ISSN 2320 – 1371

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Quarterly Journal of the Bombay Chamber of Commerce and Industry Trust for Economic and Management Studies

Bombay Chamber of Commerce & Industry

The Bombay Chamber of Commerce and Industry is India's premier Chamber of Commerce and Industry situated in Mumbai, the industrial, financial and commercial capital of India. Established in 1836, it is one of the oldest Chambers in the country and has a long and illustrious history of continuous service to trade and industry.

The Chamber can boast not only of its longevity but also of its impeccable lineage. With more than 4000 prime companies as its members, the Chamber represents the cream of Indian Industry, Commerce and Services. While the name 'Bombay Chamber' conjures images of an organization representing exclusively a city-based membership, in reality it represents a wide spectrum of highly reputed and professionally run companies which are based in the city of Mumbai, but whose manufacturing facilities and commercial influence spread not only all over India but also internationally.

The Chamber uniquely represents large and medium sized Corporations, Banking and Financial Institutions, professional Consulting Companies and a large number of Multinationals. It comes as no surprise that today the Bombay Chamber's membership represents as much as a third of the country's GDP in the manufacturing and service sectors.

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From the Editor's Desk

The GoI has already announced that Goods and Services Tax(GST) is going to be implemented by July 1 and both federal and state government are working on this one. It is in this backdrop, mention may be made of the latest edition of the Global Competitiveness Index of the World Economic Forum which said the Goods and Services Tax, if implemented well, will be a 'game changer' for India. During 2016 Bombay Chamber conducted several events to update members on the Government's perspective on GST. In this issue we invited a research based study from an esteemed Professor of IIM Indore to share his thoughts on the same.

The said Global Competitiveness Index of the World Economic Forum also reveals the fact that - a large part of country not connected to the internet. This could be considered as one of the major weaknesses of India. The Chamber has conducted several events in recent past to educate members on the internet issues. In this issue, we have shared some more information on digital technologies with our members by publishing article on, Microsoft point of view on Blockchains.

During FY 2016-17 Chamber organized events, prepared and submitted representations and disseminated relevant information via print and social media to help the GoI to achieve an ambitious economic reform agenda by implementing strong and good governance in near future. In this issue we shared thoughts on the "Managing Fraud" governance too.

Your feedback and suggestions on this collection of articles would be highly appreciated.

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Printed at Uchitha Graphic Printers Pvt. Ltd.

Published and Printed by Vijay Srirangan, Bombay Chamber of Commerce & Industry Trust for Economic and Management Studies,
Admin. Office: The Ruby, 4th Floor N. W., 29, Senapati Bapat Marg, (Tulsi Pipe Road), Dadar (W), Mumbai 400 028 • Tel.: 61200200

GST and Its Implications for Business

*Dipayan Datta Chaudhuri**

Abstract

The paper has discussed the salient features of Goods and Services Tax (GST) and its implications for business. The rationale for implementation of GST in the context of drawbacks in the present system of indirect taxation is also outlined. The paper has analysed pros and cons of the proposed design of GST. The paper has concluded that successful implementation of GST would largely depend on the quality of tax administration at both the Central and the State level.

Introduction

The Union Finance Minister has announced that Goods and Services Tax (GST) will be implemented from July 1, 2017. Implementation of GST in a country like India with federal structure is fraught with many challenges. This will be a landmark reform in area of indirect taxation in India. It is envisaged that implementation of GST will simplify the structure of indirect taxation of our country. In this paper, I will discuss rationale for implementing GST, salient features of GST and analyse implications of GST for business and then few concluding observations will be drawn.

Why GST?

GST is basically a Value Added Tax (VAT). It would integrate several taxes on goods and services which are levied by the Central and State governments in India. The present system of indirect taxation is beset with lot of difficulties. For example, Cenvat paid on goods can not be claimed as set-off against State – VAT payable on subsequent sale of goods. This therefore, results in cascading effect in the economy. Over the years the distinction between goods and services is getting blurred as a result there are issues regarding overlapping of State – VAT and Service tax on SIM card for mobile phones, works contract, computer software etc. The existing tax – base is considered to be narrow as currently, the Central government can not tax beyond manufacturing and State governments are not allowed to levy taxes on services. