CAN GST IN INDIA RIDE THE BLOCKCHAIN REVOLUTION?

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ABSTRACT:-The much awaited Goods and Service Tax was introduced in India in 2017 under the BJP regime. It is indeed one of the most progressive financial system reforms to be introduced in the Indian economy. The law is made so as to incorporate and include all large and small Indian businesses in its purview. It is designed in such a way that businesses which had never ever paid taxes in history were all compelled to abide by the law. The government thereby managed to ruffle many an industrial feather! The tax law according to experts is excellent in its drafting and aims for maximum benefit to businesses as well as consumers, and at the same time, increasing the government revenues.

However, the systems and infrastructure backing the implementation of the GST was fraught with many issues. Hence, the transition from the older tax system to GST was not seamless. In fact, small and medium businesses were totally overwhelmed with the compliance procedure which is byand large digital. This paper tries to identify and address the problems in the GST system. This paper in theory, proposes a transition of the current system of GST network to Blockchain technology. Blockchain is a forward looking, highly sophisticated and secure distributed record keeping system which will help in the storage and analysis of large amount of taxpayer database which can be traced down to all past transactions. The system would include all the entities involved in the transaction and hence accord transparent and tamper free transactions. The model is based on consensus and hence all the transactions will have to be validated and approved of, by all the members of the group before the transaction. It is a system based on trust and autonomy which will make the life of at taxpayer easy and the process of tax collection efficient. The paper explores the solutions that Blockchain can provide in dealing with the current problems of GST implementation.

KEYWORDS:Block Chain, Goods and Services Tax, Validation, Smart Contracts, Electronic Ledger, Tax Evasion, Input Tax Credit, Block, Hash, Encryption

INTRODUCTION:

On July 1st, 2017, the Goods and Services Tax was rolled out in India. This rollout is considered to be the biggest indirect tax reform to have occurred in the Indian economy since after independence. Taxes such as Central Excise, Service Tax,Value Added Tax etc. are all types of indirect taxes. The onus of the tax payer is to simply collect this tax on behalf of the government and pay it to the government. GST is about to change the way business is done in India(Poddar, 2017).

Multiple indirect taxes which existed in India were eradicated and in its place one tax was implemented- the GST. This was intended to make the life of a businessman easy. It also aimed to remove the complexities for foreign companies intending to do business in India. It was aimed to be a major reform and positive move, but it seems that in India the whole implementation process was not well thought out and hence, the government is facing some amount of resistance on account of GST implementation. This paper aims to understand the technical and operational problems with respect to implementation (From the government's point of view) and compliance(from the business' point of view) of GST. The solution to these problems lie in devising a more efficient and comprehensive system of tax collection which can only succeed with superior technology. The use of Block chain technology has been explored as a viable solution to the problems of GST.

THE NATURE OF GST:

GST is an indirect tax, which means that it is not levied directly to the income of individuals but added to the prices of goods and services which inturn increase the Maximum Retail Price of the goods or services. This tax in the form of increased MRPis then transferred by the companies/businessmen/traders to the central or state government. It is a comprehensive tax, the implementation of which has lead to the abolition of 19 other indirect taxes which businessmen and traders had to pay earlier. It is a value added tax. Hence, tax is imposed on every value addition and so tax will be levied at the end of every sale. GST is a destination based tax rather than the origin based tax which existed earlier. It is imposed on the distribution of goods and services(ClearTax, n.d.-a).

GST in India is applicable in three ways, namely:

- *SGST – the Good or Service Tax collected by State Government*
- *CGST – the Good or Service Tax collected by Central Government for an intra-state transaction*
- *IGST – the Good or Service Tax collected by Central Government for an inter-state transaction.*

Advantages of GST:

- Ease of compliance: It is expected that GST implementation will remove complex and multiple taxes and an efficient digital system will back the processes to be followed.
- Uniform taxes: The tax rates will be same across the country and hence, there will be no confusion for intra state businesses. Differential pricing will be eliminated and consumers will benefit.

- Cascading effect of taxes will be removed: Tax credits and payments will become seamless and hidden costs of doing business would be removed.
- Reduction in costs: The costs of locally manufactured goods and services would go down and this would augur more sales.
- For governments: GST will increase tax collection in a simpler manner and compliance issues will be resolved as every businessman, small or big would be in the GST net. The cost of tax collection will decrease and hence it will lead to a more efficient revenue collection. Digitisation of the whole process will lead to easy compliance.
- Overall tax burden of the consumer and businessman will reduce.

So to put it in a nutshell, the GST was implemented for the greater good of Indian businesses and consumers. However, things did not go according to plans. The government faced a lot of criticism and wrath from small and medium scale businesses after GST was launched. The following were some of the points of contention:

- Amongst the Asian countries, the GST rates in India are the highest and there are four rates – 5%, 12%, 18% and 28%. This was heavily criticised by laypersons and experts.
- Businesses which have product or service categories falling in different rates are finding it difficult to make invoices.
- Compliance has to be done digitally and returns are to be filed every month. This is a big hindrance to those businesses which are not digitally savvy. Even those companies which were earlier filing service tax returns without a hitch feel the filing of GST to be a tedious process. The whole process is online which adds to the problem(ClearTax, n.d.-b).
- Small businesses that have a small turnover and need not pay GST face trust issues. Buyers demand bills from even those sellers who are exempted from GST. Without proof of certificate of GST exemption, small shop owners find themselves stranded and immobile.
- The E-Commerce businesses were also left in a lurch as they have to collect tax at source from the sellers. This has drastically affected their working capital. The GST council has fixed a rate of 1% TCS for E-Commerce companies.
- There were issues in the nationwide implementation of E way bills. Free movement of goods and services across the country is the main objective of GST. But the GST software to be unable to process mass requests to generate E way bills on day one of implementation. This created a lot of mistrust amongst the business community. The purpose of E way bill is to avoid tax evasion and tracking of goods via RFID. Transit delays can be reduced because of reduced number of checking points for goods in transport. It is also aimed at reducing paperwork as E way bills are to be generated digitally. It is also aimed at reducing India's cost to GDP ratio which is higher as compared to other Asian countries. However, E way bills have not been accepted smoothly across the country as very less time was available for understanding the intricacies of the E way bill and there was countrywide upheaval because of which the government had to roll back the system for three months in February when it was launched and re launch it in June 2018. Another problem is that for consignments of less than value of Rs. 50000, an E way bill is not required. Many small scale traders are still taking advantage of this loophole("Ewaybill - What is e-Way Bill? E way Bill Rules & Generation Process Explained," n.d.).
- The initial process laid out by the Income tax authorities was full of glitches and hence the government had to change the approach from a stringent one to a accommodating one wherein certain industries and businesses were given a leeway of filing returns every three months instead of one month, a rollback on GST on certain items, exempting businesses under twenty lakh turnover from registration, cancellation of Eway bill etc. These actions seemed to dilute the effective implementation of the tax regime and people found more ways to evade ridicule and rebel against GST.

So, even though the government implemented a forward looking progressive tax reform, the small and the medium scale businesses felt shortchanged and harassed. So the question that arises is, that what went wrong?

In India, it seems that the problem is not about the tax itself, but in implementing it and the ability to comply with it. Another major problem is the mentality of people to evade taxes.

REVIEW OF LITERATURE:

GST though being a progressive reform, faces many operational and compliance hurdles in India.

The trasnsition from the original system to the new system is one of the major challenges that the businesses are facing. The GSTN network which is termed as the backbone of the whole process has to be extremely robust and powerful. A huge amount of data will be collected and stored and the challenge is to process this huge database(Mittal, 2016).

The businessmen and traders were not prepared for the implementation of GST in terms of their IT systems, supply chains and legal matters. Nor were they prepared in terms of managing their working capital, fund flows and cash flows(ClearTax, n.d.-b).

There was lack of clarity in the rules and regulations in terms of categorisation of goods, place of registration, E way bills generation and tracking of goods while in transit. It was not clear who would be spending towards the infrastructure required for tracking systems for trucks.

There was a problem of increased compliance as more number of returns had to be filed. Every business would have to file a minimum of 37 GST returns in a year for proper compliance. If this is not done, they would lose out on the input credit(Saraswathy, 2017).

Inadequacy of the IT systems was the biggest problem. The government needs to work vehemently towards adequate IT. Another problem was the confusion amongst the people within the Income tax department as regards with certain rules and regulations. There was lack of trained staff who could address the various questions and problems of the business community nationwide. However, that in large part is being rectified by the government through various awareness camps and workshops(Saraswathy, 2017).

There is a big dearth of skilled resources with the industries as well as the government who can effectively handle the compliance and the implementation processes respectively.

Besides this, many businessmen have found innovative ways to evade GST. In Delhi, the most common practice to evade GST is 'Bill to one and shift to another.' This is a racket involving fake invoices which are generated in favour of parties who want to take input credit, while those who do not need it, charge a premium(Siddhartha, 2018).

One of the biggest practical issues that the small and medium business community is facing is the mismatch between GSTR1, GSTR2 and GSTR3. GSTR 1 is for supply of goods. So, when a businessman supplies goods and raises and invoice, it will be recorded in GSTR1. GSTR2 is for inward goods. When the goods are received, then that will be recorded in GSTR2. So, from the details of GSTR2, the government can check the details given in GSTR1 by the supplier. So in a nutshell, GSTR1 records the details of all sales and GSTR2 records the details of all purchases. Every month, the businessman has to file his return through GSTR3 which will contain the monthly summary of sales and purchases and the tax liability. The problem which cropped up is the mismatch between GSTR1 of suppliers and GSTR2 of buyers. In this case, the input tax credit to be disbursed would be incorrect. In case there is a mismatch, GSTR3 cannot be filed and hence, it will attract penalty and interest on the unpaid amount of tax. Besides, the next month's GSTR1 cannot be prepared. This created a lot of ruckus and disgruntlements from the business community. As a stopgap arrangement, the government has revoked the filing of GSTR2. Hence, for the time being, the matching between sales and purchases is inaccurate. Eventually, the errors in GSTR3 will have to be rectified. The government needs to come out with a permanent solution to this issue because otherwise, some businessmen will try to take advantage of this loophole and claim extra input credit which is actually not due to them. The procedure to recover it will be cumbersome and full of ruckus(Babar & Sikarwar, 2017).

