

# Global Trade 2020

*Achieving the Vision of Interconnected Customs*



INNOVATIVE TECHNOLOGIES AND POLICIES  
ARE LAYING THE FOUNDATION FOR A  
GLOBAL NETWORKED CUSTOMS THAT  
PROMOTES STREAMLINED, SECURE TRADE.



## EXECUTIVE SUMMARY

Rapidly evolving information and communication technologies are creating a more connected international trade environment that, in turn, is changing how customs agencies carry out their mission responsibilities. Specifically, increased automation and the exploding adoption of sensors and other networked “machines” facilitate the development of more frictionless trading communities.

Expanding automation has made the connections among customs agencies much more critical to the efficiency, effectiveness, and security of global trade. This includes an agency’s connections with its own government-sector partner agencies, as well as with trading partners who are manufacturing, shipping, trucking, and receiving tens of millions packages a year. It is through this process of connecting these parties and facilitating data sharing that custom and trade process efficiencies can be realized. Likewise, as technology and automation streamline complex processes, customs agencies will gain increased insight into and contextual understanding of transactions – enabling improved vetting and more effective risk assessment.

Achieving greater connectivity, while also maintaining the highest levels of security, will require the adoption of a common set of standards and formats. Advanced predictive analytics and the effective harnessing of the big data output from a more automated global trade ecosystem will also facilitate safer and more secure international trade.

Several global policy trends are also having a profound effect upon the way in which customs authorities operate.

These include:

- Proliferation of “single window” data exchanges that enable economic operators to submit regulatory documents only once
- Advent of trusted trader programs and mutual recognition agreements between collaborating nations
- More advanced and consistent risk assessment tools and technologies

Each of these World Customs Organization (WCO) SAFE Framework policy tenets shares several common characteristics with the parallel advancement of automation and technology. First and foremost, it is through the integration of technology and enhanced connectivity that all parties, especially government entities, are realizing operational efficiencies that reduce costs across the board. Likewise, with increased data sharing among customs agencies, commercial trading partners benefit from streamlined registration and validation processes performed by regulatory and enforcement agencies. Each of these advancements is expected to reduce paperwork and transaction costs at both ends of the journey. Cargo-release decisions that rely on an automated decision process, rather than manual checklists or random inspections, will make transactions faster and more predictable. All of these developments work together to give the participating entities increased visibility, more reliable scheduling and better, overall supply chain security decision-making.

As trading partners develop mutually-agreed upon data formats, standards, and protocols for exchanging data, these technological advances will not only strengthen security by accurately identifying low-risk traders, but they also will increase the efficiency of trade by segmenting risk and processing cargo on an account-based approach. Enhanced transparency will enable disparate agencies in the same nation to share data more efficiently for releasing cargo to cross its borders, as well as enable two customs agencies to rapidly and accurately share data on a common trusted trader, thus facilitating swift and secure transactions. The symbiotic relationship between the technological advances of today, coupled with an evolving customs policy landscape, is creating conditions that position global trade as the primary driver of a global economy growth and sustained prosperity.



## RAPIDLY EVOLVING INTERNATIONAL TRADE POLICY IN THE 21<sup>ST</sup> CENTURY

It would be unrealistic to expect a significant increase in manpower to address the pressing challenges facing customs and border agencies. Consequently, these agencies must leverage emerging technologies to obtain the insight needed to manage regulated parties, ensure security, and keep trade processes running smoothly. In particular, they will need to collect data that can provide transparency into companies and products, so, for example, they can identify every supplier along a supply chain, including their physical locations, leadership, financial viability, and global business relationships. Also important will be the ability to analyze and assess risk using independent, as well as internal, data sources, which will enable agencies to expedite transactions without jeopardizing product safety or border security. This will require effective information sharing among customs and border agencies to ensure they have real-time access to the most up-to-date information about entities involved in international trade.

When U.S. Customs & Border Protection (CBP) Commissioner R. Gil Kerlikowske was asked to envision what CBP might look like in 2020, he said, “I think 2020 is going to be an age of technology for us. We can only do so much in a labor-intensive environment. When you think about a CBP officer and someone entering the country, will we stamp their passport the way we did 50 years ago? I think all of that is changing rapidly, whether it’s through RFID [radio-frequency identification], whether it’s through other types of technology.”<sup>1</sup> The WCO recognizes this same need for information exchange and collaboration among customs agencies. As the first building block for “Customs in the 21st Century,” the WCO advocated the creation of a Globally Networked Customs (GNC) or international e-Customs network “that will ensure the seamless, real-time and paperless flows of information and connectivity.”<sup>2</sup> The GNC calls for customs agencies to adopt standardized approaches for collecting and harmonizing electronic information for secure and efficient exchange among WCO members.



## PROLIFERATION OF SINGLE WINDOWS

The single window concept facilitates trade by enabling economic operators to submit their regulatory documents only once, rather than multiple times, to the various government entities that oversee trade functions. The single window is an international best practice that is central to the concept of “one government at the border.” Built upon an initiative to develop an enterprise-wide approach to data collection, data sharing, risk assessment, cargo release and trusted shipper programs, this process gives agencies with “release-and-hold” authority to use the same decision-making criteria and tools for processing international shipments. Thus, single window programs serve as the foundation for leveraging emerging strategies and tools to automate and improve customs’ processes.

A prime example of government policy driving technological change in the global trade environment is President Obama’s Executive Order 13659. Issued on February 19, 2014, the Order mandates the use of the International Trade Data System (ITDS) by all forty-seven (47) U.S. agencies that manage, process, or handle trade data. At its core, ITDS is a great deal more than simply a technological upgrade; instead, it is a total business process transformation that essentially creates a one-stop shop—a single window—for all U.S. traders and trade transactions. While ITDS has been around for almost two decades in modified versions, it is intended to streamline the trade process and save time for shippers and government alike by eliminating the filing of redundant information to multiple agencies with inspection, revenue-collection and statistical functions.

Because no single U.S. federal agency can achieve its goal of a true single window on its own, EO 13659 is a mandate for government agencies to work together and with the trade community to build a single system where trade data can be submitted and gathered once, and subsequently used many times for many purposes – not just in the United States, but around the world. This notion of a cooperative system, centralized and interconnected globally, stands at the center of the exciting new world of global trade that is being transformed by new technologies such as machine-to-machine (M2M) communications, the Internet of Things (IoT), Big Data, and predictive analytics.

“ I think 2020 is going to be an age of technology for us. We can only do so much in a laborintensive environment.”<sup>1</sup>

– Commissioner R. Gil Kerlikowske  
U.S. Customs & Border Protection (CBP)

<sup>1</sup> “CONVERSATION WITH THE COMMISSIONER: R. GIL KERLIKOWSKE ON CBP’S FUTURE AND HIS APPROACH TO LEADERSHIP,” FRONTLINE, SEPTEMBER 2014.

<sup>2</sup> “CUSTOMS IN THE 21ST CENTURY,” P. 6.



## ADVENT OF TRUSTED TRADER PROGRAMS AND MUTUAL RECOGNITION AGREEMENTS

The essence of the trusted trader concept can be found in the customs-to-business partnerships section of the WCO's SAFE Framework document. Traders can be accredited by a customs authority as an Authorized Economic Operator (AEO) when they demonstrate high quality internal processes that will prevent the tampering of goods in international transport. As a result, customs will trust operators designated as AEOs, and so will perform fewer or no inspections on goods imported or exported via an AEO.

Key to the success of the GNC is the signing of Mutual Recognition Agreements (MRAs) between collaborating nations. Under a bilateral MRA, the customs administration of each nation agrees to recognize the AEOs that have been certified by the other nation as complying with supply chain security standards that are consistent with the WCO's SAFE Framework of Standards to Secure and Facilitate Global Trade.<sup>3</sup> AEOs can include not only importers and exporters, but all entities that play a role in cross-border trade, such as manufacturers, suppliers, brokers, carriers, ports, airports, terminal operators, warehouses, and distributors. With MRAs in place, customs administrations can reduce physical examination rates, including intrusive inspections, to expedite the processing of goods.

The streamlined processing also reduces the number and complexity of reporting requirements. Because MRA parties adhere to a uniform set of international security standards, customs transactions also become more uniform and predictable, saving time and costs for both customs agencies and international businesses. Equally important, customs agencies can focus more resources on unknown and potentially dangerous threats, thus mitigating risk and strengthening overall resiliency of the global supply chain.

**“Automating customs processes  
can save as much as  
\$115 per container.”**

– World Bank



## MORE ADVANCED AND CONSISTENT RISK ASSESSMENT TECHNOLOGIES

The WCO strategy also calls for agencies to adopt “intelligence-driven risk management” and build predictive capabilities that enable them to take proactive, rather than just reactive, measures to mitigate risks. This process begins in the single window when businesses are applying to become trusted traders in systems such as the U.S. Customs- Trade Against Terrorism (C-TPAT) system. Initially, assessments are focused on fundamental analyses of business legitimacy and financial solvency. In Europe and throughout most of the world (almost everywhere except in the U.S.), the initial screening of AEOs includes reviews of compliance records, including tax compliance, and any criminal activity by the company. The firm's fiscal solvency is of the utmost importance. While the company's safety and security record is also reviewed, it does not receive nearly the same scrutiny as it does in the United States. After evaluating all of these areas, a customs agency determines whether to accept an entity's AEO application.

While this first assessment of a firm is an important step, the risk assessments that occur in the transactional world of cargo targeting and screening is quite different. For example, the standardized and consistent data collection process that takes place during a firm's registration in a single window system and its application for membership in a trusted trader program will establish normative data and benchmarks on a given business. However, the risk assessment process, which occurs in real-time, when cargo crosses a border or while shipments are being screened in ports as part of cargo release, will typically entail looking for anomalies or abnormalities in and around the supply chain members or their freight.

While a single window and “one government” approach is expected to reduce paperwork and transactions costs on both ends, the biggest benefit to international shippers is the predictable movement of freight, because the use of automated decision-trees, rather than manual interventions, will make cargo-release decisions faster and more consistent. In fact, the World Bank “recently estimated that automating customs processes can save as much as \$115 per container.”<sup>4</sup> Likewise, it is very important that not only agencies within the same country, but also international partner agencies establish a mutual understanding and expectation for data exchange and the cooperation to achieve the appropriate risk-based standards to secure cargo movement using similar, if not the same, technology solutions for the screening of cargo.

<sup>3</sup> FOR EXAMPLE, THE UNITED STATES' SUPPLY CHAIN SECURITY PROGRAM IS CUSTOMS-TRADE PARTNERSHIP AGAINST TERRORISM (C-TPAT).

<sup>4</sup> NATIONAL EXPORT INITIATIVE – NEXT – STRATEGIC FRAMEWORK, MAY 14, 2014, U.S. TRADE PROMOTION COORDINATING COUNCIL & EXPORT PROMOTION CABINET.



## THE NEXT FRONTIER FOR GLOBAL TRADE AUTOMATION: M2M AND IOT

The terms the “Internet of Things” (IoT) and “Machine-to-Machine” (M2M) communication are often used synonymously; however, depending upon the context, they can have fairly different meanings and implications. For example, IoT is often thought to have a consumer orientation, while M2M may refer to business-to-business activities. For the purposes of this review, we are using the following definitions to distinguish the terms:

- 1. Machine-to-machine (M2M) communications** – connecting remote assets and devices to the Internet means that data from these assets can be processed centrally and the results distributed to wherever they are required. M2M will generate significantly more data points to identify and track products and entities, as well as provide greater visibility into supply chains.
- 2. Internet of Things (IoT) and Big Data analytics** – maximizing the interconnections of uniquely identifiable information and signals that can be embedded via computing devices within the existing Internet infrastructure. Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) and covers a host of protocols, domains, and applications. The interconnection of these embedded devices is expected to usher in automation in nearly all fields.

Currently, RFID techniques and related identification technologies are the primary deployments of M2M communications in the global trade environment. While RFID was initially developed to replace the bar code in retail and logistics applications, developments of active “smart” components will make these technologies much more than a simple identification scheme. Smart components will be able to execute an unlimited set of operations based on their surroundings and the tasks they are designed for. For instance, devices will be able to direct their transport, adapt to their respective environments, self-configure, self-maintain, self-repair, and eventually even play an active role in their own disposal.

In fact, the IoT has the potential to change the world – and not simply the world of global trade – in ways that may be more significant than the original impact of the Internet some twenty years ago. For instance, instant and constant inventory control could become the norm. Likewise, the IoT can assist in the integration of communications, control, and information processing across various transportation systems. Application of the IoT extends to all aspects of transportation systems (i.e., the vehicle, the infrastructure, and the driver or user).

Dynamic interaction between these components of a transport system enables interand intra-vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistic and fleet management, vehicle control, and safety and road assistance.

With a firm understanding of the potential benefits from the integration of automated “things,” governments and businesses are rapidly moving to adopt these new technologies. Specifically, in the global movement of intermodal containers, shipping and logistics companies experience improved inventory management and capacity planning with the help of GPS location monitoring. Companies have achieved significant benefits in the following areas:

- Improved theft prevention
- Enhanced risk management and mitigation
- More efficient auditing
- Better quality control

This is especially true for logistics providers who are moving high-value or perishable cargo and need to have a near real-time view of the location and the condition of the shipment. This additional oversight enables the shippers to provide their clients with improved service quality as well as more proactive response capabilities. For an ecosystem that is searching for more efficiency and greater security, these tools are clearly a step in the right direction.

Similarly, as the IoT and M2M communication increases, governments will have real-time access to valuable trade information that will make it easier to monitor and process the shipment of goods across their borders. Similarly, customs and border agencies will be able to incorporate predictive analytics, automated risk assessment, intelligence-driven management, and other capabilities that will further enhance the value of information sharing. Recent technological advances are lowering the cost and increasing the investment return for building a streamlined information sharing network. For example, government and commercial organizations are collecting and storing larger volumes of trade information; and advanced data analytics are making it easier to tap into structured and unstructured data for analysis and insight.

With these solutions in place, customs and border agencies can effectively tackle the challenges created by rapidly expanding global trade. They will know the physical location of suppliers and be able to identify the true source of goods or components within a supply chain; thus, reducing the incidents of counterfeit products, trans-shipments and intellectual property rights (IPR) violations. Additionally, they will be able to identify all related parties to a transaction. They will be better able to assess and mitigate product safety and supply chain risks, as well as allocate resources more efficiently based on risk assessments and predictive analytics. The ability to monitor stakeholders, products, and shipments throughout their lifecycle, while also applying intelligence driven risk management, will enable agencies to expedite transactions at the border. And by merging independent, third-party data with their own data, agencies will be able to build and maintain the quality databases needed to support a robust e-Customs network.

However, without clear and recognized standards in the digital world, the expansion of M2M and IoT technologies beyond RFID solutions cannot reach the global scale. Therefore, it is imperative that world trade associations and/or major industry players ban together for this exact purpose: to set broad standards in appropriate technical formats and approaches, to enable all parties to participate. An excellent example is the Industrial Internet Consortium (IIC) recently formed by AT&T, Cisco, GE, IBM and Intel. This consortium will enable organizations to more easily connect and optimize assets, operations, and data to drive agility and unlock business value across all industrial sectors.



## THE IMPORTANCE OF A GLOBAL UNIQUE ENTITY IDENTIFIER

Another important standards body is the Data Model Project Team (DMPT), which was organized by the WCO to establish standards for global customs data exchange. The WCO has laid out a vision and identified the elements needed for a robust GNC environment to facilitate efficient, secure trade among nations. The need for an automated customs network has never been more compelling. Likewise, the potential benefits and opportunities for building such a network have never been greater or so realistically within reach.

Unfortunately, with a rapidly growing number of MRAs, the number of bi-lateral data exchanges could make it difficult to manage information-sharing between and among these programs. Since the United States and New Zealand signed the first MRA in June 2007, the world's nations have been steadily building AEO programs and signing bilateral MRAs.

As of March 2014, 23 MRAs have been signed and 12 more are being negotiated.<sup>5</sup> As the number of MRAs increases, this will create complex information sharing problems for current systems that collect and exchange business data. Contributing to this data management quagmire is the fact that there are no globally recognized entity identifiers that can standardize the trading partners' identities and facilitate the fully automated, reliable exchange of data. Currently, data sharing programs among nations are supported by a combination of manual and automated processes—customized for each MRA partner—to ensure a one-to-one match of their business data. However, as each nation adds new MRA partners, the growing number of customized information sharing systems, along with the growing volume of cross-border transactions, will increase significantly the complexity and cost of integrating data and managing the required data exchanges.

Global customs agencies can address this challenge by adopting a universal, unique entity identifier. Unique entity identifiers already exist in several forms for individuals and businesses, such as Social Security Numbers for individuals and D&B D-U-N-S® Number for businesses. A global unique entity identifier recognized and adopted by all MRA partners would:

- Provide one-to-one entity matching to enable the accurate exchange among the diverse databases and systems of MRA partners
- Facilitate more efficient and consistent interactions between trading parties and regulators, particularly among multiplying MRA partners
- Support entity resolution and validation for ensuring the accuracy, timeliness, and completeness of information
- Support a single window for information sharing among agencies with customs- and border-related missions
- Support data analytics and other measures for deep insight and predictive analysis
- Provide a foundation for a master entity crosswalk that could be used by all WCO members

Although a global unique entity identifier is simply one data element in what looks to be a sea of data elements, it is critically important to the data exchange process and the larger vision of an inter-connected global customs ecosystem. With globally accepted data standards and technology platforms in place, customs organizations can create an e-Customs network that provides transparency into international supply chains, markets, trade entities, and cross-border transactions.

