND-CP	2012*

* Proposed or draft

Among the examples listed in the table above are national laws or regulations requiring:

- ▶ All Internet service providers to store any retained subscriber traffic data in-country;
- ▶ All taxpayers to store business records in-country, even when cloud services are used; and
- ▶ All personal financial information collected in-country to be stored in-country.

These examples, as well as many others detailed in *Promoting Economic Growth through Smart Global Information Technology Policy*, illustrate several key challenges.

- ▶ **Restrictions are escalating.** BRT members are already dedicating significant resources to tracking, analyzing and complying with dozens of diverse local data storage mandates. This overhead creates a drag on the global economy, reducing profitability and investment just as taxes and tariffs do but without creating value. For example, in a recent survey by the U.S. ITC, localization requirements were the most oft-cited digital trade barrier, creating obstacles for 82 percent of large firms and 52 percent of SMEs in the digital communications sector.⁶¹ According to a study by The European Centre for International Political Economy (ECIPE), if economywide data localization requirements were enforced, they would reduce GDP in each of the seven countries/regions examined, with losses as high as 1.1 percent in the European Union (EU) and Korea.⁶²

- **Restrictions are nuanced, requiring interpretation.** BRT members report that cross-border investments and expansions are increasingly being delayed or deferred by this fragmentation, lack of legal clarity about proposed restrictions and uncertainty about future restrictions. ECIPE found that data localization requirements would have considerable negative impact on investment, including -3.9 percent in the EU and -4.2 percent in Brazil.⁶³ Exports would also decline as a result of reduced international competitiveness, with China and Indonesia seeing reductions of 1.7 percent, for example.⁶⁴
- **Restrictions impede effective adoption of innovative technologies.** Data storage requirements that force localization inherently reduce the value generated by every new technology that harnesses cross-border data flows. Many firms are finding that local data storage requirements not only undermine the value of new business models but also are contrary to the design of the global Internet.⁶⁵ ECIPE estimates that data localization requirements could cause welfare losses (economic losses by citizens) equivalent to 11 percent of the average worker's monthly salary in India, almost 13 percent in China, and around 20 percent in Korea and Brazil.
- **Restrictions reverse benefits already gained.** Companies that have used cross-border data flows to optimize and streamline their businesses could be forced to “turn back the clock” if required to store and process all data in-country. ECIPE estimates that GDP losses caused by data localization requirements would be sufficient to eradicate all post-crisis economic recovery benefits.
- **Broader restrictions have greater adverse impact.** BRT members in every sector report that blanket restrictions are causing needless economic harm, while restrictions that are more narrowly framed and goal-driven have fewer negative impacts and are less costly to manage. When resources can be focused on achieving outcomes that are aligned with policymaker goals, overhead and waste are reduced. Economies and consumers in restriction-imposing countries benefit when those excessive overhead and waste expenses do not have to be passed along in product or services costs.



Data Protection Requirements

Data protection laws often restrict cross-border data flows by defining adequacy and/or consent requirements that cannot reasonably be met without local data storage.

Related requirements most often cited by BRT members are the existing EU Data Protection Directive⁶⁶ and pending EU General Data Protection Regulation.⁶⁷ These requirements place conditions on the collection, storage and processing of personal data, permitting EU resident personal data to be transferred only when an adequate level of protection is ensured. While several mechanisms exist to address these adequacy requirements, all have proven to be prohibitively expensive, impractical or at risk.

- ▶ Companies may define standard contractual clauses to enable legal transfer of personal data outside of the EU. However, this mechanism can be extremely challenging for large multinational companies that must routinely exchange this kind of data not only internally but also with suppliers, contractors, collaborators and customers.

For example, employees who transfer from one country to another require services integral to moving to a new country, including submission of customs, immigration and visa forms for the transferee and his/her family as well as travel arrangements for their belongings. Maintaining contracts that enable forward transfers among all participants in this lengthy global supply chain is an inherently complex and costly undertaking, which magnifies the impact of every new requirement or country-by-country exception.

- ▶ Binding corporate rules (BCRs) build on standard contractual clauses by requiring data protection authority approval of centrally managed, legally binding privacy programs that ensure adequate protection for global transfers within a corporate entity. Unfortunately, BCRs add considerable overhead, delay and cost and do not fit well with the nonhierarchical intercorporate relationships that are common in modern multinational businesses.

For example, one large multinational consumer products company found that simply preparing BCR paperwork would have cost in excess of half a million dollars. Instead, this holding company chose to execute forwarding and processing agreements with hundreds of its member companies — a massive undertaking requiring all members and their chairs and legal officers to sign the agreements. Nonetheless, those agreements were still far less costly than being obligated to obtain BCR approval from the data commissioner of every country in which products are sold.

- ▶ To overcome these barriers, many U.S.-based multinational businesses rely upon the Safe Harbor framework negotiated between the European Commission and the U.S. Department of Commerce.⁶⁸ Safe Harbor was created to help U.S. organizations comply with the EU Data Protection Directive, which does not consider data protection laws enacted by each U.S. state to be adequate. However, Safe Harbor can still impede data flows by imposing contractual requirements that add cost without value — for example, by treating cloud providers that directly receive encrypted personally identifiable information (PII), but have no access to it, as data processors. Moreover, Safe Harbor is at risk of being overhauled, suspended or revoked — outcomes that could bring legal transfer of EU resident data to a halt, along with all trade that depends upon those data flows.

While BRT companies are highly motivated to protect the personal data of our employees and customers, the complexities, costs and uncertainties of complying with EU data protection requirements are growing, draining resources that could be more productively devoted to protecting data. The alternative — collect, store and process all EU resident data only within the EU — would have the same negative consequences previously ascribed to local data storage laws.

Moreover, while the EU may be leading the way in personal data protection requirements, more than 100 nations across the world have proposed or adopted their own data protection laws — and that number is growing, creating an increasingly complex and fragmented patchwork.

Examples listed in the table below include:

- ▶ A German ban on data exporters relying on Safe Harbor to determine whether an importer provides adequate protection;
- ▶ A Spanish regulation that implements more restrictive security measures and more specific rules on international data transfers; and
- ▶ Several national laws prohibiting transfer of personal data outside a defined regime, entirely or unless certain exceptions are met or user consents are obtained.