It can be deduced that the problems are more technical in nature. In principle, GST is the ideal way to implement indirect taxes but the process has to be seamless. This can be done if the technology backing GST is so superior that the compliance becomes easy and the ways to evade taxes are plugged.

So what is the solution to all this? Obviously a full proof system, which can be adapted by all, and which automatically removes the glitches and is so secure, that one cannot make any fraudulent entries. The system should be all encompassing, that is every registered business whether or not coming under the GST purview should be in the database and even if the business is dealing with a non registered entity, that record too will be maintained and reverse tax liability will be automatically calculated. So basically, the need of the hour is a system which can store, manage and analyse huge amount of data which cannot be tampered with, which is extremely transparent, quick and efficient. A system of recording transactions in a transparent manner, which can be verified duly by the buyer, seller, banks and government (all parties to the transaction) is required. Any change in the records, has to be duly approved by all the parties, and cannot be made by any one party, only then the change can be effected in the system, and all concerned parties should be able to go through all the past transactions with each other in a simple and transparent manner. Dramatic change in the approach to taxes and its collection is required. For this the beginning block has to be digitisation. The digital age will bring about a change in the relationship between taxes and taxpayers, the way we pay taxes and how we submit and store information. The potential of digitizing taxes is full of promise. The tax authorities want comprehensive data of the taxpayers and businesses. Their purpose is to analyse this information digitally, better compliance and a cost effective collection process. In the same way taxpayers want more transparency and an easier process for payment of taxes.

Block chain has the ability to procure and deliver real time information from various sources and layers to a very large number of people on a national as well as international scale. The topic of applying Blockchain technology to taxation process was discussed at the World Economic Forum in held at Davos, in 2016 and 816 observers and technology specialists were asked when they think their respective governments or tax authorities would start collecting taxes using Blockchain; the average response was around 2023 or 2025("pl_Blockchain-technology-and-its-potential-in-taxes-2017-EN.pdf," Delloite Report 2017)

BLOCKCHAIN TECHNOLOGY:

The concept of Blockchain has taken the fancy of a lot of people and the technology became famous because of one of its most popular usecases that is, the Bitcoin. However, the applications of Blockchain go much beyond cryptocurrencies.

The block chain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value(Tapscott & Tapscott, 2016).

Basically, it is a database which has to be validated by a wide community (or rather all the parties involved in the transaction) rather than just one central authority. The collection of records can be transparently viewed by all the entities who are parties to the records instead of a central authority like bank or income tax department which hosts the data on the server(Martindale 2018). Since this type of large database can never be managed manually, that is where computers joined in a peer to peer network would be required. A variety of information can be stored on the blockchain including tax related data of the citizens of a country. When a peer wants to add a piece of data to the ledger other peers must validate the correctness of the data. If that happens then the data is added to the block. Every block has something like a digital encryption (digital fingerprint) which is a unique hash of the previous block. When a new block is added, it contains the information and hash of the previous block and thus the different blocks are linked through unique chain of hashes. The technology removes the need for a central authority or regulator because the system is designed to be self regulatory. Each party can transact directly with each other on a secure protocol. The tax authority would also be a party on the peer network and not a controller. Altering the information stored on the block is not possible without changing the hash of the block. And this hash cannot be changed unless all the parties validate the change. So in a way the system becomes immutable.

Characteristics of a Blockchain:

1. It is based on consensus.
2. It is secured by cryptography.

3. It is chronological and this chronology cannot be altered retrospectively or actively once the transaction is recorded.
4. It has a time stamp.
5. All the information is recorded digitally so minimum paper work.
6. There are fewer third parties involved in the peer network.
7. It is self regulatory and does not need a centralised regulator.

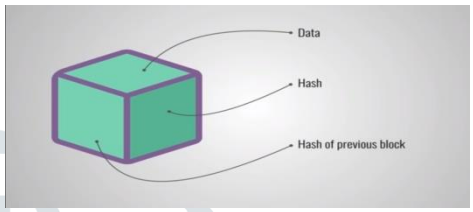
Steps in Blockchain:

1. The transaction is done.
2. All the members of the chain get the information regarding the same.
3. The members check all the information on the operation.
4. If the information is found satisfactory and correct, every party validates it.
5. The network of users accept and confirm the new block which is created.
6. The block is added to the chain.

The composition of a block:

Every block consists of three parts:

1. Data
2. Hash of the block
3. Hash of the previous block



Source:(https://www.digitaltrends.com/computing/what-is-a-blockchain/)

Data:

Data consists of the parties involved in the transaction, value of the transaction or any other terms and conditions with respect to the transaction. If we consider GST as a point in study, each block will consist of information (name, address etc.) of the supplier and buyer, value of the transaction and maybe terms of payment, delivery etc.

Hash of the block:

As mentioned earlier, it is like the digital signature of the block, a highly encrypted password which is unique.

Hash of the previous block:

Each block also consists of the digital signature of a previous block.

The hash of the block basically contains all the information of the block and is unique to each block. If something on the block changes then the hash will also change. Let us assume that there are 3 blocks linked to each other. The first block is called the genesis block because it is the beginning block. The second block consists of the hash of the first block and its own hash and the third block consists of the hash of the second block and its own hash. So basically the third block points to the second block and the second block points to the first block. Now if any change is made to the second block, its hash will change. Therefore, its link with the third block and subsequently all other blocks becomes invalid. So this type of tampering is not possible.

If at all a change is required to be made to the block, then every member of the peer group should validate the change. For this to happen, there is something called Proof of Work which mainly bitcoin miners use. They compete to add the next block to the chain by solving cryptographic puzzles. The miner who completes the puzzle first gets the bitcoins stipulated for that particular cryptographic problem. However, the Proof of Work has serious flaws which cannot be tolerated in business transactions. It requires large amounts of computing power and energy to confirm or validate a transaction. This will never work in business and hence what is used in business blockchains is a secure ledger. In this type of ledger, instead of multiple users on a network, there is a secure host who is accountable and who is responsible for setting up a set of rules and regulations- a code of conduct for all the members on the network. This in our case can be the income tax department. The members can monitor the transactions and cry foul if the host is not following the rules laid out by it. The monitors follow the ledger and replay the inputs against the published code(Paul Frazee, 2017). Hence, accountability is provided by a very hard-to-forge public log. However, Blockchain is a very new technology and there could be many new algorithms which can come useful as substitutes for proof of work. However, the algorithmic intricacies are beyond the scope of this paper. All that can be said is that the secure ledger hosted by a trustworthy agency like the tax department of a company should suffice as an accountable and responsible entity for verification and validation of transactions.

Smart Contracts:

The term ‘Smart Contract’ can be best explained by an example. Let us take the example of a vending machine where in for a designated amount of money that is inserted in the machine, you will get a particular snack- maybe a bottle of water or soda or a packet of chips. The transaction is based on a simple agreement that by putting in some amount, you get a particular product. The same concept applies in buying tickets for a metro train from the automated ticket vending machine or maybe even buying goods from some unknown e-commerce site. These are very simple contracts but the important part here is that there is no need for an intermediary; that is the transaction happens directly between the machine and the customer. Smart contracts work on a similar principle. Nick Shabo created the term in 1994. Smart contracts are basically digital contracts. They are digital agreements in the form of computer programmes. Herein, the terms and conditions of the contract are inbuilt into the programme, and designed so

that they are automatically executed when the defined set of conditions are fulfilled. The main goal of these types of contracts is to remove the need of an intermediate body to regulate or execute the transactions(PricewaterhouseCoopers, 2017).

RESEARCH METHODOLOGY:

The main purpose of the research paper is to identify and address the core issues in GST implementation and compliance.

The research design is exploratory in nature and also has many descriptive elements. The primary data was collected through indepth unstructured interviews and discussions with businessmen, tax consultants and end consumers. This helped identify certain ground level issues which the researcher could not have known through secondary review of literature. Interviews and consultations with close to 30 businessmen and 2 consultants were carried out. Repeat meetings with few business houses were also conducted. The interviewees were selected based on non probability convenience sampling method.

ANALYSIS AND FINDINGS:

Implications for GST:

Indirect taxes are the biggest source of revenue for governments. In India, the monthly revenues from GST are close to rupees one lakh crores(Rs. 10 Billion)(Arora, Sharma, & Saluja, 2018).The authorities are always on the lookout for ways to make the tax regimen more effective and collection of taxes easier thereby reducing the budget gap. The rollout of GST was done with the same intention. But, as discussed earlier, the GST implementation and compliance is fraught with problems. The main reasons for the problems are that the transactions between parties are not recorded in real time but based on some arbitrary date like date of invoice or date of supply. Besides, the onus of tax calculation is left to the businesses. This is a big problem for SMEs in India. The other problem is that the system makes it difficult for governments to track GST payments leading to 'Missing Trader'and Carousel frauds. Infact, when VAT was introduced in the European Union, a Missing Trader fraud of €200 Million was perpetrated by tax evaders. In international context too, controlling GST data is a problem, because every country has its own tax norms and data management system.

The present GST System without Block chain:

Chart No. 1 explains how the different parties to goods and services are related to the government and how taxes reach the government after considering the unregistered businesses, the retailers making cash sales and the availing of Input Tax Credit by different tax payers. Let us assume that there are seven parties to the system i.e.

- Supplier
- Manufacturer
- Unregistered Entity
- Wholesaler
- Retailer
- Customer
- Government

Understanding the above mechanism,

1. The manufacturer purchases his supplies and raw materials from the supplier at the decided rate. The supplier issues purchase invoice to the manufacturer with all details required to generate GSTR1 by the recipient.
2. The manufacturer makes the payment to the supplier as per the stated amount in the invoice including the value of materials and the portion of GST.
3. The supplier, who receives GST on behalf of the government, performs his duty by forwarding that portion of GST as paid by the manufacturer to the Government.
4. The manufacturer sends the materials and unfinished goods to job workers to add value to them.
5. The unregistered businessesperform their tasks and return back the goods to the manufacturers in exchange of payment for their services. Most of them are unregistered and thus they do not come in light of the government as per the exemptions made by law. They neither receive taxes from the manufacturer nor remit such amounts to government, and thus the reverse charge falls on the manufacturer to pay taxes on behalf of the job workers to the government which they would claim a credit but at a later date, creating a short term financial burden on them.
6. Only after

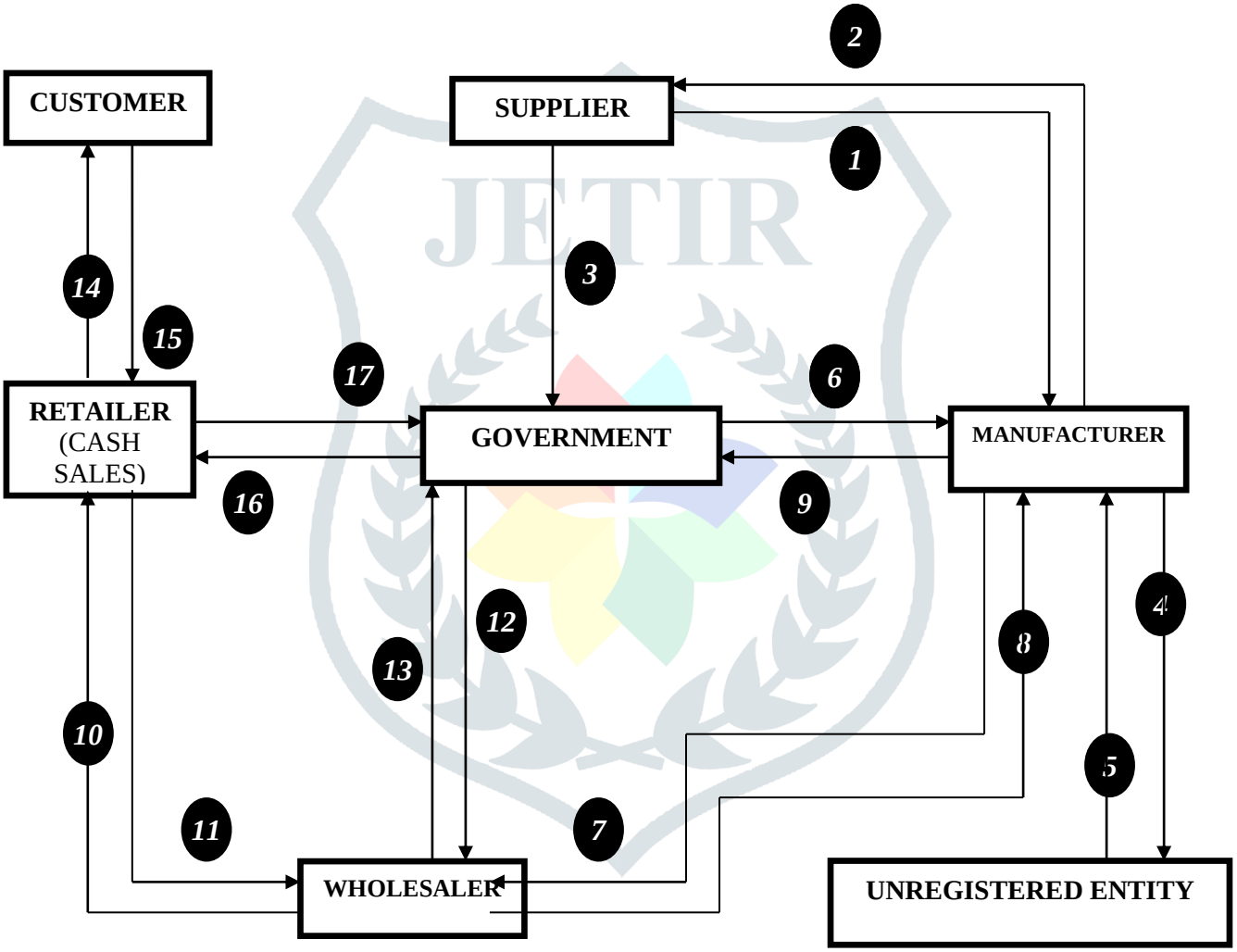
- the government has received tax from the suppliers
- the invoice matching on basis of details furnished by both the parties i.e. the manufacturer and the supplier

The government will grant ITC (Input Tax Credit) to the manufacturer. This may take time as ITC will not be granted until the above conditions are fulfilled so it becomes a burden on their working capital from both the ends. Also it may happen that this stage comes after the manufacturer has paid his tax liability if credit has not been given in his electronic credit ledger by the government.

7. Now the manufacturer sells goods to the wholesaler after adding his profit margin, he also gives the invoice to the wholesaler indicating all the details about the price of goods and the GST charges.
8. The wholesaler makes the respective payment to the manufacturer and obtains necessary documents to avail ITC.
9. Now, the manufacturer generates the GSTR3 describing his net tax liability to the government after considering ITC (of GST paid to Supplier as well as that paid on behalf of the unregistered entity). This net GST amount is now paid by manufacturer to the government.
10. The wholesaler sells the goods further to the retailer along with the sale invoice indicating required details, definitely after adding his profit margin.
11. The retailer makes payment to the wholesaler and gets documents necessary to avail ITC in future.

12. All the details are furnished to the government by the wholesaler to avail ITC in his electronic credit ledger maintained on the general portal.
13. Now the wholesaler pays his net tax liability to the government.
14. The retailer sells the goods and services to final consumer on cash basis exclusively and has a room for manipulating invoices while filing returns on the monthly basis for GST payments.
15. The customer pays the total amount including the Final price of the good and its levied GST charges which are clubbed as MRP, still some retailers, to fool the customers, charge GST over and above the MRP, in exchange of the receipt of sale which is sometimes not the valid GST invoice of the sale.
16. The retailer than receives the ITC from the government in his electronic credit ledger on the basis of the correct or manipulated information provided by them, during the filing of GST return.
17. The retailer pays his net tax liability to the government thus completing the whole process of GST payment to the government in parts by different parties.

Chart No. 1: Present GST system without Blockchain



The Problems with the current system:

1. Missing trader problem: Assume that trader A sold some goods to trader B. Trader A will issue an invoice with GST which Trader B will honour. Trader B will sell the value added goods to person C. Trader B has paid GST to trader A so now trader B will claim Input tax credit on that invoice as he has paid the GST to trader A. Trader B has collected GST from trader C. So now trader B will claim input tax credit from Income tax department for the tax that he has paid on behalf of trader A. This claim would be rejected because, trader A has mysteriously disappeared! Trader A has not paid the GST which was due from him, which he had received from trader B. This is called 'Missing Trader' phenomena, which is rampant in the current GST scenario.
2. The unregistered businesses, whose annual turnover is less than 20 lakhs, stay uncovered under the government's purview of tax payers. This leads to loss of government revenue by law and the burden on manufacturers of making tax payment on behalf of the unregistered workers through reverse charge mechanism. The tax authorities have no clarity as to on behalfof which unregistered entities is the registered entity making payment for which the government will have to give Input

TaxCredit. The laws regarding the claims are also ambiguous. In principle, the government does not encourage business with unregistered entities.

3. The Input Tax Credit will be disbursed only when the invoices and details furnished by different entities match and thus it takes time. This has a negative effect on the working capital of the tax payer. The government initially introduced both the forms but eventually had to withdraw the handling of GSTR2 by the purchaser as the technology infrastructure is currently unable to support simultaneous upload of both the forms. Originally, GSTR1 and GSTR2 had to be uploaded first and then GSTR3 had to be uploaded. But because of technical glitches resulting in a mismatch, the taxpayers now are allowed to upload GSTR3 first and that too individually. The removal of this mismatch is going to be a cumbersome task for the tax authorities and the taxpayers too.If there is some mistake in entering data or calculation of GST in case of composite goods, then in that case, there will be a mismatch in the GSTR1 and GSTR2. This can lead to unwanted confusion and delay in payment of input tax credit.
4. Clothing and footwear that cost below Rs. 500 are exempted from GST. But many shopkeepers, especially retail chains are still charging GST rate of 5% in their bills for such items. For garments which are above Rs. 1000, the rate of GST is 12%. Hence, the retailers show them as two garments and divide the price to fall into the Rs. 500 bracket so that the tax becomes 5% instead of 12%. For example, in a suit piece which has a Kurta, stole and bottom could be sold at 2 or even 3 garments to save GST. The fact that shopkeepers producing computerized bills and having an airconditioner in the shop are allowed to charge GST on all their goods encourages such practices.
5. Some retailers generally make cash sales not issuing a proper tax invoice, but only a receipt of sale to the consumers and thus have an option to make huge manipulations while filing GST returns to evade taxes.
6. Apart from all this, the general mentality of Indians wanting to evade tax gets in the way of effective implementation and positive acceptance of GST. Small unregistered traders and manufacturers have been able to find loopholes by which they can still fool the tax authorities.

Proposed GST System with Blockchain:

Chart No. 2

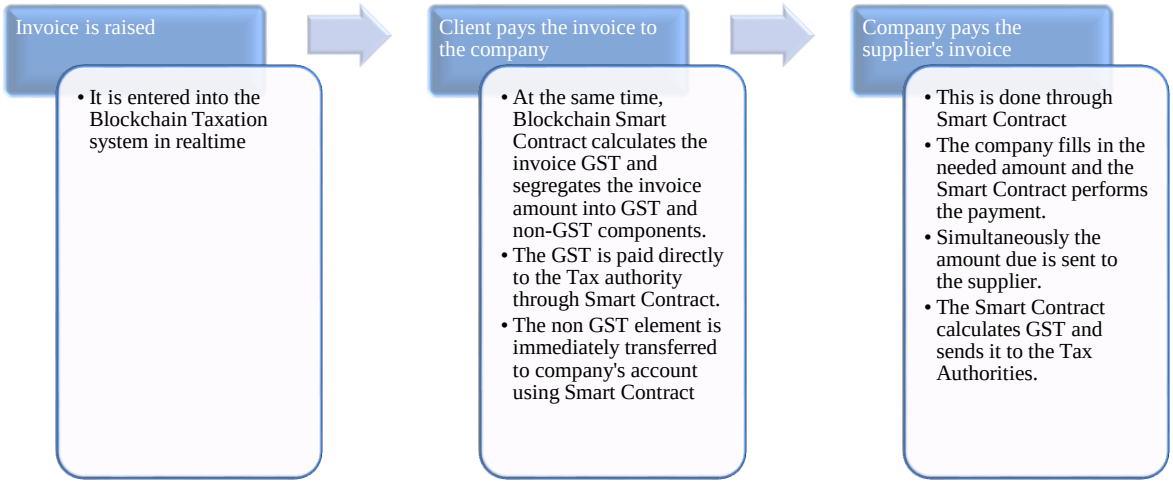
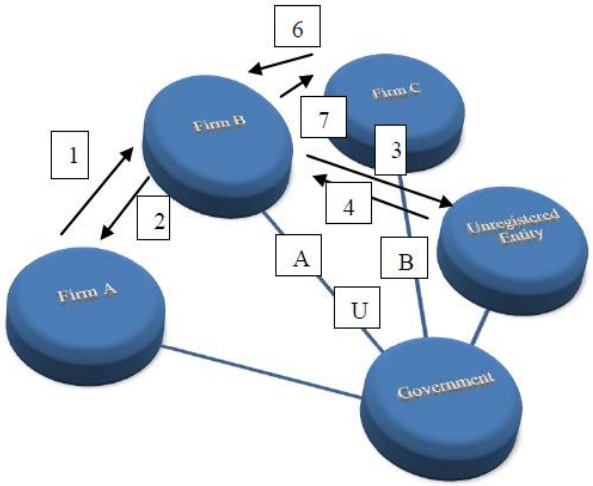


Chart No: 3 The Blockchain Arrangement:



The blockchain arrangement would be as depicted in the Chart no. 3:

1. When the first firm A raises an invoice on the firm B, a block is created which has the hash of firm A, B and also the transaction related information such as the invoice number, invoice amount, code of the product, name of the buyer (firm B), date of transaction etc.
2. Once the first block is created, the firm B accepts this record updated by firm A. All GST related calculations will be done by the system and GST and non GST amounts are calculated. The firm B makes the payment so that the system bifurcates this amount and credits the GST amount to the government (Transaction A) and the non GST amount to Firm A.
3. Firm B gets some value addition done through a non registered entity who returns the goods after the value addition(transaction 3, 4). He does not fall under the GST purview so does not charge GST. But firm B will pay GST on his behalf to the Government as reverse charge (Transaction U). The second block is created.
4. Firm B sells the value added product to firm C. B raises an invoice in the name of C. C accepts this invoice(transactions 6). A block is created when the information provided by both B and C tally. GST to be paid by C is calculated so that GST amount is credited to the government (transaction B) and remaining amount is credited to B (Transaction 7). This is the creation of the third block.
5. Firm A and Unregistered entity thus are both on the blockchain and all the information regarding their transactions would be available to the concerned parties on the blockchain.

The Blockchain Tax System- Answers to the problems of the current GST system:

1. It is very obvious from the above model, that the problem of 'Missing Trader' can be tackled with ease with this technology. In this system, the Trader B will not pay any GST amount to trader A, rather he will directly pay it to the Tax authorities.
2. All the businesses which are not liable to pay GST should also be registered entities on the blockchain. So, even if they are not required to charge GST, the transaction will still be a record on the system. The tax authorities would be in the loop as to the total amount of the invoices. They would also be aware whether the turnover limit of 20 lakhs for non registration is actually a truth. Multiple firms owned by the same promoters can also be dealt with in case the firms have been incorporated with the sole aim of evading GST.
3. The whole problem of Input tax credit can be done away with. The tax part is directly to be paid to the authorities at the time of bill payment. So there is no question of input tax credit and no problems of more or less tax payments. In this case, there might be an event of a certain class of consumers paying more GST than what they are liable to pay. Say for example, supplier A has sold a raw material to Entity B. The GST on raw material is 12 percent. The entity makes a product and sells it to customer say C. The rate of GST on entity B's product is say 5 percent. Now, in this case, supplier B has to actually pay 12 percent to Government but instead, entity A will give that to the government. C has to pay 5 percent but instead, B will pay it. In effect the government is getting whatever is the rightful amount of tax that it should get. In the current system, the government gives an input credit of the extra amount of tax which B has paid. Instead of that, if at the end of every month, the government gives a net consolidated statement to each registered entity and the amount of tax that each has paid. The credits if any will be settled real-time on a netted basis.
4. When every transaction is recorded on the blockchain with embedded codes, every good or service in the economy will be on record or rather most of the good and services will be on record. At the time of final sales if the retailer does not make an invoice, it will be very difficult for him to explain it. Either, the good should reflect in his inventory or in his invoice. If it is not found in either of the records, then at the time of inquiry, the authorities will definitely find out that it is a case of tax evasion. The whole concept revolves around tamperproof records of movement of goods and services in the economy.
5. As the system becomes transparent, consumers will trust the government more and will co-operate in making the whole system viable and compliance will increase.
6. Every entity will pay the tax directly to the tax authority and hence no question of refunds etc.
7. Reverse charges can be tracked with the type of goods/service/jobwork etc. since the unregistered entities will also be on the blockchain database.

For this system to work, certain initiatives will have to be taken from the side of the government and certain from the side of the taxpayers.

Role of Government:

1. Adequate Infrastructure: For a high end system like blockchain to work, the government will have to drastically enhance its infrastructure and GST network. At present, some of the issues are purely operational such as site overload, inability of the taxation departments to provide proper guidance or clarification with respect to the GST law and the procedures to be followed, inability of the current GST portal to handle as many transactions etc. If this has to be remedied, technology has to take a big leap.
2. Secure Ledger and Smart Contracts: The secured ledger system has to be in place and it is the government's responsibility to ensure that the sensitive data of taxpayers is on a secure platform and is never misused. A proper consensus system needs to be in place. Smart contract algorithms for payments, rules and regulations, GST calculations will be needed. Smart contracts can also be utilised to define the credit terms between sellers and buyers. Each buyer can define the credit terms with the seller and this can be embedded on the information contained on the blocks which are generated.
3. Digitisation of invoices: Digital invoices will play the most important role for the system to take off. These invoices will reduce paperwork and give a clear view of all the transactions taking place for all the entities involved, that too in real time.

