Table of Contents

FOREWORD..........................................................2

INTRODUCTION ...................................................3

EXECUTIVE SUMMARY .........................................4

KEY MESSAGES
  1. Willingness to Share ....................................6
  2. Defining Value .............................................8
  3. Digital Trust ................................................13

A FINAL WORD...................................................15

CITATIONS ..........................................................16
Driverless cars. Wearables at work and home. Machines that tell the operator there is an issue before they break down. Exciting new capabilities powered by the Internet of Things (IoT) are coming quickly. The best will weave into the fabric of our lives and work. They won’t just be nice to have, they’ll be must haves. They will be painkillers, and not vitamins. We’ll wonder how we got along without them.

As the benefits accrue, so does the amount of data that must be collected, managed and integrated with connected devices — and by enterprises everywhere. It’s a challenge that should not be underestimated, as well as the privacy and security questions that emerge.

Acquiring, searching and storing data is different than asking the right questions to separate the signal from the noise, which is different from extracting real insight to enable better, smarter, faster decisions.

Those with an advanced view of technology and the future will understand this difference. These enterprises and inventors will know exactly what ailments their data helps solve — and why. More vital, they will have the power to combine it, transform disparate parts into unexpected insights — using it to solve problems not yet even imagined. Machine learning, artificial intelligence, and computer vision are among the supplements that make the medicine more effective.

In the best cases, this data-driven intelligence can be lifesaving. Ingested sensors will accelerate medical diagnoses. Autonomous vehicles will revolutionize road safety. We’ll have precision knowledge we would not otherwise own. A drone won’t just assist in pesticide application; it will find the insect infestation and target its remedy.

Along with the acrobatics essential to draw intelligence from data, the IoT will require other fundamental movements. Regulatory frameworks must be rethought to provide privacy and security protections without tethering IoT innovations to conventional thinking. Until this occurs, there is a risk the U.S. will not be on the forefront on this revolution.

All companies must become data companies — or risk ‘data obesity,’ becoming bloated by data they are unable to use or leverage in meaningful ways. Already, data science is a core competency at leading companies across all industries.

Smart, safe data sharing must be the new normal. We’ve seen it gaining traction: I share search terms because I like the results. I put my faith in the five star ratings of strangers for a convenient ride home...hence the push towards opt-in vs. opt-out.

With trust and transparency — in what you put into sensor-driven devices and what you get out — the IoT will continue to flourish, making everything we do smarter, safer and more efficient. It will be the way of the world. And those out front will have a clear advantage...assuming the regulatory environment changes and the security issues are addressed.
Introduction

Rob Schimek, Executive Vice President and CEO, Commercial, AIG

If the IoT is the start of a new industrial revolution, then the safe sharing of big data will be the grease turning the wheels, the coal powering the furnace, the oxygen fueling the flame.

Automatic braking systems can prevent traffic accidents if manufacturers of the various component parts share data. Industrial grade wearables can reduce on-the-job strains and sprains if employees feel comfortable sharing data about their movements with employers. Smarter, greener buildings can optimize energy efficiency if the lights talk to the power grid. Predictive maintenance systems can eliminate unplanned downtime but work only if sensors and systems communicate with each other.

We believe that safe data sharing will power the new economy. It’s happening today. Imagine telling yourself five years ago that you would share photos of your newborn children with the world, you wouldn’t have to take out a wallet to pay the taxi driver – who comes right to you – and you’ll trust strangers to stay in your home based on a crowd-sourced rating system on your smartphone. What will surprise us in the next five years?

This report is the third part in a series of AIG research on innovative technology and risk in the past 18 months. It is the first global survey on the data sharing economy. We invested in this because we believe the benefits of safe data sharing – like those we’ve seen already – outweigh potential risks, which can be mitigated if we work together.

The survey aims to:
- Assess attitudes toward data sharing – in both commercial and consumer contexts – across nine global markets
- Define what types of data are viewed as sharable, under what conditions, with whom, and when
- Pinpoint who is willing to share data and their motivations; and
- Identify privacy protections and “must haves” that support data sharing.

We hope the findings will help business executives, including Risk Managers and Chief Risk Officers, consumers, investors and inventors, to understand current attitudes toward data sharing and their implications. Deciphering these is the first step in quantifying necessary tradeoffs and identifying the new business models, capabilities, and firms most likely to succeed in the sharing economy. A new kind of “digital trust” is being built in the workplace now, one relationship at a time. If you’re an employer or an employee, you’re part of it.

In our second report on IoT, Companies Leading the Connected Economy, I said that if Risk Managers and inventors can be as connected as the technology itself, we all win. Today, three things tell us this is even more true: our experience, data from this market research, and an examination of primary text written during and about the first Industrial Revolution, cited later in this whitepaper. Now, like then, if we are willing to engage in solving real problems and learning with our customers, the technology will practically invent itself.

I’m very optimistic about living in a future made better by technology. And I hope you’ll join me.
Executive Summary

Estimated to generate as much as $14.4 trillion globally by 2020,1 the IoT promises to transform all areas of our lives, paving the way to new efficiency, convenience, safety, and ways to manage and insure risk.

At first glance, the IoT’s potential seems limitless, borderless. The sensors, storage, analytics, and other connected technology central to its operation are only getting cheaper, faster, and smarter. But this new economy relies on something less predictable than the forward march of technology: the willingness of businesses and individuals to share data so that connected devices can generate insight, action, and value. This new economy is ultimately powered by the ability to gather, analyze, and improve our lives from the safe sharing of data.

This report presents the results of the first global survey of employee and employer attitudes toward data sharing and offers three key takeaways for participants in this new economy.

1. Employers and employees can be persuaded to share data – if there is some benefit to them.

Precisely what benefit they need vary, depending on who’s sharing and where. On a global basis, companies are most likely to share data when it directly impacts their ability to improve safety, manage risk, and boost revenues. In line with these motivations, a majority of employers responding to the survey are interested in the safety benefits that employee wearables at work can provide. Even more would add telematics to company cars.

Not all stakeholders in all markets value data sharing in the same ways. The strongest drivers of data sharing in some countries (e.g., improving financial performance, employee recruitment) are the weakest in others. These differences are largely a byproduct of the world’s diverse business, legal, tort and regulatory climates. Cultural differences likely play a role as well, which may be a topic for a future study.

2. Attitudes toward data sharing will determine which capabilities, devices, and firms will win or lose.

Given the diverse motivations around the world, business models that rely on data sharing, including the IoT, must carefully contemplate local appetites and incentives. What is perceived as value in a particular geography can inform decisions on everything from proof of concept spend and scale, to market positioning and pricing of products and services.
3. Unlocking value in the sharing economy requires a new kind of ‘digital trust.’

If data sharing is going to happen in the workplace, employees and employers concur, shared data must be kept private. But there’s more to digital trust than that. Employers need to have clearly stated policies on data monitoring. These policies will require a delicate balance of their own considerations with that of their employees to create an atmosphere of data sharing confidence and transparency. Employers need to mean what they say.

The role of regulators in forging and upholding digital trust remains to be seen. Employees and employers agree that current laws need updating to keep pace with data sharing business models. Meanwhile, successful digital platforms are taking trust building into their own hands – or those of their customers. Think of the widespread confidence instilled by peer-sourced reviews.

Winning in a world that relies on data sharing requires a keen understanding of attitudes and proper alignment with the concerns and motivations of companies and consumers in specific markets.

Where data sharing conditions are right, this new economy will thrive.

METHODOLOGY

AIG commissioned this survey of employees and business decision-makers in nine countries: the U.S., UK, France, Germany, Italy, Australia, Singapore, Japan and China. Approximately 400 employees and 250 business executives in each country were asked to complete a 20-minute online survey. The survey was executed on behalf of AIG by RTi Research, an independent global research agency.
Willingness to Share

Benefits of the IoT ride on the willingness of people and businesses to share data.

Great leaps in the workplace – from Frederick Taylor’s scientific ‘task’ management in 1911, to the Industrial Revolution’s mechanization – have always required tradeoffs. As the historian Eric Hobsawm noted, while new technology is interesting, shiny, and the first place to look, it’s the circumstances that surround the technology itself – including people’s mindsets and willingness to embrace the new – that marks the true tipping point. “Given the right conditions, the technical innovations of the industrial revolution practically made themselves…” This new sharing economy is no different. Before connected devices can revolutionize the way we work and live, the way we manage risk and insure it, the conditions must be right. Today, that means businesses, employees, and consumers must be willing to safely share data with others.

