Enhancing Visibility in International Supply Chains: The Data Pipeline Concept

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ABSTRACT

With increasing global trade and growing emphasis on security, enhanced information sharing between actors in global supply chains is required. Currently, the data about cargo available in the supply chain does not provide a timely and accurate description of the goods. To solve this data quality issue, data should be captured upstream at the point where goods are packed for transport to the buyer. Without ICT, it was not possible to get timely access to the original trade data. The data pipeline concept is an IT innovation to enable capturing data at the source. The data pipeline accesses existing information systems used by the parties in international supply chains. This paper explores the data pipeline concept and the benefits that businesses and governments could obtain from such an innovation. This study also identifies the need for a public-private governance model that has to accompany the technical innovation.

Keywords: Business-Government Interoperability, Data Pipeline, Data Sharing, E-Government Infrastructure, Supply Chains, System Based Approach

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INTRODUCTION

The systems used in international trade have developed since the eighteenth century to cater for general cargo and paper-based transactions (Van Stijn et al., 2011). Since the advent of the sea container in the twentieth century, the carrier has entered into a so-called contract of carriage with the shipper concerning the transport of goods in a container, due to which the actual goods are hidden from view. Outsourcing, consolidating cargo and multi-modal transport chains have allowed the identity of the true seller or sender to be clouded and contractual terms to be complicated. Currently, carriers and importers are being asked to make legal declarations about goods they have never seen and the documents containing crucial information can lag three days behind the goods. Due to the complexity, the buyer and seller engage with a range of logistics and other service providers to handle the processes on their behalf resulting in a lack of visibility of events, costs and assurances. Given the increase in international trade, and the substantive risks involved, border management has also increased in complexity, and can cause time delays, cost increases, as well as reductions in the competitiveness of supply chains (Holloway, 2010). For border agencies such as customs to perform their functions they need accurate supply chain information to assess risks and to make intelligent decisions. For these reasons, supply chain visibility is consistently ranked as a top priority for internationally operating businesses and for governments that have to supervise goods flowing across borders (Aberdeen Group, 2006).

To minimize safety, security, legal compliance and commercial risks and to improve the effectiveness and efficiency of both business and government operations, it is important to have a genuine and complete packing list of the goods that are packed in a container, preferably matched with the underlying commercial transaction (i.e., a purchase order). This data has to come from the source. To ensure that the documents contain reliable data on the consignment, the first point where such data can be made available in a digital format could be at the point where a consignment is completed (Hesketh, 2010). The consignor needs to ensure that the order of the buyer matches the packing list, which in turn matches the invoice (i.e., the logistics information needs to match the commercial information). The packing list should match the shipping note that matches the contract of carriage that matches the way-bill that feeds the manifest. If the packing list is wrong, then they are all wrong, which may harm the interests of all the parties involved (Hesketh, 2010).

The best party to provide quality information about the goods being transported is the original seller or another actor that ‘packed the box.’ However, for commercial reasons, parties often do not want to let the next party in the chain know where the goods came from originally, i.e., who the producer is, in order to prevent that they are bypassed by another party who seeks contact with their partners directly. Therefore, the information that finds its way into the transport documents – and from there into the customs declarations – is often not from the originator; not from the actor that actually knows which specific goods are being shipped. As a consequence, buyers, sellers, customs and other parties in the supply chain have to manage the supply chain with second-hand information that is filtered, altered and likely to be inaccurate (Hesketh, 2010). This current situation is visualized in Figure 1.

In paper-based procedures, on average 40 documents are required to import or export one single container, which causes significant delays and extra administrative costs for businesses. Information elements upstream in the supply chain (e.g., the purchase order, an accurate description of the actual consignment, and transport terms (i.e., Incoterms) need to come together and be verified between buyer and seller (Hesketh, 2009). At that point everything relevant to the consignment entering the international trade supply chain for export, transport and import should be made available to the appropriate actors. If the full amount of data related to the goods and relevant parties that
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