<sup>5</sup> COMPENDIUM OF AUTHORIZED ECONOMIC OPERATOR PROGRAMMES: 2014 EDITION, PP. 131-132. IN ADDITION, 53 AEO PROGRAMS ARE OPERATIONAL AND 10 MORE ARE BEING LAUNCHED (PP. 133-134).



## CONCLUSION

Recent policy and programmatic developments among customs agencies, coupled with M2M, IoT, and other advanced technologies, are dramatically altering the international trade landscape in ways that will introduce and eventually institute greater automation and more effective data exchange. For example, newly shifting trade alliances, reduced trade barriers, increased global specialization, and other changes are spurring a significant increase in the number of businesses, ports, nations, and goods involved in world trade. These developments will increase the complexity, safety concerns, and difficulty of moving goods across borders quickly and securely.

Securing the safety of the global supply chain is a priority shared by government organizations around the world that regulate the cross-border flow of goods. It is a careful balancing act that requires a dual focus: to promote and facilitate legitimate commerce, while simultaneously mitigating supply chain risks. The processes that enable government agencies to balance these dual priorities rely on data, cross-border standards, widely embraced policies, as well as cutting-edge technologies that are dramatically changing the global economy.

Programs such as single window, trusted traders (AEO), Mutual Recognition Agreements and automated riskassessment platforms will play an essential role in modernizing global trade. However, many believe that the IoT will produce an even greater game-changing impact by connecting everyone and everything in seamless networks. People, machines, natural resources, production lines, logistics networks, consumption habits, recycling flows, and virtually every other aspect of economic and social life will be connected via sensors and software to the IoT platform via M2M connectors. In turn, the IoT and M2M network will continuously feed big data to every node – businesses, homes, vehicles, etc. – in real time. “At the same time, large stores of data will be analyzed with advanced analytics, transformed into predictive algorithms, and programmed into automated systems to improve thermodynamic efficiencies, dramatically increase productivity, and reduce the marginal cost of producing and delivering a full range of goods and services to near zero across the entire economy.”<sup>6</sup>

The world’s customs and border agencies have long known that the growing complexity of global trade requires more effective mechanisms for sharing and analyzing trade data. The cost of cross-border transactions, as measured in both time and money, will rise dramatically. The IoT and M2M communications are not futuristic, aspirational technologies. They already exist in the devices, sensors, cloud infrastructure, and data and business intelligence tools widely used today. Rather than thinking about the IoT in terms of everything – such as billions of devices and sensors – global customs agencies and their commercial trading partners should focus on applying IoT to what matters most to each of them. And instead of thinking about the massive amount of data being produced, they should think about how the right piece of data can provide value to their operations.

How might government and industry get started with this thinking or approach? One step would be the adoption of a global unique entity identifier, which is key to facilitating efficient information exchange and would enable customs and border agencies to tap into these new, game-changing technologies more effectively. The urgency to address mounting challenges grows. Customs and border agencies have a unique opportunity to streamline information sharing and improve collaboration for expedited, secure trade.

“Fitting sensors and tags to products will generate even more data than are currently being created and capture. Beyond storing, securing and analyzing these data, companies (governments) should also consider how they manage the commercial sharing of the data as the IoT becomes a platform for trading information.”<sup>7</sup>

<sup>6</sup> “THE THIRD INDUSTRIAL REVOLUTION: HOW LATERAL POWER IS TRANSFORMING ENERGY, THE ECONOMY AND THE WORLD”, JEREMY RIFKIN, SEPTEMBER 27, 2011

<sup>7</sup> THE ECONOMIST – INTELLIGENCE UNIT: “THE INTERNET OF THINGS BUSINESS INDEX: A QUIET REVOLUTION GATHERS PACE.”

## ABOUT DUN & BRADSTREET

Dun & Bradstreet supports efficient global commerce through increased transparency of all members of the trade ecosystem – from manufacturers, shippers, and truckers to custom agencies around the world – and provides a mechanism for analyzing and sharing trade data. Through the use of Dun & Bradstreet’s global unique identifier – the DUNS Number – and active information sharing among customs and border agencies globally, Dun & Bradstreet can help facilitate expedited, secure trade among nations. A series of complementary services that leverage the company’s global data assets, technology, and predictive analytics, can not only help a customs organization more rapidly “reduce its haystack” and achieve greater trade facilitation, but also simultaneously “find the needle” and satisfy the need for enhanced security.



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