These examples are just a tiny fraction of the data protection requirements now facing globally connected businesses. According to IDC, the proportion of the digital universe requiring data protection will jump from 35 percent in 2012 to more than 40 percent by 2020.⁶⁹

Sampling of Data Protection Requirements		
Australia	Privacy Amendment Act 2012	2014
	Personally Controlled EHR Provision 77	2012
Brazil	Marco Civil da Internet (MCI)	2014*
	Ministry of Justice Draft Bill 281/2012	2012*
China	Information Security Technology Guideline for Personal Information Protection within IS	2012
European Union	EU General Data Protection Regulation	2012*
	EU Data Protection Directive 95/46/EC	1995
Germany	Consumer Protection Bill	2014
	Dusseldorfer Krels Resolution	2010
	Federal Data Protection Act	2009
South Korea	Personal Information Protection Act	2013
	Use and Protection of Credit Information Act	2008
Spain	Organic Law 15/1999	2009
	Royal Decree 1720/2007	2008
Sweden	Personal Data Act	1998
United States	Sector-specific laws such as Gramm Leach Bliley Act and Health Insurance Portability and Accountability Act	Various

* Proposed or draft

Certainly, some data protection requirements are more challenging and costly to meet than others. However, BRT members in every sector report more fundamental challenges lie in the sheer number and diversity of these laws, creating spiraling overhead as well as crippling uncertainty over future impacts on cross-border data flows throughout an increasingly balkanized Internet.

Geolocation Data Privacy Requirements

In addition to data protection laws, many nations enact other laws to preserve the personal privacy of individual citizens. While such privacy laws may not be focused on impeding cross-border data flows, they often do so by preventing the collection, disclosure, transfer or storage of selected data without the individual's consent. A prime example of this growing trend reported by several BRT companies is national laws pertaining to geolocation data.

Broad interpretations of privacy laws that treat geolocation data as personal data can inhibit the effective use of Internet-connected machinery in some countries. Location-based business intelligence — including the ability for an Internet-connected machine to report on its geolocation — can be extremely valuable to companies in many sectors. For example, geolocation data can help first responders locate airplanes that have crashed, help consumer goods companies optimize product delivery routes and help construction firms track heavy equipment to deter theft.

In each of these cases, it is the ability to collect, store and analyze the location of a business asset — not an individual — that brings value. However, today's fast-growing location-based services (LBS) market encompasses many other opportunities for growth and innovation, including navigation products and services, local search services, location-based mobile advertisements, location-specific health information and more. Blanket restrictions that mandate in-country storage of all geolocation data, without considering these many potential applications, could prevent local businesses and citizens from tapping benefits available in other nations.



IV. Benefits We Could All Lose — or Work Together To Maximize

As we have seen, cross-border data flows are driving global economic growth, foreign direct investment, business efficiency and innovation, and even social benefits. There is growing evidence that governments that embrace cross-border data flows do indeed gain the most from these many benefits.

- ▶ Based upon correlations among GDP growth and the global flows of goods, services, finance and people that rely on underlying data flows, economies with more connections have been seen to benefit up to 40 percent more than less connected economies.⁷⁰
- ▶ As noted in a Brookings Institution report, each 10 percentage-point increase in the penetration of broadband services leads to a 1.3 percent increase in economic growth, and Internet access can reduce the impact of an economy's geographical isolation from major export markets by 65 percent by enabling access to overseas markets.⁷¹
- ▶ Numerous studies show strong linkage between information and communications technology (ICT) usage and economic growth in developing countries. For example, ICT use in Malaysia has had a greater impact on manufacturing productivity than human capital has had.⁷² Particularly in emerging economies, ICT enables growth by giving new and small businesses ready access to global service delivery platforms.
- ▶ Companies in developed countries that have invested in foundational technologies such as sensors and analytics driven by data flows are realizing up to 62 percent of the potential IoE value at stake.⁷³
- ▶ Studies conducted by ECIPE found that EU restrictions on data transfers to the United States would reduce the EU's GDP by €104–170 billion (\$143–235 billion), accompanied by a 6.7 percent decline in EU services exports.⁷⁴
- ▶ U.S. ITC models predict that removing trade barriers faced by digitally intensive U.S. firms would increase GDP \$16.7–41.4 billion, wages 0.7–1.4 percent, total employment up to 0.4 million full-time equivalents and sales abroad up to 15 percent for some sectors.⁷⁵ **Given globally pervasive data flows and the broad reach of laws that impede them, BRT members believe that our trading partners in other countries would likely also see growth in their own GDPs, wages and employment if these barriers were eliminated.**

To BRT members, these macro-economic findings are not theoretical — we have experienced these costs and benefits firsthand as we conduct our business worldwide, tapping cross-border data flow opportunities to benefit our business units, trading partners, workers and customers everywhere. To further our mutual understanding of the benefits that come from flows of digital data, we share several of those experiences throughout this paper.

Unfortunately, these opportunities for global prosperity could be greatly diminished or lost altogether as the result of overbroad laws and regulations that have profound adverse impacts.

AT&T

DELIVERING GLOBAL CONNECTIVITY TO ENABLE THE INTERNET OF EVERYTHING

AT&T's global network is its foundation for providing high-speed, secure and reliable services to multinational companies. The leading trend for business customers is for their information to be mobile, cloud based and globally accessible. Multinational companies need to move and store data where they have employees, assets, customers and business operations. Accordingly, in an information-based economy, the flow of data across borders is fundamental to the ability to operate effectively in a country. AT&T's global network and services enable these multinational business requirements.

For example, AT&T is a global leader of machine-to-machine (M2M) solutions, which offer companies the ability to effectively connect with devices around the world. AT&T's Global SIM service enables M2M devices, ranging from aircraft engines and cargo containers to refrigerators and energy meters. As these devices move and operate around the world, the mobile connectivity of those devices to service platforms allows AT&T's customers to monitor locations, analyze usage and performance data, and remotely improve system performance. Today, the AT&T network connects more than 17 million wireless-enabled M2M devices, capable of operating around the world.

AT&T helps its business customers innovate in their development of M2M devices by building an efficient and reliable mobile delivery platform that works around the world. For M2M devices, which are highly sensitive to input costs, the AT&T Global SIM enables a highly predictable and cost-efficient platform that supports a "build it once, use it everywhere" approach to device distribution and operations. AT&T also helps customers certify the use of new devices on mobile networks by inviting companies to test their devices at its M2M Foundry innovation centers. These efforts allow customers to focus on their service, knowing that their devices can transmit information worldwide.

With global M2M platforms, as with other elements of the global information-based economy, cross-border data flows are inherent. Countries that continue to allow open information flows will facilitate a wide range of new technologies that improve business productivity. Such policies will promote investment, job growth and innovation in that economy. Conversely, countries that impose barriers to cross-border data flows will impede the availability and affordability of business-critical technologies in their countries, diminishing the potential for IT-enabled business investment and productivity gains.

To help governments and regulators formulate balanced policies that address reasonable concerns while maximizing cross-border data flow benefits, let's further explore the consequences of such restrictions, including workarounds, operating inefficiencies, unnecessary investments, staffing challenges, job losses, compliance costs, environmental and social impacts, and other consequences on companies, trading partners, employees and customers around the globe.

Operating Inefficiencies and Costly Workarounds

Laws that impede cross-border data flows can degrade operating efficiency by reversing benefits gained through consolidation, collaboration and information-based business innovations. For example, in the oil, metal and mineral extraction industries, cost reductions of up to 10 percent realized through Internet-connected machinery could be lost.⁷⁶ In the health care industry, an estimated \$165 billion per year of savings attributed to big data analytics could be compromised.⁷⁷ Companies in all sectors could be forced to scale back or abandon back-office consolidations, increasing operating costs 30 percent or more.⁷⁸

Unless care is taken to minimize business impacts, these and countless other efficiency gains could easily be lost to overbroad restrictions. Additionally, business models involving big data analytics provide value when data can be aggregated from a very large set of highly distributed sources. If data collected in a given country must be stored and processed there, big data accuracy can be reduced, killing that technology's value proposition.

Choking off cross-border data flows can also force costly workarounds.

When laws require data to be stored and processed in-country, companies may attempt to comply by replicating (at great cost) otherwise centralized systems, connectivity, software and even supporting data. A company that hosts back-office services at two centralized data centers (one primary, one backup for resiliency and disaster recovery) could see operating costs multiplied by a factor of three to five if forced to create regional data centers. For example, one BRT member company forced by law to create a small data center in Canada spends \$1 million annually on that two- to three-worker operation.

Furthermore, multinational companies of all sizes that develop content for global distribution or share services on a global scale may be forced to duplicate associated effort. For example, a company that develops online content for Facebook or WordPress must redesign and redeploy that content in countries that censor those platforms. One BRT member estimated that each time these platforms cannot be used to distribute content in China, 15 percent in potential revenue could be lost.

In some cases, steps taken to comply with requirements may reduce efficiency for both the provider and customer. For example, when a new EU law required consumers to opt in to website cookies, most websites serving EU citizens were updated to display an opt-in dialog box that consumers must now click but rarely read. In effect, this workaround reduced efficiency for all without adding true value, at an estimated annual cost of \$2.3 billion.⁷⁹

Finally, many companies try to reduce data protection compliance risks by stripping or filtering data pertaining to individuals — for example, separating a truck driver's identity from delivery records. But stripping can vary across countries, multiplying complexity, inefficiency and cost. At one BRT member company, a single program spends approximately \$1 million to strip potentially personal data from records transferred across borders.

These kinds of workarounds and inefficiencies reduce margins and increase overhead, leading to higher prices. Companies are faced with three choices: absorb the higher costs out of profits, angering shareholders; pass the higher costs on to customers, raising prices; or forego the investment or activity altogether, reducing potential benefits to customers living in the country that imposes the barrier, access to innovative new goods and services, and associated economic growth and employment.

“Cross-border data flows allow companies to integrate their personnel, manage their global supply chains and customer networks, and maintain the competitiveness they need to grow and thrive.”

— Michael Corbat, CEO, Citigroup Inc.

Unnecessary Investments

In a recent survey of digital trade in the U.S. and global economies, firms reported that compliance with local data storage requirements can be expensive, time consuming, and disruptive to business planning and operations. However, the largest single cost may be the unnecessary capital investment required to build a new in-country data center.⁸⁰

One BRT member company's rule of thumb estimate for new data center capital investment is \$20 million per milliwatt of power consumed. But this estimate does not reflect local differences that affect cost. For example, building a data center in Brazil costs \$60.9 million on average, while building one in Chile or the United States costs \$51.2 million and \$43 million respectively.⁸¹ In addition, operating a data center in Brazil is approximately 40 percent more expensive because of high electricity costs and taxes.⁸²

Furthermore, large multinational companies typically build redundant data centers to ensure reliable service delivery, high availability, business continuity and disaster recovery. This redundancy is most cost-effectively achieved by deploying two or three identical regional data centers. However, if data can be stored only in-country, building multiple data centers within each affected country would mean deploying excess capacity

Citigroup Inc.

HELPING CUSTOMERS ACROSS THE GLOBE ACHIEVE THEIR FINANCIAL GOALS

Citi is a leading global bank with nearly 200 million customer accounts in more than 160 countries and jurisdictions. To provide customized financial services to clients, the company must efficiently move sensitive customer information and money around the globe. On peak days, Citi moves \$9 trillion — equivalent to more than half of the entire U.S. gross domestic product — mostly through electronic channels.⁸³

Digitization has transformed the way businesses, governments and consumers handle money, providing them access to financial services from anywhere around the globe. More than 60 percent of Citi's customer interactions are now online. Citi's digital financial services allow customers to conduct nearly all of their banking transactions without having to visit a brick-and-mortar branch. Citi's mobile banking platform, for example, allows customers to easily deposit checks, pay bills, and check balances and account information from the convenience of their smartphone or tablet. Indeed, in many developing countries personal banking transactions occur almost exclusively over cell phones. Similarly, CitiDirect BE Mobile allows company treasurers to do their jobs over secure mobile devices from any location.

To administer fast, trustworthy and reliable financial transactions, these innovations employ technologies that rely on the seamless and secure movement of data across borders. Today, Citi facilitates this movement through 20 regional data centers, harnessing economies of scale to provide a range of benefits including yielding cost savings. Citi uses these cost savings to improve the customer experience in a range of different ways and also, importantly, to purchase and employ state-of-the-art technologies that protect its customers' data. Ultimately, it is these technologies, not the physical location of data centers and servers, that enable Citi to maintain the integrity, security and confidentiality of its customers' financial transactions and data.

Restrictions on cross-border data flows could impede the ability to bring innovative financial services to customers across the globe by reducing economies of scale and requiring redundant investments in local data storage and security. These restrictions could act as barriers to potential market entrants, primarily hurting financial services customers — including governments, businesses and consumers — in the countries where restrictions are imposed. These customers could be denied competition-induced cost savings; service improvements; and access to innovative financial services products that yield social, economic and security benefits to customers elsewhere in the world.

that largely sits idle — a cost that may not be justified. In the event of a major disaster, recovery may be significantly delayed or even impossible without offshore data backup and processing.

As for operating costs, capital investments in local data centers are typically passed along to customers, rippling through the economy and ultimately reducing GDP in countries that impose such requirements. Additionally, centralized data centers help to maximize return on investment in performance and security measures. Decentralized architectures with many smaller, less robust data centers are more vulnerable to breach and failure.

Staffing Challenges and Job Losses

As McKinsey noted in its study on employee collaboration, companies that operate without perspective often “allocate resources inefficiently, manage talent blindly, and experience large disparities in effectiveness within and across units — they lack the ability to isolate what’s working; to decide what, where, and how to invest or to redefine roles/staffing levels.”⁸⁴

These are precisely the kinds of challenges experienced by BRT companies when required by data protection and local storage laws to fragment information pertaining to their workforce. For example, Walmart is in the process of building a more consistent HR delivery model, which would align processes, roles and data management platforms in all markets. If Walmart were unable to consolidate HR at a global level, it would lose its ability to analyze best practices and talent across all locations. That myopia could prove costly — both to employers and to employees who otherwise benefit from new employment opportunities.



Ultimately, data flow restrictions create skills gaps that force companies to relocate workers. As one BRT member company observed, “Where contracts do not allow shipping of data outside the country of origin, [we] have to take skills to the data, rather than taking data to skills.” Forced isolation of data simply makes IT-enabled business more difficult and less profitable. As ECIPE concluded, “Given the nature of today’s globally interconnected economy, poorly designed national policies that increase data processing costs have a severe economic impact as many sectors of the economy rely on digitally supplied services and goods.”⁸⁵

In fact, laws and regulations that mandate local data storage or joint ventures as a means of job creation are woefully misguided. In-country data centers require significant capital investment and operating expenditure but create very few local jobs. On the other hand, fully embracing digital trade and data-driven business trends like back-office consolidation creates millions of jobs. Within the United States alone, digital trade is estimated to increase aggregate employment by as much as 1.8 percent, along with economywide benefits such as higher wages, lower prices (through productivity gains) and increased purchasing power of consumer wages.⁸⁶

Compliance Costs

Another burden created by cross-border data flow restrictions is the escalating costs associated with legal and regulatory compliance. From risk analysis and policy development to reporting and audits, compliance efforts are draining time and money from the global economy.

For example:

- ▶ The United Kingdom Ministry of Justice estimates that the proposed EU General Data Protection Regulation could have an annual cost of £100–360 million.⁸⁷
- ▶ The European Commission estimates that the overall administrative burden of the EU Data Protection Directive is €5.3 billion.⁸⁸
- ▶ Simply reading compliance policies is estimated to cost the U.S. economy \$365 billion.⁸⁹
- ▶ An Internet entrepreneur in Turkey estimates that complying with website content restrictions accounts for 15 percent of total operating costs.⁹⁰
- ▶ Compliance costs for non-IT sector SMEs can require a 40 percent increase in IT budgets.⁹¹

Globally connected companies choose various methods of complying with data protection and other requirements. Within the communications industry, some companies find that complying with law enforcement assistance requests outpaces the value of doing business in some countries. Within the financial industry, companies have had some success negotiating memorandums of understanding (MOUs) with regulators, but MOUs must be negotiated on a case-by-case basis. As noted previously, many companies employ standard contractual clauses, BCRs or Safe Harbor to enable compliant data transfer — all at considerable cost.

While these costs are growing, greater risk lies in the fragmentation, churn and uncertainty, which drive up legal, administration and auditing expenses. For example, when McCann considered privacy frameworks under which to deploy its Truth App, it quickly abandoned a per-market approach that could easily require more than half a million dollars. McCann then moved to create a single strict policy for each region — but found that some were too complex, too unique or too likely to change in the near future. Such scenarios are common, as companies everywhere struggle to keep pace with ever-changing requirements and adjust to national and regional differences. Ultimately, this overhead can put smaller companies out of business and distract the rest from delivering quality goods and services to customers in every country.

Environmental and Social Impacts

Finally, as Internet connectivity and data flows are leveraged by eco-friendly technologies and clean air/clean water/green energy initiatives, overbroad laws may even cause environmental damage to the countries that enact them.

For example, by 2030, the Electric Power Research Institute estimates that “smart” power grids could cut overall carbon dioxide (CO₂) emissions by 58 percent; reduce power disturbances across all business sectors; and improve safety, security and quality of life, generating between \$1.3 trillion and \$2 trillion in benefits. Moreover, without “smart” grids, renewable intermittent “clean” power sources such as wind and solar cannot be fully realized.⁹² These green energy advances clearly benefit the countries in which they are used but rely extensively upon machine communication and big data.

Data helps many kinds of businesses reduce their environmental footprints. In agriculture, farmers are using data analytics to increase crop yields while reducing water use, fertilizer use and runoff. By collecting data from farm machinery, soil sensors, historic yield reports, GPS and other sources on remote servers, algorithms can be used to evaluate the best course of action. Customized advice is then provided to farmers or directly relayed to “smart” machines to take action (e.g., open or close an irrigation valve). This advice helps farmers avoid using more water, fertilizer and other inputs than is needed to maximize yields, cutting down on waste. For example, potato farmers in Romania used analytics during trials to reduce chemical input expenditures by up to 40 percent.⁹³ Data not only helps farmers optimize productivity in the short run but also can improve land management over the long run through field rotation optimization.

Manufacturers in many industries across the world are also harnessing data to better the countries in which they operate. For example, one leading European chemicals manufacturer used neural-network analysis to measure and compare the relative impact of production parameters, including coolant pressures, temperatures, quantity and CO₂ flow. By resetting parameters, the company was able to reduce its waste of raw materials by 20 percent and its energy costs by around 15 percent, thereby improving overall yield.⁹⁴

GE USING M2M TO REDUCE FLIGHT DELAYS AND POWER FAILURES

The Internet-connected world has rapidly expanded to include physical objects — the so-called Internet of Everything. In line with this trend, GE is leveraging advancements in sensor technologies, digital communications and data analytics to improve the performance of industrial equipment and machines purchased by its customers. Advanced sensors embedded in a wide array of machines and equipment allow GE to remotely capture performance data from around the globe and use that data to improve product reliability, safety and efficiency. This capability moves GE and its customers from a reactive to a predictive environment, creating tangible benefits for customers.

