

A Blockchain-based Value Added Tax (VAT) System: Saudi Arabia as a Use-Case

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Abstract—Businesses need trust to confidently perform trade among each other. Centralized business models are the only mature solutions available to perform trades over the Internet. However, they have many problems which includes but are not limited to the fact that these create bottleneck on the server as well as requires trusted third parties. Recently, decentralized solutions have gained significant popularity and acceptance for future businesses. The wide acceptance of such systems is indeed due to the trust management among various untrusted business stakeholders. Many solutions have been proposed in this regard to provide de-centralized infrastructure for various business models. A standard solution that is acceptable to the industry is still in demand. Hyperledger umbrella Blockchain projects, that are supported by IBM and many other industry big players are gaining popularity due to its efficient and pluggable design. In this study, the author present the idea of utilizing Blockchain to design a Value-Added Tax (VAT) system for Saudi Arabia's newly introduced tax system. The reason to select this business model for VAT is twofold. First, it provides an untampered distributed ledger, which cannot be deceived by any party. Each transaction in the system cannot go unnoticed by the smart contract. Secondly, it provides a transparent record, and updates all involved parties regarding each activity performed by stakeholders. The newly proposed system will provide a transparent database of VAT transactions according to our smart contract design and at each stage of supply chain, tax will be deducted and stored on peer-to-peer network via consensus process. The author believes that the proposed solution will have significant impact on VAT collection in the Kingdom of Saudi Arabia.

Keywords—VAT; hyperledger; blockchain; consensus; decentralized network

I. INTRODUCTION

Value Added Tax (VAT), is a self credit mechanism of indirect accumulative tax related to consumption of goods or services which is imposed on the end user as chain of business [1], [2]. VAT is collected from individual customers and is paid back to the Government. VAT collection is an important process of a state administrative authority that allows a government to generate revenue from active honest tax payers and if the tax payment is not made properly then the dishonest payers may reduce the tax liabilities to their own level of choices. Consequent to non compliance in tax payment and tax fraud, countries and governments receive losses in tax collection [3], [4]. It has also been observed that significant

time and resources are consumed during the audit when the tax gap is identified.

VAT is implemented at the stage of production and distribution to increase the inland revenue. The noncompliance of VAT implementation results in the VAT gap [5] that represents the difference between estimated tax and actual tax collected. There are a number of reasons for the VAT gap which may include evasion, fraud, bankruptcies, and insolvencies relating finance, etc [6].

In Saudi Arabia, VAT is introduced as a standard rate of 5% with effect from January 2018 (Rabi Al-Thani 14, 1439) with exception of some goods and services. The sectors for which VAT is avoided includes health, education and transportation [7]. However, VAT is implemented on services and things like healthcare and treatment [8], medicine and medical equipments, import and exports [9] clothes, fuel i.e. food, petrol, & diesel, utility bills and hotel rooms etc. Failing to pay VAT, General Authority of Zakat & Tax of Saudia Arabia may like to impose appropriate penalties on taxpayers for violating VAT rules as set forth by the Law or implementing regulations. However, there are difficulties due to the manual implementation of the tax collection procedure which cannot be neglected [10].

Generally tax invoices are proof of tax collection. A tax invoice is a proof that the seller has collected the VAT from the buyer. A VAT previously paid by a buyer of good is partly recovered from the next buyer of the same good and services. During the VAT reporting period, the difference is calculated among tax invoice paid and tax invoice received. Only the taxable person for VAT purposes can generate tax invoices [11].

A. VAT Mechanism as Adopted by Saudi Arabia

There are 135,906 VAT registered businesses in the Saudi Arabia. Upon purchase of taxable service or goods, buyer pays VAT to the seller along with price of the service or good. This information is reflected in the invoice issued by the seller. The buyer can then use this invoice to show he/she is an active tax payer and further to reduce her overall tax where required.

At the point when a VAT-enlisted business offers a decent or benefit, it charges – accepting a standard case – an additional