4. GSTR2: At present, GSTR2 is not to be made by the purchaser even though that was how it was supposed to be. For the blockchain to function, it is very important that all the parties validate the transaction. If this is not done, then government will not accept that particular transaction. So it is important that GSTR2 be filled by the buyer.
5. Registration of all businesses on the blockchain network: One of the most important points is that even if an entity does not need to pay GST, it should still be registered as an exempted entity on the system. This will ensure that no one tries to evade taxes.
6. Reverse charges: The government needs to ensure that the reverse charges can be paid through input tax credit and not only cash.
7. Database of companies/businesses: The government GST portal should contain the data with respect to credibility, reputation, fraudulent transactions in the past etc. of all the companies and entities registered

Role of the tax payers:

1. Indian taxpayers need to learn to respect authority and understand that tax is not something that they are giving as charity to the government. It is basically a payment for all the things that you cannot make on your own. For example, when you go and buy biscuits from the market, you do it because it is cumbersome to make biscuits at home. Similarly, citizens cannot make roads, bridges, smart cities, public gardens etc. So in effect, we are paying for the services that we are availing and the government is working for us.
2. Qualified Staff: The businesses will now need qualified staff to make entries into the system. If the data entered is incorrect, then a consensus of all stakeholders will not be possible and transaction will fail.
3. Tech Savvy: The business entities especially the small and medium ones should become tech savvy and so can mitigate compliance challenges.

Proposed benefits of adopting the Blockchain technology:

1. The administrative burden of calculating GST on the part of companies will be drastically reduced. Lot of time and energy would be saved. Cost of accounting services will be reduced.
2. A huge repository of taxpayers' data will be collected which can be traced to all past transactions.
3. The transactions will be done in real time and a netting system will reduce the lag in filing of GST returns.
4. Since, it will be a peer to peer network, all parties to the transaction would be involved in the consensus/validation process.
5. Since the transactions will be powered and executed by smart contracts, they will be tamper proof and no one will be able to make any changes to them later.
6. The risk of frauds and mistakes will go down as the system will be very transparent but very secure.
7. One would be able to get immediate data about the fundamentals of the companies on the network with respect to their finances, delivery time, payment histories, product/service quality etc.
8. The speed of money transfers between taxpayers and government would become very fast. There will be no duplication of transactions- the government will be able to do away with tax credits and taxpayers would directly pay tax for the goods or services that they consumed rather than paying a tax for their supplier or seller and then taking input tax credit for any extra tax that they have paid on behalf of the seller of goods.
9. The central authority will be able to garner more trust from the taxpayers and compliance will increase.
10. The burden of tax calculation and managing and utilising input credits is done away with.
11. Frauds will be reduced to a large extent as the same system allowing the processing of GST from a transactional point of view will carry out multidimensional checks and verifications of the transactions.
12. The parties to the transaction can also be verified and so can the legal aspects of the transaction.

Concluding Remarks:

The Blockchain is a forward looking highly digitized system. Even in the Davos economic forum held in 2016, taxation systems as a use case of Block chain were discussed and analysed. Every government desires minimum leakages in their tax revenues. GST evasion or VAT evasion is common and for every law that the government makes and implements, there are people who will find a safe loophole to bypass the law. The GST law in India is a very strong document and has sound fundamentals backing it. The problem lies with implementation and efficient systems. Besides, the businesses in India make everything from soaps to space shuttles. Hence, the complexity of transactions and the number of small transactions is huge. The existing system is somewhat inefficient in handling the huge volumes and complex transactions of Indian businesses. The small and medium scale sectors do not have trained staff to upload information in the desired format and without mistakes. In such a scenario, the government should look at alternative record keeping and data management systems and blockchain in that sense is a powerful, secure and an extremely tamper proof transparent system. The secured electronic distributed ledger system and the smart contract assimilation make the system flexible and robust so as to incorporate any changes in the laws or rates of taxation. Individual contract algorithms can also be incorporated by firms based on their receivables and credit terms. Blockchain addresses most of the current issues befuddling the government and the taxpayers.

Brazil has the most advanced solutions as far as tax systems are concerned. Here, electronic invoices are mandatory and are received in real time by the tax authorities. India too has made digital invoices mandatory. That is a big step towards more advanced record keeping systems. Countries like Poland, Hungary and the European Union are making huge leaps with technology, incorporating real time reporting solutions. European Union is planning to launch a new EU-VAT system, based on the lines of digital secured ledgers and smart contracts("pl_Blockchain-technology-and-its-potential-in-taxes-2017-EN.pdf," n.d.-b).

Blockchain holds a lot of promise and governments all over the world are quite excited about implementing blockchain in the tax systems. The government will have to rope in data scientists and IT professionals to design a blockchain platform for GST. With the current government and its emphasis on digital India, Block chain seems to be the ideal solution for efficient tax collection.

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