“Given the right conditions, the technical innovations of the industrial revolution practically made themselves...” This new sharing economy is no different.

There is an enormous market of individuals and companies willing to engage in the safe sharing of data: more than two-thirds of respondents said they would, if they receive some benefit from doing so. Before they share, businesses and individuals need to know what’s in it for them.

More than two-thirds of businesses and consumers said they are willing to share data if they perceive some benefit.

This large group of swing voters (75 percent) include early adopters (11 percent), willing to share data regardless of benefits. While there is some variance by country, the overwhelming majority of respondents in all countries surveyed would green-light data sharing if it benefits them.
BY INDUSTRY

The willingness to share for benefits spans all industries. Businesses that are more labor-intensive – and hence, more safety conscious – are among those most open to data sharing. Manufacturing (77 percent) and transportation/warehousing (79 percent) are cases in point. Both are safety-minded. They are also industries where early adopters are already realizing results.

According to a TATA Consultancy survey, manufacturers that utilized IoT in 2014 saw an average 28.5 percent jump in revenues over the prior year. That boost came largely with fundamental applications, such as tracing assets in factories, consolidating control rooms, and predictive maintenance tools. With manufacturers expected to pour $70 billion into IoT solutions in 2020, up from $29 billion in 2015, it’s fair to say this rise in revenue is just the start.

Data sharing is more prevalent among larger, higher growth companies. Companies currently sharing data self-report a growth rate nearly twice that of those that share on a limited basis or not at all.

EMPLOYEES & EMPLOYERS

The majority of both employers and employees are willing to share. Only in France are employees significantly less willing to share than employers.

In most countries, employees are more willing to share than employers.
Defining Value

What do companies and employees want in return for sharing? What’s valued around the world is a study in contrasts.

Across the globe, ensuring worker safety is consistently a primary motivator for data sharing. However, there are stark contrasts in what incent sharing from one country to the next: The strongest drivers of data sharing in some countries ranked weakest in others. This is most certainly a reflection of different cultural and business norms as well as disparate legal, tort, and regulatory environments.

In the U.S. and EMEA, for example, regulatory landscapes are evolving. Privacy lapses can have legal, regulatory, financial and reputational consequences for employers. In a separate survey, China ranked highest of all countries in trust of institutions of government, business, media and NGOs. Here, China ranked highest among both employees and employers in willingness to share data.

The correlation between trust and sharing was seen worldwide. Both employees and employers globally are significantly more open to sharing data with companies they perceive as ‘trusted.’

WINNERS & LOSERS: VALUE DRIVERS BY GEOGRAPHY

<table>
<thead>
<tr>
<th>STRONGEST DRIVERS OF SHARING (.5 correlation or higher)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improve the financial performance</td>
</tr>
<tr>
<td>• Reduce company insurance costs</td>
</tr>
<tr>
<td>• Improve recruitment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEAKEST DRIVERS OF SHARING (.2 correlation or lower)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improve the types of deals or offers for products and services</td>
</tr>
<tr>
<td>• Employee retention</td>
</tr>
<tr>
<td>• Being seen as an innovator</td>
</tr>
</tbody>
</table>

Japan is not closely associated with any motivators and it may be more difficult to convince businesses to share in that country.
While sharing for the sake of worker safety was the top motivator worldwide, value perceptions within individual countries are less predictable – with no clear demarcation along continental or cultural divides.

For example, U.S. and Australian companies are most likely to share data when it will improve financial performance, reduce company insurance costs, or improve employee recruitment, while businesses in Italy, Singapore, China, and Germany perceived these same factors as least motivating. The U.S. and Australia ranked improving deals or offers for products and services low on the value scale, while survey respondents in Italy, Singapore and China assigned this the highest value, along with being viewed as an innovator and retaining employees.

**Why it matters:** Knowing what constitutes value in a particular geography, a company can optimize proof of concept spend, scale, product/market positioning, and pricing. Some markets serve as proxies for others. Cultural differences matter.