For example, in the aviation sector, GE monitors sensor data from aircraft engines around the globe from its facilities in Evendale, Ohio. Analysis of fleetwide data from customers around the world enables GE to identify best practices, optimize engine performance and proactively identify flaws to improve engine design. This information helps airlines anticipate maintenance issues and address them before aircraft need to be grounded, saving time and money for airlines and travelers. GE estimates that using sensor technology to reduce delays and cancellations caused by aircraft maintenance needs could save airlines more than \$2 billion per year worldwide.⁹⁵

GE also uses sensor analytics in the energy sector. Data collected from sensors in GE gas turbines provide insights across the fleet and at individual customer plants. Aggregated data from turbines around the world allow GE to create industrywide benchmarks and determine design, operation or configuration flaws for specific turbine models. At individual plants, GE and its customers remotely monitor site data and detect when turbines are operating outside of normal parameters. This near-real-time monitoring allows plants to identify faults before they become major, unplanned outages that harm power producers and the consumers they serve. For example, one centralized GE monitoring center was able to identify a crack in a generator rotor before it became a serious problem, saving the company months of unplanned outages and an estimated \$15–35 million.⁹⁶

The ability to aggregate and analyze sensor data supplied from locations around the world is critical to GE’s ability to generate savings for individuals, governments and businesses across the globe. Data flow restrictions, however, pose a serious threat to realizing these benefits. In particular, local server requirements that prevent GE from transferring equipment data to its centralized monitoring systems would eliminate the ability to benchmark customers’ data against the broader data set, thereby making it harder for airlines, power companies and other customers to anticipate and avoid costly, and potentially dangerous, equipment failures. By instating regulations that broadly require all data to remain on local servers, countries run the risk of foregoing opportunities for valuable industry advancements, cost savings and standard of living improvement.

Companies with data centers often use consolidation to contribute to “green” initiatives. As part of its sustainable living program, Unilever, a U.K.-based multinational company selling products in more than 190 countries, is now consolidating six regional data centers into two. This consolidation not only cuts cost and improves efficiency — but it also slashes CO₂ emissions and achieves a 20 percent reduction in energy consumption.⁹⁷ Countries that prevent this kind of global consolidation by mandating in-country data centers are inevitably driving up not only costs but also local energy consumption and air pollution.

Such benefits are not limited to private-sector companies. Many governments are now using data in creative ways to reap economic, environmental and social benefits. For example, Barcelona’s Smart City initiative uses Internet-connected sensors to capture and feed vital information into its 83 separate projects, including “smart” water, “smart” lighting, “smart” parking, “smart” waste management and “smart” energy management.⁹⁸ The potential benefits are great: “Smart” water alone saves Barcelona \$58 million annually by using “smart” water meters, remotely irrigating the city’s green spaces and remotely controlling the city’s fountains. Smart City projects are supported by a citywide network that interconnects devices, buildings and people — including 44 “Citizens Attention” kiosks allowing private citizens and companies to develop new applications to address needs of city residents. This initiative serves as an example of a technology-efficient, data-driven, environmentally sustainable 21st century city — a fast-growing trend now being replicated by cities and countries and even regions across the globe.

These are just a few of many scenarios that could turn out differently if restrictions stifle technologies that can improve the environment shared by every person on this planet and create a cleaner, greener tomorrow for our children.



V. Recommendations for Global Policymakers and Trade Negotiators

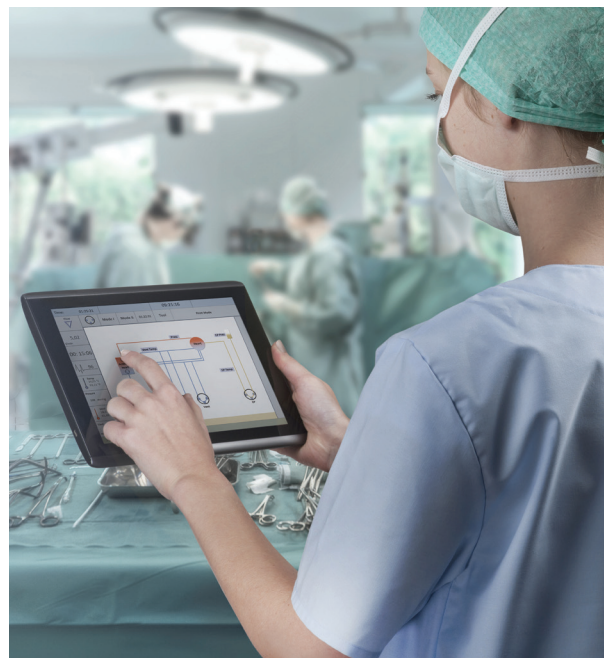
BRT members believe that globally consistent IT policies promoting market-friendly conditions for cross-border data flows are in the best interest of the global economy. As demonstrated in this paper, businesses in every country and their customers worldwide can gain enormous benefits by embracing cross-border data flows, fully realizing opportunities that could be lost if overbroad restrictions are permitted to stifle business innovation, social benefit and a broad array of digital trade activities.⁹⁹

We understand, however, that from time to time policymakers need to intervene in this marketplace to address reasonable concerns like national security or the need to protect personal data. Based on the insights provided by BRT members and presented in this paper, we recommend that policymakers consider the following principles whenever they seek to develop new laws, regulations or trade agreements that would affect cross-border data flows or IT infrastructure.

- ▶ **The law or regulation should be carefully crafted, as narrow in scope as possible, and focused on clearly articulated goals or purposes.** As demonstrated in this paper, barriers to cross-border data flows and restrictions on IT infrastructure can be costly to the country imposing them, as well as to the businesses affected. Carefully crafted and narrowly focused restrictions would minimize the collateral damage to the economy imposing the restrictions. Understanding the specific problem that restrictions are expected to address will help to ensure that the law or regulation remains focused on addressing that problem at hand.
- ▶ **Policymakers should acknowledge and actively seek to address potential conflicts that may arise between the laws and policies of different jurisdictions.** For example, laws governing law enforcement access to data within one country may conflict with the laws or consumer protection expectations on data protection and privacy in other countries. These conflicts may lead governments to pursue local data storage mandates or other restrictions on data flows — a response that harms all users without addressing the underlying policy conflicts. Policymakers must be aware of this tension and should seek more constructive approaches to identifying and resolving these potential conflicts, striving to maximize the economic benefits of data flows while strengthening consumer trust and reducing legal uncertainty.
- ▶ **Policymakers should evaluate the full costs and full benefits of the proposed rule or regulation.** Policymakers should look not only at the direct effects but also at the indirect effects on both domestic and foreign companies of all sizes and on consumers across the economy. The results of the analysis should be made public.
- ▶ **To this end, input should be sought from the private sector well in advance of imposition of the change to laws or regulations.** Policymakers should be aware of business activity or investments in their economies contemplated by domestic or foreign companies that depend heavily on cross-border data flows and how the imposition of a new law or regulation could affect that activity or investment. Policymakers need to fully appreciate how companies already engaged in the local economy will react to a change in laws or regulations. Policymakers need to understand the degree to which nontechnology companies depend on cross-border data flows to appreciate how a new law or regulation could have a broader impact than

anticipated. Publicizing intended changes to local laws or regulations and inviting input from the public will give all companies an opportunity to help policymakers better understand the likely impacts of a contemplated change so that it can be refined to minimize the negative impacts.

- ▶ **The process for implementing the law or regulation should be transparent.** Those who would be affected by a new law or regulation should have ample opportunity to know that the change is pending, when it is likely to occur and what the process will be for implementation. Implementation should take place after some reasonable period of time, or gradually over time, so that businesses can adapt if possible.
- ▶ **Policymakers should seek to minimize the frequency or suddenness of changes to laws or regulations.** Uncertainty kills business. Companies avoid doing business in countries that change policy or practice often or suddenly. It is then the local economy and its consumers who suffer, as globally engaged businesses opt to trade or invest elsewhere.
- ▶ **Policymakers should use trade agreements and international negotiating forums to ensure that unnecessary restrictions on cross-border data flows and barriers to IT infrastructure are not imposed by their trading partners.** Specifically, for example, negotiators should seek to have obligations, rules, disciplines and commitments on cross-border data flows included in trade agreements; ensure that governments refrain from implementing trade- or investment-related measures that impede digital trade, restrict cross-border data flows, or require local storage or processing of data; and obtain commitments that regulations affecting digital trade and cross-border data flows meet the principles suggested above.
- ▶ **Policymakers should seek to minimize fragmentation.** Countries may still impose minimized requirements to deal with exceptions permitted by trade agreements. However, such laws should not be more restrictive or fragmented than absolutely necessary, thereby demonstrating that country's overarching commitment to enabling cross-border data flows in a globally consistent environment of compatible laws.



VI. Our Call to Action

As CEOs of multinational companies, BRT members are keenly aware of the importance of cross-border data flows. Just as data flows are inherently borderless, so are the vast benefits of putting data to work. In today's connected world, data flows are the lifeblood of our economy, offering limitless opportunities for innovation, social benefit, growth and prosperity. Data flows foster innovation, drive foreign investment, create jobs and open new doors for companies in all sectors and nations — especially small businesses and emerging economies.

However, we now stand at a crossroads.

We can all work together to forge a global consensus that embraces cross-border data flows and minimizes restrictions and trade barriers. We can use education and transparency to more effectively address reasonable concerns such as privacy, striving for tightly focused policies that reduce uncertainty, avoid protectionism, and optimize the economic and social benefits of data.

Or we can stay the course, continuing to struggle one by one with increasingly fragmented national laws and regulations around the world. We can allow escalating data flow restrictions to isolate businesses and consumers, sap productivity, reverse data-driven advances, eliminate promising new opportunities, discourage expansions, and erect global trade barriers.

BRT CEOs believe that working together to embrace cross-border data flows is in the best interest of globally connected businesses (large and small, domestic and foreign) in every country and sector, as well as every government and its citizens. Moreover, if policymakers fail to adjust course now, our global economy faces significant risk.

We believe that this paper offers a means to initiate a global dialogue on maximizing the value of cross-border information flows and the importance of minimizing restrictions. To break new ground, we urge all stakeholders in this global value chain to engage in the dialogue, including private-sector business leaders in all countries, manufacturers and supply chain partners everywhere, and small businesses and individual citizens around the globe. Let us all help our governments, trade negotiators and policymakers understand how we depend upon data and what we stand to gain or lose.

Ultimately, we believe that sustained global growth and prosperity hinge upon charting a new course — one that embraces our interconnectedness; puts data to work; and seeks more productive ways to give governments reasonable assurances while minimizing trade barriers, promoting cross-border business investment and maximizing benefits for all stakeholders.

Endnotes

1. Business Roundtable (2012). *Promoting Economic Growth through Smart Global Information Technology Policy: The Growing Threat of Local Data Server Requirements*. Available at http://businessroundtable.org/sites/default/files/Global_IT_Policy_Paper_final.pdf.
2. Internet World Stats (2014). "World Internet Usage and Population Statistics." Available at www.internetworldstats.com/stats.htm.
3. Pew Research (2014). "Digital Life in 2025." Internet Project. Available at www.pewinternet.org/2014/03/11/digital-life-in-2025.
4. McKinsey Global Institute (2014). "Global flows in a digital age: How trade, finance, people, and data connect the world economy." Available at www.mckinsey.com/insights/globalization/global_flows_in_a_digital_age.
5. *Ibid.*
6. The International Data Corporation (2012). "The Digital Universe in 2020: Big Data, Bigger Digital Shadows, and Biggest Growth in the Far East." Sponsored by EMC Corporation. Available at www.emc.com/collateral/analyst-reports/idc-the-digital-universe-in-2020.pdf.
7. AT&T Inc. (2014). Available at <http://about.att.com/mediakit/m2m>.
8. IBM (2013). "IBM 2013 Annual Report." Available at www.ibm.com/annualreport/2013/index.html.
9. Deloitte (2012). "Machine-to-Machine: Vision 2020 — Is India ready to seize a USD 4.5 trillion M2M opportunity?" Available at www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-tele-tech-2013-noexp.pdf.
10. Machina Research (2013). "Report — M2M Communications in the Manufacturing & Supply Chain Sector." Available at <https://machinaresearch.com/news/press-release-m2m-will-have-a-transformational-effect-on-the-manufacturing-and-supply-chain-sector/>.
11. Caterpillar, Inc. (2014). "Product Link™ gives loggers a competitive edge." Available at www.cat.com/en_US/articles/customer-stories/technology/product-link-givesloggersacompetitiveedge.html.
12. *Ibid.*
13. Adler, E. (2013). "Here's Why 'The Internet of Things' Will Be Huge, and Drive Tremendous Value for People and Businesses." *Business Insider Tech*. Available at www.businessinsider.com/growth-in-the-internet-of-things-market-2014-1.
14. Cisco Systems, Inc. (2013). "Embracing the Internet of Everything To Capture Your Share of \$14.4 Trillion." Available at www.cisco.com/web/about/ac79/docs/innov/loE_Economy.pdf.
15. International Telecommunication Union (ITU) (2014). World Telecommunication/ICT Indicators database. Available at www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx.
16. Verizon (2014). "Verizon and GE to Expand the Reach and Strength of Industrial Internet." Available at <http://news.verizonenterprise.com/2014/10/ge-m2m-verizon-industrial-internet>.
17. ABI Research (2014). "IoT Developers to Total 3 Million in 2019, Paving the Way for Hardware Resistance." Available at <https://www.abiresearch.com/press/iot-developers-to-total-3-million-in-2019-paving-t>.
18. Verizon (2014). "Verizon Enterprise Technology Trends for 2015." Available at <http://news.verizonenterprise.com/2014/11/verizon-key-technology-trends-2015>.
19. McKinsey Global Institute (2013). "Disruptive technologies: Advances that will transform life, business, and the global economy." Available at www.mckinsey.com/insights/business_technology/disruptive_technologies.
20. IBM (2013). "IBM 2013 Annual Report."
21. The International Data Corporation (2014). "IDC Predictions 2015: Accelerating Innovation — and Growth — on the 3rd Platform." Available at www.idc.com/getdoc.jsp?containerId=252700.
22. McKinsey & Company (2014). "How big data can improve manufacturing." Available at www.mckinsey.com/insights/operations/how_big_data_can_improve_manufacturing.
23. IBM (2013). "IBM 2013 Annual Report."
24. O'Connell, J. (2014). "The State of Programmatic Media — Q2 2014." Available at https://research.adexchanger.com/news/state_of_programmatic/.
25. Cisco (2013). "Embracing the Internet of Everything."
26. McKinsey Global Institute (2014). "Sectors Where Big Data Could Make an Impact." *The Wall Street Journal*. Available at <http://blogs.wsj.com/experts/2014/03/28/sectors-where-big-data-could-make-an-impact>.
27. Jacobs, S. (2014). "'Big Data' comes to Africa." *This is Africa*. Available at www.thisisafricaonline.com/News/Big-Data-comes-to-Africa.
28. Walker, J. (2012). "Meet the New Boss: Big Data." *The Wall Street Journal*. Available at www.wsj.com/news/articles/SB10000872396390443890304578006252019616768.

29. Brookings Institution (2014). "Supporting the Internet as a Platform for International Trade — Opportunities for Small and Medium-Sized Enterprises and Developing Countries." Global Economy and Development. Available at www.brookings.edu/~media/research/files/papers/2014/02/internet%20international%20trade%20meltzer/02%20international%20trade%20version%202.pdf.
30. BSA: The Software Alliance (2014). "Data Analytics Survey of Business Executives." Available at <http://techpost.bsa.org/2014/12/10/executive-survey-the-shows-the-benefits-of-data-innovation-across-whole-economy>.
31. McKinsey Global Institute (2011). "Capturing value through IT consolidation and shared services." Available at www.mckinsey.com/~media/mckinsey/dotcom/client_service/Public%20Sector/PDFS/McK%20on%20Govt/IT%20Challenge%20and%20opportunity/MOG7_Consolidation.ashx.
32. Accenture (2011). "How to manage a global workforce." Talent & Organization Performance. Available at www.accenture.com/us-en/outlook/Pages/outlook-journal-2011-manage-global-workforce.aspx.
33. *Ibid.*
34. KPMG (2014). "China shared services: Start now!" KPMG Global China Practice. Available at www.kpmg.com/DE/de/Documents/China-360-Issue17-201404-China-shared-services.pdf.
35. IBM (2011). "IBM 2011 Annual Report." Available at www.ibm.com/annualreport/2011/ghv.
36. McKinsey Global Institute (2013). "Disruptive technologies."
37. Cisco (2013). "Embracing the Internet of Everything."
38. IBM (2014). "Improve your operating model and interconnect end-to-end supply chain functions to optimize process efficiencies." Operations and supply chain consulting services. Available at www-935.ibm.com/services/us/gbs/operations-and-supply-chain.
39. Forrester (2014). "Forrester: Collaboration Services: Deployment Options for the Enterprise." Available at www.comstorcloud.com/sw/themes/34194/site_images/2012_11_Collaboration_Services_Deployment_Options_For_The_Enterprise_%28Forrester%29.pdf.
40. Cisco Systems, Inc. (2010). "The Return on Collaboration: Assessing the Value of Today's Collaboration Solutions." Available at www.cisco.com/c/dam/en/us/solutions/collateral/enterprise/collaboration-strategies/c11-597613-00_return_collab_wp.pdf.
41. *Ibid.*
42. The International Data Corporation (2012). "Bridging the Information Worker Productivity Gap: New Challenges and Opportunities for IT." Available at www.images.adobe.com/content/dam/Adobe/en/products/acrobat/axi/pdfs/bridging-the-information-worker-productivity-gap.pdf.
43. Cowhey, P. and Kleeman, M. (2008). "Unlocking the Benefits of Cloud Computing for Emerging Economies — A Policy Overview." University of California San Diego. Available at irps.ucsd.edu/assets/001/503998.pdf.
44. IBM (2013). "IBM 2013 Annual Report."
45. Verizon (2014). "Verizon State of the Market: Enterprise Cloud 2014." Available at <http://cloud.verizon.com/enterprise-cloud-report>.
46. IHS Technology (2013). "Cloud & Big Data Report — A Paradigm Shift in the ICT Industry — 2013." Available at <https://technology.ihs.com/445918/cloud-big-data-report-a-paradigm-shift-in-the-ict-industry-2013>.
47. McKinsey Global Institute (2011). "Capturing value through IT consolidation and shared services."
48. Cowhey, P. and Kleeman, M. (2008). "Unlocking the Benefits of Cloud Computing for Emerging Economies."
49. *Ibid.*
50. Verizon (2014). "Verizon State of the Market: Enterprise Cloud 2014."
51. Microsoft (2014). "Cloud Infrastructure: Datacenters and Network Fact Sheet." Available at www.microsoft.com/en-us/server-cloud/cloud-os/global-datacenters.aspx.
52. McKinsey Global Institute (2013). "Disruptive technologies."
53. Cowhey, P. and Kleeman, M. (2008). "Unlocking the Benefits of Cloud Computing for Emerging Economies."
54. McKinsey Global Institute (2013). "Ten IT-enabled business trends for the decade ahead." Available at www.mckinsey.com/insights/high_tech_telecoms_internet/ten_it-enabled_business_trends_for_the_decade_ahead.
55. Brookings Institution (2014). "Supporting the Internet as a Platform for International Trade."
56. McKinsey Global Institute (2013). "Ten IT-enabled business trends for the decade ahead."
57. U.S. International Trade Commission (2013). "Digital Trade in the U.S. and Global Economies, Part 1." Available at www.usitc.gov/publications/332/pub4415.pdf.
58. U.S. International Trade Commission (2014). "Digital Trade in the U.S. and Global Economies, Part 2." Available at www.usitc.gov/publications/332/pub4485.pdf.
59. Kommerskollegium (2014). "No Transfer, No Trade — the Importance of Cross-Border Data Transfers for Companies Based in Sweden." National Board of Trade. Available at www.kommers.se/Documents/dokumentarkiv/publikationer/2014/No_Transfer_No_Trade_webb.pdf.

60. U.S. International Trade Commission (2014). "Digital Trade in the U.S. and Global Economies, Part 2."
61. *Ibid.*
62. The European Centre for International Political Economy (2014). "The Costs of Data Localisation: Friendly Fire on Economic Recovery." ECIPE Occasional Paper. Available at www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf.
63. *Ibid.*
64. *Ibid.*
65. U.S. International Trade Commission (2014). "Digital Trade in the U.S. and Global Economies, Part 2."
66. European Union Data Protection Commissioner. "EU Directive 95/46/EC — The Data Protection Directive." Available at www.dataprotection.ie/docs/EU-Directive-95-46-EC/89.htm.
67. European Commission. "Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation)." Available at http://ec.europa.eu/justice/data-protection/document/review2012/com_2012_11_en.pdf.
68. U.S. Federal Register (2000). "U.S.-EU Safe Harbor Framework Documents." Available at www.export.gov/safeharbor.
69. The International Data Corporation (2012). "The Digital Universe in 2020."
70. McKinsey Global Institute (2014). "Global flows in a digital age."
71. Brookings Institution (2013). "The Internet, Cross-Border Data Flows and International Trade." Available at www.brookings.edu/~media/research/files/papers/2013/02/25%20international%20data%20flows%20meltzer/internet%20data%20and%20trade%20meltzer.pdf.
72. Information Technology and Innovation Foundation (2014). "How ITA Expansion Benefits the Chinese and Global Economies." Available at www.itif.org/publications/how-ita-expansion-benefits-chinese-and-global-economies.
73. Cisco Systems, Inc. (2013). "Internet of Everything (IoE) Value Index: How Much Value Are Private-Sector Firms Capturing from IoE in 2013?" Available at www.cisco.com/web/about/ac79/docs/innov/IoE_Economy.pdf.
74. The European Centre for International Political Economy (2014). "The Costs of Data Localisation: Friendly Fire on Economic Recovery." ECIPE Occasional Paper. Available at www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf.
75. U.S. International Trade Commission (2014). "Digital Trade in the U.S. and Global Economies, Part 2."
76. McKinsey Global Institute (2013). "Disruptive technologies."
77. McKinsey Global Institute (2011). "Big data: The next frontier for innovation, competition, and productivity." Available at www.mckinsey.com/insights/business_technology/big_data_the_next_frontier_for_innovation.
78. Booz & Company (2009). "Reshaping Your Company Business Model — Building for the Future During the Downturn." Available at www.strategyand.pwc.com/media/uploads/Reshaping_Your_Company_Business_Model.pdf.
79. ITIF (2014). The Economic Cost of the European Union's Cookie Notification Policy. Available at www.itif.org/publications/economic-cost-european-unions-cookie-notification-policy.
80. U.S. International Trade Commission (2014). "Digital Trade in the U.S. and Global Economies, Part 2."
81. Chander, A. and Le, U. (2014). "Breaking the Web: Data Localization vs. the Global Internet." California International Law Center. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2407858.
82. Brasscom Brasil (2013). "Debate sobre Marco Civil da Internet." Available at www2.camara.leg.br/atividade-legislativa/comissoes/comissoes-permanentes/cctci/audiencias-publicas/2013/eventos-2013/ap-2013.08.07-marco-civil-da-internet/nelson-wortsman-brasscom.
83. Mobile World Congress (2014). "Citi CEO Michael Corbat's Keynote." Available at www.citigroup.com/citi/news/executive/140225Ea.htm.
84. McKinsey (2006). "Mapping the value of employee collaboration." McKinsey Quarterly. Available at www.mckinsey.com/insights/organization/mapping_the_value_of_employee_collaboration.
85. The European Centre for International Political Economy (2014). "The Costs of Data Localisation."
86. U.S. International Trade Commission (2014). "Digital Trade in the U.S. and Global Economies, Part 2."
87. Kommerskollegium (2014). "No Transfer, No Trade."
88. *Ibid.*
89. *Ibid.*
90. Dalberg (2014). "Open for Business? The Economic Impact of Internet Openness." Available at www.dalberg.com/documents/Open_for_Business_Dalberg.pdf.
91. Kommerskollegium (2014). "No Transfer, No Trade."

92. Electric Power Research Institute (2011). "Estimating the Costs and Benefits of the Smart Grid — A Preliminary Estimate of the Investment Requirements and Resultant Benefits of a Fully Functioning Smart Grid." Available at <http://ipu.msu.edu/programs/MIGrid2011/presentations/pdfs/Reference%20Material%20-%20Estimating%20the%20Costs%20and%20Benefits%20of%20the%20Smart%20Grid.pdf>.
93. NEC (2014). "NEC and Dacom collaborate on precision farming solution to maximize yields and reduce costs." Available at www.nec-enterprise.com/News/Latest-press-releases/NEC-and-Dacom-collaborate-on-precision-farming-solution-to-maximize-yields-and-reduce-costs-791.
94. McKinsey & Company (2014). "How big data can improve manufacturing."
95. GE (2014). "GENx Aircraft Engine and the Industrial Internet." Available at www.geaviation.com/stories.
96. GE (2012). "Framework for a Centralized Mon. & Diagnostic Center." Available at www.ge-ip.com/download/framework-for-a-centralized-monitoring-diagnostic-center/13439.
97. Unilever (2014). "Sustainable Living – Reducing Energy Consumption." Available at www.unilever.com/sustainable-living-2014/reducing-environmental-impact/greenhouse-gases/reducing-office-impacts/reducing-energy-consumption.
98. Cisco Systems, Inc. (2014). "IoT-Driven Smart City Barcelona Initiative Cuts Water Bills, Boosts Parking Revenues, Creates Jobs & More." Available at http://internetofeverything.cisco.com/sites/default/files/pdfs/Barcelona_Jurisdiction_Profile_final.pdf.
99. We should note that cross-border data flows addressed within this paper go far beyond digital trade (i.e., movement of goods and services across the Internet), encompassing all business movement of data across national borders, including HR data, finance data, supply chain data and other data not for sale.



300 New Jersey Avenue, NW
Suite 800
Washington, DC 20001

Telephone 202.872.1260
Facsimile 202.466.3509
Website brt.org