Presentation of SmarTrack, a supply chain analysis solution

After a period of market monitoring of roughly three years, and discussions with several industry incumbents across different sectors (e.g. aeronautical, space, defense, manufacturing), we identified a **widespread need for an end-to-end traceability solution allowing an improved and multi-layer analysis of industrial supply chains**.

In a context of increasingly frequent supply chain disruptions, demand shocks, as well as growing environmental concerns and regulatory pressure, peer industry groups, whether competitors or partners, raised a multitude of pain points with respect (but not limited to) **carbon footprint calculation, ESG reporting (e.g. DPP[1]), supply chain robustness' assessment, COC[2] issuance**, etc. It is our opinion that all these issues can be addressed by means of a solution enabling cross-enterprise data analysis.

Data analysis methods have been widely popularized over the past 10-15 years. However, their potential remains dramatically untapped insofar as, with few exceptions, current applications only leverage in-group, proprietary data. On the other hand, since supply chains intrinsically bypass the limits of single enterprises, their analysis requires cross-firm data exploitation, to ensure accuracy and thus complete results.

Our market research thus revealed the urgent need for a **technical solution allowing cross-enterprise data analysis, while ensuring the confidential treatment of sensible data**. Indeed, while shared database infrastructures are already in use, such technologies systematically rely on trusted third parties, controlling the data and ensuring their protection. This model implies risks in terms of corporate dependency, cyber security, etc., or a serious limitation in case the enterprise chooses to only work on its own proprietary, in-house data, stored and secured in a direct manner.

Our solution, named SmarTrack, aims at filling the gaps by leveraging a **combination of public blockchain technology and fully homomorphic encryption**[3]. Public blockchain provides for a shared, agnostic infrastructure for data storage and analysis, that none of its users can directly control or own ; homomorphic encryption allows to perform data analysis while preserving the end-to-end confidentiality of sensible information.

SmarTrack connects to the information systems of participant industry groups, and does not require any modification of internal IT structures. The application retrieves information through APIs and performs the analysis without decrypting the data. The results of the computations are only accessible for specific entities, having either contributed through data sharing or being whitelisted, e.g. for regulatory reasons. For example, each participant to a supply chain would share the information to calculate the carbon footprint of their own products ; the system would then allow each firm to obtain the results of the computation for its goods (only), by taking into consideration the data coming from all upstream suppliers, without disclosing them. Way beyond this simple example, SmarTrack works as a plug&play top-layer platform and offers opportunities for a variety of use cases with respect to supply chain analysis.

We believe our solution could substantially **facilitate business continuity and regulatory compliance**. Its impact could encompass different industries and its technical foundations could be leveraged in many ways, opening the door for co-development opportunities and further innovation.

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[1] Digital Product Passport
[2] Certificates of Conformity
[3] A recent and ground-breaking cryptography technique. For more info : https://www.zama.ai/introduction-to-homomorphic-encryption