# I-DELTA Application Scenario: Invoicing and Proof of Delivery

**Current Conditions**

Within the European Union suppliers are not subject of VAT, in case they trade goods in EU member states. The trader is exempted from VAT taxation, whereas the buyer is in charge of declaring the VAT according to local national legislation, but this can only be done, if the corresponding invoice is properly issued. In order to avoid tax fraud because of unjustified VAT exemption, German companies, for example, in addition are asked by law to issue and register a written confirmation of the receipt of the delivered goods by the receiver. This confirmation has to include the name and address of the receiver, the volume of the delivered goods, the delivery date, issue date of the confirmation as well as a signature and a proof that this confirmation has been issued by the receiver of the goods.

Non-compliance to this law can have serious consequences, ranging from additional claims in relation to the non-declared VAT down to criminal prosecutions. Trading companies therefore have paramount interest of properly processing and transparent storing of invoices and proofs of delivery in order to be prepared to stand related audits.

**Current Challenges**

Today, the exchange of invoices and proofs of delivery within a supply chain is still mainly paper based, though not always necessarily asked for by national legislation (e.g. for the receipt confirmation in Germany). In order to allow the public tax authorities to get an overview of tax relevant company activities, Germany as well as all the other European countries have established a comprehensive reporting scheme for this. This asks, among others, for a regular notification of the turnover with each business partner to these authorities. But since this is usually done only periodically and does only map bi-lateral company relations, complex scenarios of multi-lateral business relations are used to evade tax or to conceal tax relevant transactions as long as possible.

In addition, standardised electronic interfaces are still lacking in order to allow smoothly exchanging delivery proofs along the supply chain, because of the dynamics of the trade, the many stakeholders and the various information systems involved in it. The consequences of this are manual “repair” efforts to compile and register invoices and delivery proofs for their gapless documentation. These manual interventions are of course, prone to errors, which could lead, as described above, to series financial and penal consequences.

Even in case of static supply chains and business relations the integration of corresponding processes and data require the implementation and maintenance of several (ERP systems) interfaces, which is in particular difficult to be borne by SME and often results in multiple storage of documents in a supply chain (at minimum, at both of the supplier and receiver sides).

This surely can/will lead to inconsistent data stocks, which in case of legal disputes, for example, are not suitable to properly and correctly reproduce the actual state of affairs

**Conclusions**

In order to cope with the described challenges (1) standardised, efficient interfaces and (2) consistent cross-company data storage provisions for allowing and supporting auditing efforts of public authorities within supply chain goods exchanges are required.

**Proposed Solution**

The complexity of tax relevant transactions along a supply chain requires novel (IT) solutions in order efficiently ensuring company compliance. The deficits identified above are mainly due to a missing, uniform exchange of all tax relevant documents (invoices, delivery proofs). Distributed Ledger Technology (DLT) represents a promising approach to interlink the various actors in the taxation realm (tax authorities, companies and auditors). The de-centralised DLT data store thus eliminates all “single points of failure”, which could range from HW failures down to unilateral manipulations of data. In addition, Smart Contracts support the integration of tax logics and rules into the DLT. These also allow for the monitoring of any exchanges between supply chain stakeholders in order to, e.g., automatically check the compliance of incoming documents or to get, in quasi real-time, an overview of current turnover balances.

In this context of document exchange and storage, the DLT takes on the role of a middleware function with its own business logic. Different to “traditional” middleware DLT represents a de-centrally executed business logic, not run by a single instance. The use of such a middleware thus will allow a standardised document exchange and will correspondingly support the development of future document exchange interfaces according to the given standard of this middleware. This results in efficiency gains, requiring the participating companies to develop and maintain related interfaces only once instead of implementing and maintaining several interfaces, depending on the various business partners. All DLT participants provide also for access to only one, unambiguous and consistent data storage, which can be consulted in case of audits or legal disputes.

Such change of paradigm towards a de-central middleware represents the challenge, particularly for SMEs, to indeed to perform the required development of interfaces. Even hidden champions among those SMEs do not provide for the sufficient capacities for doing this rapidly. The need to still support the exchange of paper documents, e.g., during the transition phase towards full DLT, asks for a generic, manually operable interface (e.g. a Web-service). In order to reduce the overhead and risks of manual interventions such a service must allow for an AI-based document analysis in order to intelligently extract any tax relevant information in documents and to transform them into the DLT.

This analysis must clearly go beyond pure optical character recognition (OCR), but has also to cover the substantive analysis of differently formatted and structured documents, whose diversity is due to the varying characteristics of companies and branches.

Based on the above considerations, the following refinements can be made from a specific tax (research) point of view:

**Value proposition**  
Tax administrations, auditors and other stakeholders are already demanding (near) real time information from businesses in order to assess and support their VAT(/POD) liabilities and deductions. Blockchains could greatly facilitate the speed, accuracy and ease of collecting this data – thereby improving the quality of VAT(/POD) handling compliance while reducing the cost of enforcement. A major development that could contribute to the effectiveness of real-time reporting is the use of a blockchain based framework for improving indirect tax compliance and auditability. Authorities are already asking for more transparency in TAX processing in general.

**Possible research area:**

The invoice is the most critical VAT document. A blockchain-based regime will be likely to require every valid “VAT invoice” to have a digital fingerprint (derived through the VAT blockchain consensus process). The fingerprint would immediately identify that the block under scrutiny is permanently linked to the previous and subsequent blocks. The entire history of the commercial chain (forwards and backwards from this transaction) could be followed. This scrutiny could be done by a tax official, by a robot (AI/robotics), or by an auditor.

Anyone connected to an approved tax-auditing program could immediately pull up the entire commercial (logistics) chain for an item from a valid invoice and execute additional checks on the (TAX) validity of the business transaction, such as:

* Check/confirm supplier fiscal data,
* Check/confirm customer fiscal data,
* Check/confirm VAT determination/category (%, high, low, …),
* Check/confirm and get notified if a business partner is traced to a VAT loss and/or has been involved in “carousel movements” of goods?

**Core Technogy research**

Distributed Ledger (Blockchain) Technology will be utilized to store and transfer VAT related documents („VAT invoice“ data, „Proof Of Delivery“ data, ….) in a secure manner, verifiable by all (permissioned) parties.

**Possibility for Integration of multiple digital technologies (research topic):**

Possibility to integrate Artificial Intelligence technology for finding anomalies in TAX handling (deviations from common rules).

**Benefits**

* Streamline VAT(/POD) management, providing VAT(/POD) document visibility across all permissioned participants by implementing a real time and simplified system for exchanging VAT(/POD) related information.
* Provide digital validation (checks) of VAT (/POD) related transactions/documents by permissioned participants
* Facilitate real-time exchange of VAT(/POD) related documents/information by the permissioned participants
* Streamline VAT management, providing VAT(/POD) document visibility across all permissioned participants by implementing a real time and simplified system for exchanging VAT related information.
* Record and track VAT(/POD) related actions taking place in the business flow

**KPIs**

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