**POWERS OF PERSUASION**

Overall, most companies around the globe were most likely to be persuaded to share data when it would directly impact their ability to manage risk, lower cost, and boost revenues. Globally across employers and employees, the highest ranking incentives included:

- Improving employee safety (59%)
- Improving security of company data (56%)
- Improving employee productivity (55%)
- Improving employee health or wellness (55%)
- Making employees safe driving company vehicles (55%).

“Softer” incentives, which fell on the slightly lower end of the scale, included:

- It’s ‘the right thing to do’ (44%)
- Serving business research interests (47%)
- Managing inventory levels (49%)
- Positioning the company as an innovator (49%).

In the UK and France, improving employee health and wellness, reducing payroll costs, and becoming more competitive were the strongest drivers of sharing. Employers in Germany viewed strengthening customer relationships, improving productivity, and managing inventory as the most winning value propositions.

Respondents made clear that value in the global sharing economy is not one size fits all. IoT concepts that catch on quickly in one country may fall flat in another. Data sharing attitudes and motivations may help explain why.

Unraveling this tangle of value perceptions is critical to success in any given market. Knowing what constitutes value in a particular geography, a company can optimize proof of concept spend, scale, product/market positioning, and pricing.
SCENARIO 1: WEARABLES @ WORK

More than half of employers in most countries said they are willing to ask employees to wear devices that help ensure safety at work.

Employees seemed receptive to the idea: The majority of employees in Italy, Singapore and China indicated they would probably wear an employer-provided device. When asked what types of information they’d be willing to share, employees in nearly all countries ranked data on workplace environmental conditions high on the list.

There is a global market for workplace wearables as well as telematics devices that monitor the driving and safety of employees using company cars or trucks.

Wearables are not just for fitness anymore. They are the new eyes and ears on the factory floor, the job site, and the offshore platform, allowing preventive steps to be taken to protect individuals and property before accidents or injuries occur.

Embedded in clothes or equipment, these sensors can give biometric data feedback that alerts employees and managers of potential workplace dangers ranging from exposure to dangerous temperatures or gases, to movements that will cause harm now or with repetitive motion over time. Ultimately, these technologies can generate real-time insights that can be used to predict and reduce risk, improve operational efficiencies, and decrease workplace injuries and deaths.

EMPLOYEES WOULD WEAR A DEVICE PROVIDED BY THEIR EMPLOYER

- **38%**
  - U.S./Australia

- **40%**
  - UK/France

- **56%**
  - Italy/Singapore/China

- **36%**
  - Japan

- **29%**
  - Germany
SCENARIO 2: TELEMATICS, GAMIFICATION

Slightly more popular than wearables at work was the notion of adding telematics to company cars to monitor employee driving habits and improve safety.

The idea was most widely embraced in Italy, where 79 percent of employees surveyed said they would consider adding these devices to company cars. This enthusiastic response could stem from experience: Italy was an early adopter of motor telematics in 2002. Telematics-driven usage-based insurance (UBI) is relatively more mainstream there than other markets. At the end of 2014, telematics represented 15 percent of motor insurance sales and renewals in Italy, reaching 30 percent in some regions, according to a recent analysis by the Italian Insurance Supervisory Authority (IVASS). Telematics rely on data sharing. The Italian insurance industry is now deploying telematics to improve customer satisfaction as well as safety.

As adoption spreads, usage-based auto and fleet insurance is made possible. UBI uses data from telematics to price insurance based on an individual’s real-time driving behavior — or even miles driven. It can be paired with new, customized services that help mitigate risk and lower insurance costs.

EXPECTATIONS TO PAY

Employers expect to pay for wearables and telematics, estimating the expense on par with an employee’s mobile phone subscription. Specifically, employers around the globe indicated that they expect to pay $418 to $917 per employee per year for wearables and $405 to $835 per worker per year for fleet telematics, depending on the market. U.S. employers value it most.

