

## Blockchain Technology: Challenges and Opportunities in the World of Indirect Taxes

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**Abstract:** Blockchain Technology revolutionize the market of digitization. Blockchain technology has also emerged as a solution in case of indirect taxes also. This technology can transform the tax regime and can contribute majorly to digital India. In GST a registered firm has to file 37 returns during a year, this technology will reduce this burden off the vendors as all the transactions are recorded in real time in block chain , which removes the need of filing any return. Transparency of system will remove all the loopholes from the system and tax evasion will also become impossible which will ultimately lead to reduction in frauds and a tampered proof system. Blockchain has brought a lot of excitement and this technology has shown its potential to transform business. But what this technology could do for the world of indirect tax? This paper will look at the challenges and opportunities that lies ahead for government in the world of indirect taxes.

**Keywords:** blockchain, indirect tax, digital, technology, GST

### 1. Introduction

With the constant evolvement of digital roadmap, IT technology is embedding itself in both business and everyday life. The way we communicate has been redefined by the invention of internet making it easier, faster and cost friendly. This same thing goes for technology also. Like forty years when someone was not at his/her home they were not connected as telephones were tied to a place. But now with advancements in technology, a mobile device not only help us in making calls or messaging but also does a lot of other things and even accompanies us wherever we go. In a very similar way the invention of the several disruptive technologies is pointing towards the weaknesses of several business models of most companies and national authorities have become accustomed to. However it is also true that not every technology in this era presents a very enthusiastic approach. A opinion from Buzz Aldrin states that the focus of our time has shifted from sending man on Mars to providing services (and he was not positive on these) such as increase in popularity of Facebook or Instagram in the current youth We may quote Dean Kamen on another opinion: "Every now and then, a new technology, an old issue and a big idea turn into an invention."

In the year 2008, a mysterious white paper which was written by a person or persons under the pseudonym Satoshi Nakamoto was welcomed by the world of the internet. This publication provided an description of the new digital currency which was based on data blocks that were cryptographically chained, built to rely solely on computer technology, disconnected from any intermediary. It was the Bitcoin age. For several years after that Bitcoin value kept on increasing at very high rates which lead to increase in its popularity. But what went unnoticed was the technology behind the success of this crypto currency. Today Blockchain has come a long way from being a technology behind cryptocurrency (Bitcoin) to a technology that could transform the way payments are made, data is stored and in performing several financial transactions.

This digital age of disruptive technologies is also forming the world of indirect taxes into an entirely different shape, by not only attempting to make changes in the relationship of taxpayers and tax authorities but also aiming to make several amendments in how the taxes are paid and how the information are stored. Instead, this potential of Blockchain technology has not gone unnoticed by a number of countries and new solutions are emerging, such as SAF-T in Europe or real-time electronic invoicing in South America, such as Brazil. Motivated by the need for greater transparency and improved enforcement, tax authorities have been attempting to digitally evaluate records, creating a safer atmosphere for a risk-free approach. In comparison, consumers do want the taxpaying process to become unchallenging and less time-consuming.

### 2. Literature Review:

At present GST in India is facing a lot of operational hurdles, even though at the launching time it was

regarded as the progressive reform. After the implementation of GST problems with respect to compliances were increased drastically as every registered business under the GST tax regime has to file a minimum of 37 returns every year and non-compliance will lead to reduction in input tax credit [1]. Businesses were not prepared for the infrastructure requirements with respect to GST as it required new IT Systems, proper tracking of their supply chains, etc. They were also not prepared about the adequate use of their working capital, cash flows and fund flows under this tax regime [2]. Skills required to effectively handle the compliances are currently lacking with both the government and industries. In the current GST tax regime various vendors have found out many loopholes for tax evasion. In the capital region, many shopkeepers make the invoice in name of one person and shift the burden of that invoice to another. This tax evasion technique involves the use of fake invoice and these fake receipts are issued to take the input tax credit in exchange of premium [3]. Another practical problem arising out of the current system is the mismatch between monthly returns of GST provided by the business houses. There are 3 returns to be provided by businesses monthly to the tax authorities. In GSTR-1 supply of goods is recorded. All the registered entities record their supply of goods/services whenever they raise an invoice in respect of such goods. GSTR-2 is for inward supply of goods. When goods are purchased from another vendor then those goods are recorded in GSTR-2. On a monthly basis every firm has to record their sales and purchases along with their tax liability to be paid to the government in GSTR-3. So, GSTR-3 records the transaction of both the returns but if comes a mismatch between any of the tax returns then business houses cannot take any input tax credit from the government which creates a problem for their working capital of the business. For this problem to be solved government needs to come out with a solution in order to make the things more easy and tampered proof for the small and medium businesses [4]. The businesses themselves have recognized that they too are influenced by digitalization. Many FinTech firms provide a digital approach for the multiple business processes. Companies now consider using blockchains as forward-looking technologies and as a possible future development mechanism. In the long run, businesses expect substantially lower prices, better efficiency, more precise, long-term monitoring and management systems [5]. The IT modeling of the taxation process has already been addressed and is common in the business and corporate sectors [6].

It can be inferred from the above problems that the solutions to these problems needs to technological based. In India there were lot of tax evaders which were taking the benefit of all the loopholes of previous system seamlessly so obviously GST was the perfect way to disrupt those evaders but the implementation needs to be seamless. This seamless implementation can only be achieved if there is proper backing up from the technology sector of India [7].

### **3. Blockchain Technology**

Blockchain became famous because of Bitcoin. However this technology has its implications go much beyond Bitcoin. Blockchain is a ledger of economic transactions that are programmed on peer to peer network to not just record financial transactions but everything that holds any value in monetary terms. But this technology not only records currency or money but also variety of data. Cryptography is used as a communication medium to provide security with information about all the involved parties. Everyone in the network knows if any peer is adding any type of information which provides transparency and correctness of the data. This data is added to a block and every block of this technology contains peculiar hash of the previous block. This hash and block technology connects the whole network to each other. There is also no possibility of altering any information on the block without altering the hash of that block [8].

#### **Characteristics of Blockchain**

1. ConsensusBased
2. Data locked withCryptography
3. Chronological
4. Time-Stamped
5. Digital
6. No need of centralizedregulator [9]

#### **Smart Contracts**

The best way to explore about smart contracts is through the example of vending machines. If someone tries to take some chips or soda out vending machine, one has to put some designated amount in the vending machine. This transaction between a person and vending machine holds a simple contract. This same contract rule applies to all the E-commerce sites also. This is a very simple transaction but the thing to notice is that transaction is fully automated and there is no need of intermediary. This is the same mechanism which is used in smart contracts also.

Nick Shabo invented the smart contracts in 1994. Smart contracts are referred to as digital agreements which are present in the form of computer programme. In smart contracts all the terms and conditions with respect to agreement are inbuilt and is programmed into contracts by the programmers. The main aim is provide fast and contactless transaction over the internet in a safe manner[10].

#### 4. Research Methodology

The study has been done taking into consideration various peer reviewed literature in the area of Indirect Taxes, Blockchain Technology and government measures with respect to its implementation. Most relevant research papers and articles were generated through the keywords of 'GST in India, 'Blockchain Technology', 'Smart Contracts', 'Tax Credits, 'Implication problems', 'Technology and its security', 'Industrial Revolution 'Papers were collected from online repositories including Scopus, Ebsco, the scholar of Google etc. Because the subject of question is an emerging field of technology, the data for this study was also gathered from various online repositories, whitepapers, articles and findings. Collected literature was then analyzed for relevance from perspective of the GST implications and its problem and how Blockchain technology in future can overcome such problems as stated above.

As described by Fink (2014)[23], "A literature review collects, and offers a history, overview, and critical assessment of such works in relation to the research question being studied, books, scientific Publications, and all other references related to a specific topic, field of study, or theory. Literature reviews are intended to offer a summary of the references you consulted when studying a single subject and to inform your readers how your work blends into a broader field of analysis. According to Carnwell and Daly (2001) [24] a comprehensive analysis of the literature will involve collecting knowledge from many outlets on the subject under discussion. The researcher will have a straight cut approach with regard to tee arch and knowledge collection.

According to Croninetal (2008)[25] a narrative or typical kind of literature analysis comprises of multiple research involving information of the topic under inquiry. This research is of a somewhat selective sort, because it finds studies important to the subject, which might not be clear to the readers at times. This approach is especially useful if the researcher wants to compile and synthesize a ton of knowledge related to a specific subject. Such an approach is often helpful in choosing a specific study issue with the goal of constructing a logical model or structure, when the researcher needs to refine.

#### 5. Findings of the Research

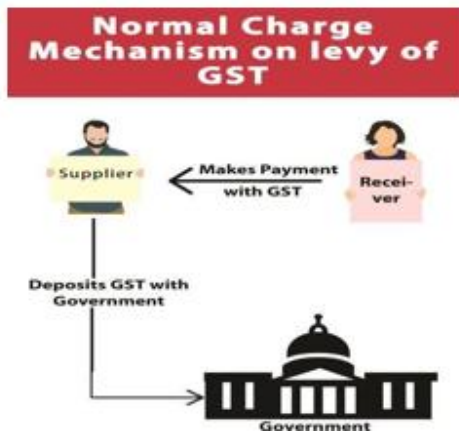
*GST Implication Problems:* At present, Indirect taxes are the biggest source of income for the governments. In India, GST collection in the fiscal year amounted to Rs.6.43 lakh crore (Economics Time of India). After the implementation of GST in India Governments of all the states and of central are always on the lookout to make the tax regime of the country more effective and collection of taxes more easy for both the government and the taxpayers which will ultimately lead to reduction in budget gap. This was the intention behind the rollout of GST in the year 2017 also. But, as defined earlier in the research that GST regime and its implementation in several countries have several problems.

One of the main problem behind its poor collection is that the transaction between two or more parties are not recorded in actual time rather it is recorded on the personal choice of assessee like date of invoice or on date of supply of goods [11, 12, 13].

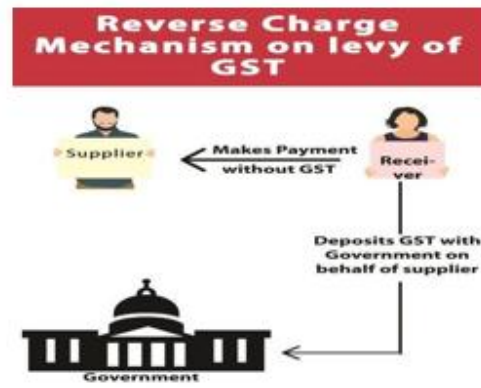
This may be inferred from the aforementioned example that the manufacturer of the products or services is entitled to pay GST. Nevertheless, under the reverse charge system, blame can be imposed on the receiver in particular situations such as shipments and other reported deliveries. Reverse Payment implies the duty to pay tax in respect of reported types of supply falls on the purchaser of the sale of products or services instead of the manufacturer of such goods or services. There are 2 types of reverse charge scenarios provided in GST law:

First is dependent on the nature of supply and/or nature of supplier.

Second Scenario is where taxable supplies by any unregistered supplier to a registered person.



**Figure-1** Normal charge of GST

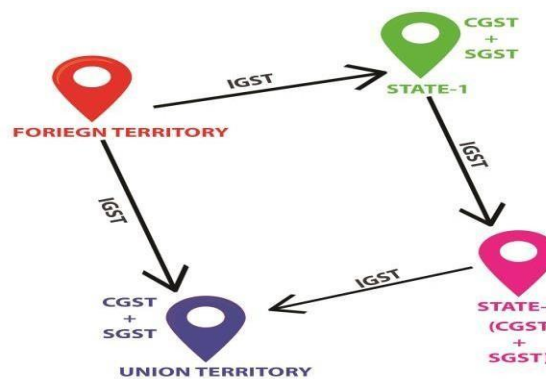


**Figure-2** Reverse charge of GST

Reverse charge mechanism ultimately falls on the manufacturer to pay taxes to the government on behalf of unregistered supplier on which they will claim credit simultaneously but at a later date creating a short term financial burden on them.

Under the GST tax structure, supply of goods and/or services is the taxable event in the eyes of tax authorities. Following different taxes under GST are levied on different supplies of goods and/or services:

- CGST is applicable on all intra-state supplies of goods and/or services.
- SGST is applicable on all intra state supplies of goods and/or services where the supply takes place within the same state/union territory with State legislature.
- UTGST is applicable on all intra-state supplies of goods and/or services where supply takes place within same union territory without state legislature.
- Integrated Goods and Services Tax (IGST) is applicable on all inter-state supplies of goods and/or services.



**Figure-3** Different types of GST

## 6. Input tax credit:

Every registered firm is allowed to have the benefit of input tax credit on supply of goods and/or services which are purchased with the sole aim of using the business and this amount is credited to electronic credit ledger.

Following conditions needs to be satisfied if a registered person wants to take the benefit of input tax credit:

(a) Registered firm or a person who holds the invoice of the goods or bill of entry or other similar documents. Under reverse charge recipient of goods will issue an invoice in the name of goods received by him from the supplier who is not registered under the tax regime.

(b) When a registered firm have received the goods. If the goods have been received by any agent or person acting on behalf of that firm than also it will be deemed to goods received by the firm. If the goods and/or services are received on installment basis than input tax credit to the firm will also be allowed to that firm on that

installment basis.

(c) GST in respect of these supplies needs to be actually paid to tax authorities but in case of reverse charge, this charge needs to be paid by the receiver of goods and/or services.

(d) Registered person has presented the GSTR-3B to the tax authorities on time.

(e) Even if registered firm has not made the payment to the supplier firm then also input tax credit shall be allowed to be deducted from the tax liability. But this registered firm needs to make the payment to the supplier firm within 180 days along with GST and interest and if this payment comes under reverse charge mechanism then it is not applicable. Interest to be paid is at the rate of 18% p.a. from the date of taking the credit till the date of making the payment. Even if the payment is made after 180 days then also payee can take the input tax credit.[14]

**Input Tax credit is granted by the government to the manufacturer. Here comes one of the major problems as government will only allow only if all the above conditions are satisfied which creates a burden on both ends of working capital.**

### Problems arising out of current GST System

1. Missing Trader Problem: Assume that business A sold goods to business B. For the goods sold Business A will issue an invoice to Business B which will be honored by Business B. On the goods bought from Business A, Business B will pay the amount of goods plus GST amount on those goods. After this transaction Business B is entitled to claim Input tax credit on the amount of GST paid to Business A. However when the goods are sold Business C from Business B and at the time of claiming of ITC, Government will reject this claim because of the mysterious disappearance of Business A. This will lead to loss of all the parties including the government as Business A has not paid the GST amount which the business had already received from Business B. This whole scenario is known as Missing trader phenomena which is currently getting out of control at this moment.[15]

2. Next Problem of GST arises out of unregistered businesses whose annual turnover amounts to Rs.20 lakh or less which gives them the option of voluntary registration. Many of these businesses opt to stay out of the registration as by opting out they will carry less burden but this thing increases the burden on government and on the other manufacturers. This leads to loss of revenue of the government and burden on manufacturers in the sense that they will have to pay the tax to the authorities on behalf of unregistered entities under reverse charge mechanism. Another problem which arises out of this scenario is lack of clarity among the tax collection department as they don't know on whose behalf payment is being made for which ultimately they will have to allow input tax credit to the traders. The law regarding this problem is also not clear. In reality also government also discourages transactions with unregistered businesses.

3. In case of many retailers they tend to make cash sales on which they do not issue a proper invoice with proper tax computation instead of this they just issue a receipt of sales to the consumers which gives them the option to make huge manipulations in their GST return for tax evasion.

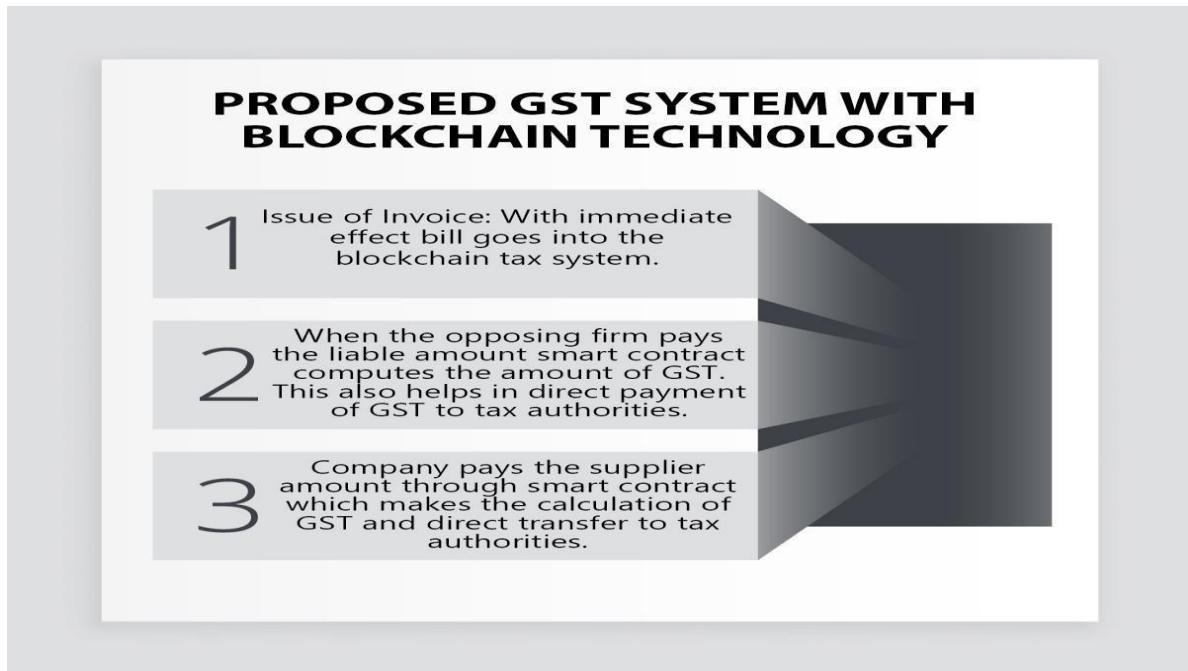
4. Next problem arises out of Input Tax Credit. Government only disburses input tax credit when the detail presented by different entities matches and this process takes time. This process has a negative effect on the working capital of businesses which are paying taxes to the government. In the initial days of GST government introduced both the forms but after some days they made the amendment and withdrew the use of GSTR2 by the purchaser because of lack of technology infrastructure. Technology currently present with the government doesn't support the simultaneous upload of both the returns (GSTR1 and GSTR2). As per the compliances of GST both GSTR1 and GSTR2 has to be uploaded first then GSTR3 and that too separately. This process leads to mismatch between the returns and the removal of this mismatch between is the biggest challenge in front of both government and tax payers at this moment of time. If there is wrong computation of GST or in making invoices which happens very frequently in case of bundled goods then it leads to mismatch in GSTR1 and GSTR2 which often creates great confusion and delay in payment of ITC.

5. Next problem is of Clothing and footwear sector. In case of clothing and footwear sector all the goods that cost below Rs.500 are exempted from the payment of GST. But despite this exemption provided by government to the assessee, small retailers still charge GST from their customers in their invoices. Apart from this the goods which cost more than Rs.1000 are liable for a GST of 12%. Tax evader in this case sells their goods as a separate item instead of selling them in a pair of Rs.500 each so that the tax rate becomes 5% instead of 12%. For Example in case of Kurta and Palazzo which is a pair and needs to be sold together instead retailers charge them as 2 items which ultimately leads to less GST. Shopkeepers with an air conditioner and computerized bill facility have the power to charge GST on all their goods which often encourages this practice.

6. Besides all these problems, there lies a problem in mentality of Indian taxpayers to evade taxes which leads to improper implementation and negative acceptance of GST. There have been many small traders and

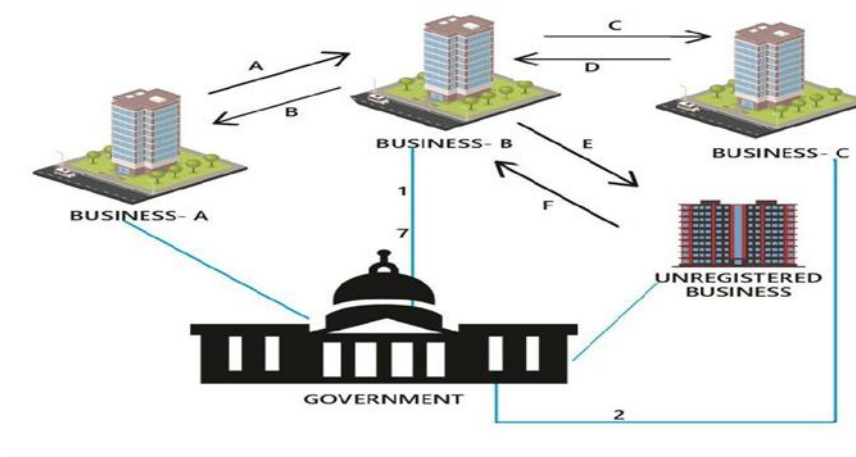
manufacturers who have found the loopholes in the present GST taxregime and continue to take full advantage of those loopholes until the government makes amendment in that context. [16]

**Proposed System of GST with Blockchain Technology to replace current system of GST in India:**



**Figure-4** Proposed GST System with Blockchain Technology

- When the Business A raises an invoice in the name of Business B, a block is created which will have hash of both the businesses A and B along with all the other information such as transaction date, product code, invoice number, invoice amount, name of the buyer (Business B)etc.
- After the creation of first block, Business B will have to accept this updated record by Business A. System will do all the GST related calculation and will also take into consideration non GST amount to the government. Business B then makes the payment so that the system divides this amount and gives the GST amount to the tax authorities and non GST amount to the Business A.
- Business B after getting the value addition gets back their goods from an unregistered entity. This unregistered retailer does not falls under the GST regime so he is not liable for any GST amount. But because of reverse charge mechanism Firm B will have to make the payment to tax authorities on behalf of the unregistered entity which will lead to creation of second block in the system.
- Business B will bring value to the product and will sell this product to Business C. Business B will issue an invoice in the name of Business C to make them liable for the payment. After accepting the invoice a block will be created on the basis of information provided by both the businesses. In this block GST will be calculated to be paid by Business C so that the GST amount gets credited in the tax authorities' account and non GST amount gets credited in Business B account. This whole process leads to creation of third block.
- Business A and the Unregistered firm are both on the system of Blockchain and all the concerned parties can get the information about them in any regard from the system.[8][17][18]



**Figure-5** Mechanism of GST System with Blockchain technology

What lies ahead with the Proposed Blockchain Tax System?

1. From the above illustration it can easily be concluded that the problem of Missing Trader can be easily solved. In the Blockchain technology Business B is liable to pay the GST amount to the tax authorities rather than to the Business A.
2. All the unregistered entities which come under reverse charge mechanism shall also be registered on Blockchain Tax System. So, when the need arises to pay the GST under reverse charge mechanism, the transaction of sale/purchase shall be recorded on the System with name and other details of both the parties involved. This process will also give another advantage to the tax authorities as they will become aware about the unregistered entity's turnover. (It is mandatory for a business to get itself registered if turnover exceeds the limit of Rs.20, 00,000). Owners of multiple firms will also come under the umbrella of Blockchain Tax System as many traders have many firms in their name or in the name of their relatives for the sole purpose of tax evasion.
3. Blockchain Tax System will also remove the problems with Input Tax Credit. In case of this system payment shall be made in full to the tax authorities only at the time of invoice payment so there is no question of more or less payment. In this case only one thing can happen which is payment of more GST by the consumers than they are actually liable for. For Example Business A has sold some goods to Business B at a GST of 12% and after providing value to the product Business B sold it to Business C but GST of B's product comes under the umbrella of 5% rate. Now Business B has to pay 12% GST to Business A whilst Business C has to pay 5% to Business B. In this case tax authorities are getting the rightful amount of tax from the assessee. In the current system tax authorities provide an input tax credit on extra amount paid by the Business B to Business A. This thing can be replaced by providing net consolidated statements to the registered firms under the tax regime by the tax authorities. This process will help in solving credit on a real-time basis.
4. Blockchain Tax System records every transaction on the system with embedded codes which makes the record of every good and service in the economy on the system. This process will make the explanation difficult for the Businesses if it is trying to sell an item without an invoice. He only has 2 options that the good shall either be in his stock or in his bill book. This will lead to a reduction in frauds with respect to movement in goods or services.
5. Transparency of the system will lead to an increase in trust among the customers about the government which will bring more co-operation from the customer side in making this system tamperproof.
6. In Blockchain Tax System the amount of refunds and the interest paid on them from the side will reduce as the payment of tax is made directly to the government.
7. Unregistered firms will also come on the radar of tax authorities as Blockchain tax system can track the reverse charge mechanism with the help of differentiation between goods and services.

[19]-[21]

### Role of Government

- Appropriate Infrastructure is required in order to make this Blockchain tax system to work properly which needs a major upgrade over the current scenario. Major issues faced by the present system are operational such as high traffic, government's inability to provide clarifications about GST law which often leads to ambiguity among

the public regarding different procedures.

- Government needs to take the responsibility regarding the secured ledgers as after the implementation of this technology all the sensitive information of every business will be there on the portal. It needs to be properly secured and never gets misused. Apart from Secure Ledgers, Smart contracts will also play a vital role as they will provide the algorithm for payments and all the calculations regarding GST. Credit terms between the buyers and sellers can also be defined on smart contracts which can be embedded on the blocks already generated.
- Government needs to make it mandatory for all the registered businesses to give all their customers digital invoices as it will not only reduce the paperwork but will also reduce the ambiguity of transactions in realtime.
- Government needs to make the amendment in their law regarding the payment of reverse charge through input tax credit also. At present, reverse charge can only be paid through cash.
- The government needs to create a proper database of all the entities of the country. (unregistered and registered both) Database needs to have their past record regarding their past transactions with government and whether government can trust their credibility in future.
- In the present scenario, assessee (purchaser side) is not filing the GSTR-2 even though GST law clearly states this return is supposed to be filed by him. For the Blockchain Tax System to work properly every party needs to give its consent for the transaction to make it a tampered proof transaction. [22]

### **Role of Businesses**

- To make this Blockchain Tax System successful all the businesses need to change their mentality with respect to our tax regime. Tax which we all are paying is not a charity but rather our duty for our nation.
- Businesses will need a well-trained staff to make correct entries in the system and they also need to be tech savvy to reduce the compliance challenges. [8]

### **Expected Benefits**

- Blockchain Technology will reduce the burden of computation of GST from all the parties which will save the time and office expenses of the businesses.
- Availability of huge database of the businesses. This database will help the government to get immediate data about the credibility of a business on the network with respect to their defaults, timely payments, products and service quality, financial stability.
- Involvement and validation of all the parties will be there since it is a peer-to-peer network.
- Smart contracts will reduce the security concerns and no business will be able to alter anything in their transaction.
- Transparency will bring down the risk of frauds and mistakes
- Trust among the taxpayers will increase towards the tax authorities which will also increase the compliance of GST tax regime. This will lead to a change in the mentality of taxpayers also.
- Blockchain Tax System will reduce the duplication which will ultimately lead to an increase in the speed of transactions. This will also help in the proper distribution of input tax credit as taxpayers only need to pay tax directly on their transactions instead of paying ITC of their suppliers also.

Legal Aspects of the business will also become easily verifiable after implementation of this system. There will not be any need to question the credibility of all the parties in case of a fraud. [14][23]. This allows them to validate that such requirements have been met in a contract, thereby triggering payment and the formation of the next step [24]. The younger generation – the one who has never used a chequebook – should lead the way, as should independent companies who aren't weighed down by expensive outdated programs. [6], [25][26]

### **7. Conclusion**

Blockchain is a promising technology and governments all over the world desire proper tax revenue from their people without any manipulation. Tax evasions are very common all over the world and government every year comes with a different law then also some people always find out the loopholes in the system. For this government have also made several amendments in the act in the middle of year also. Another Problem is the large population of India and every business is available in Indian market from making soaps to space shuttles,



there are a lot of small transactions happening in the real time. Current GST system is surely inefficient to tackle these problems of India as the businesses today require highly qualified staff to make entries of the transaction and to provide returns to the government on a timely basis. Blockchain Tax System provides a tampered proof plan to all these problems through smart contracts and secured ledger. This technology not only increases the transparency and security but also makes the whole process more flexible. Any amendment in the act at any point of time can be incorporated in the law. These changes can be anything like change in rate of taxes, changes in certain deductions, any change in negative list.

Currently Brazil has the best tax regime. They have made the digitization of invoices mandatory for all the registered vendors. Even India also has made this change in their system. India can link this transformation to its digital campaign as this technology holds a lot of promise and its implementation can result into huge transformation of the tax structure. For this Government will have to rope up several IT Professionals and data experts to make this platform for GST and with India always talking about reforming technology this can be the best step forward.

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