Employers are Willing to Pay

<table>
<thead>
<tr>
<th>WEARABLES AT WORK</th>
<th>FLEET TELEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$917</td>
<td>$835</td>
</tr>
<tr>
<td>$657</td>
<td>$607</td>
</tr>
<tr>
<td>$678</td>
<td>$643</td>
</tr>
<tr>
<td>$751</td>
<td>$802</td>
</tr>
<tr>
<td>$746</td>
<td>$711</td>
</tr>
<tr>
<td>$533</td>
<td>$652</td>
</tr>
<tr>
<td>$529</td>
<td>$547</td>
</tr>
<tr>
<td>$418</td>
<td>$405</td>
</tr>
<tr>
<td>$500</td>
<td>$494</td>
</tr>
</tbody>
</table>

(Reported in US$)
Ireland Gets in the Game

Gamification, informed by telematics, allows drivers to compare their own on-the-road performance with others. AIG saw firsthand the upside potential of this automotive black-box gaming in a pilot produced with rental car company EuropeCar Ireland.

With customers’ consent, telematics in rental cars captured real time data on driving, which translated to a ‘smooth driving score.’ Drivers with the highest scores were entered in a weekly raffle. The game was extremely popular (less than one percent of renters opted out). Nearly 37,000 drivers participated over 17 weeks, traveling more than 3.2 million miles. Not only did it help EuropCar promote positive customer relationships, with telematics incentivizing safer driving the company saw a 23 percent reduction in claims during the pilot period.

Singapore Among Early Adopters

In a separate AIG survey of 800 consumer drivers in Singapore, 68 percent would “definitely” or “probably” consider buying auto insurance from a company that offers a discount on the price of a policy if they install a telematics device on the car that tracks how much they drive.11 The less a driver drives, the less he or she pays – a business model made possible in the U.S. today by Metromile. This is directionally consistent with the results of the Data Sharing Economy survey which found in Singapore that: 56 percent of employers would consider adding devices to company cars that monitor driving habits, safety and location; and 55 percent of employers rated fleet telematics as “excellent to very good” (7 to 9 on a 9-point scale).

Collaboration to Make Roads Safer

AIG is proud to be a founding member and vice chairman of Together for Safer Roads (TSR), a global private sector coalition dedicated to improving road safety. TSR has recently developed a partnership with the City of Atlanta, Georgia. Included in the collaboration to prevent road crashes, injuries, and deaths are Georgia Tech University, the local Chamber of Commerce, and TSR member companies including AT&T, IBM and AIG.

In Atlanta’s most dangerous traffic corridor, the car crash index is 200-300 percent higher than the statewide average.12 The City of Atlanta recently passed a $250 million bond allocated to this issue – and the mayor’s office has asked TSR to advise on deployment of the investment as part of its “Safer Roads Challenge” initiative. TSR will apply machine learning to a public-private dataset to uncover solutions that can improve safety in the high-risk corridor. This partnership is innovative in its ability to combine public data (such as police reports, crash data, and demographic information) with private sector data (such as anonymized claims data, weather data, and inflow/outflow data) to deliver insights that can help improve road safety.

The effort illustrates how companies, municipalities, and universities are securely pooling data, advanced analytic capabilities, and technical expertise to reduce urban risks for citizens and business communities. TSR is honored that the City of Shanghai has appointed Professor Xuesong Wang of Tongji University’s Joint International Research Laboratory of Transportation Safety to serve as coordinator and adviser of our similar “Safer Roads Challenge” partnership in Shanghai.
Digital Trust

To unlock value in the new economy, employers need to provide meaningful data sharing incentives and establish a culture of ‘digital trust.’

More than half of companies responding to the survey think an employer has a right to collect and share data about how employees do their jobs. 56 percent believe this data can reduce risk and increase safety. The vast majority of employees, however, are not willing to share data without benefits, which vary significantly around the world. Moreover, sharers must know their data will be properly handled and their privacy protected. For data sharing to happen at work, there must be transparency and, importantly, a new kind of ‘digital trust’ between employees and employers.

What does this digital trust look like? A key prerequisite for both employees and employers is that data be kept private. In addition, employers must have clearly stated policies governing data monitoring in the workplace.

What should these policies look like? Employers and employees agree that workers should be notified if data about them is being collected and that they should ‘opt in’ rather than ‘opt out’ of data sharing. Common ground remains to be negotiated in other key areas. For example, 71 percent of employees felt they should be able to pick and choose what data is shared with their employer, while 56 percent of employers felt data monitoring should be a mandatory condition of employment.

Employers take note: While the benefits employees must derive from data sharing vary country to country, the need for digital trust is universal.

EMPLOYEES NEED TO HEAR

- Keep data PRIVATE
- Employer will TELL THEM
- “Opt In” rather “OPT OUT”
- Pick and CHOOSE

EMPLOYERS MUST TAKE THESE STEPS TO ENSURE DIGITAL TRUST

- Notify their EMPLOYEES
- Establish clear POLICIES
- “Opt In” rather “OPT OUT”
- Agree to MONITORING
REGULATORY REBALANCING

Do regulators have a role to play in building this digital trust infrastructure? Nearly 90 percent of employees and employers surveyed agree laws need to be updated to accommodate data sharing business models. However, they differ on how rebalancing should occur. But for China, a significant majority of employers in all countries indicated that laws should be reworked to favor companies, while the majority of employees in all countries believed rebalancing should favor individuals.

Beyond employee-employer considerations, regulators must balance desires for privacy with the potential for innovation, particularly in the IoT space, that can result from data sharing. They must regulate for a world of devices that will do things we have not yet even contemplated.

While it remains to be seen how governments will keep pace with this sharing economy, the enhanced access to information inherent in digital platforms can in itself build trust. Just a few years ago, taking rides from strangers was taboo. Today, reassured by Uber, Lyft, and other ride sharing services’ peer-sourced star rating systems, parents even trust them to shuttle kids home from school. That is a far cry from teaching our kids, “don’t get in the car with strangers.”

Nearly 90 percent agree laws must be updated to accommodate new data sharing business models.
A Final Word

The new data sharing economy, a world of sensor-driven, connected devices, can open opportunities on a global scale. The benefits and value of data sharing are real and with 75 percent agreeing to share if there is a benefit to them, there is a large, addressable market. It has the power to transform the workplace and the management of risk in ways we have not yet even imagined. As sensors capture and deliver data in real time, people and companies gain unprecedented abilities to observe and understand events and respond to them smartly and swiftly.

Capturing these advantages requires navigating diverse and often contradictory data sharing attitudes and motivations around the globe. It will happen only when companies infuse digital trust and transparency throughout their operations, educate employees and management, and provide meaningful incentives for information exchange.

At AIG, we believe these survey results will further our journey of learning together with our customers. We hope this report provides practical, actionable insights for the Risk Managers, Chief Risk Officers, and other executives who are leading their companies down the path of the IoT revolution.

This path leads to a safer, more efficient and productive world for all of us. We’ll see you there.
Citations

1. RAND Europe, Europe’s policy options for a dynamic and trustworthy development of the Internet of Things, 2002
2. Taylor, Frederick Winslow, The Principles of Scientific Management, 1911
5. Tata Consultancy Services, Internet of Things: The Complete Reimaginative Force, 2015
American International Group, Inc. (AIG) is a leading global insurance organization serving customers in more than 100 countries and jurisdictions. AIG companies serve commercial, institutional, and individual customers through one of the most extensive worldwide property-casualty networks of any insurer. In addition, AIG companies are leading providers of life insurance and retirement services in the United States. AIG common stock is listed on the New York Stock Exchange and the Tokyo Stock Exchange.

Additional information about AIG can be found at www.aig.com | YouTube: www.youtube.com/aig | Twitter: @AIGinsurance | LinkedIn: www.linkedin.com/company/aig

AIG is the marketing name for the worldwide property-casualty, life and retirement, and general insurance operations of American International Group, Inc. For additional information, please visit our website at www.aig.com. All products and services are written or provided by subsidiaries or affiliates of American International Group, Inc. Products or services may not be available in all countries, and coverage is subject to actual policy language. Non-insurance products and services may be provided by independent third parties. Certain property-casualty coverages may be provided by a surplus lines insurer. Surplus lines insurers do not generally participate in state guaranty funds, and insureds are therefore not protected by such funds. The content contained herein is intended for general informational purposes only, and should not be viewed as a substitute for legal, regulatory, accounting or other advice on any particular issue or for any particular reason.

© American International Group, Inc. All rights reserved.

AIG Bring on tomorrow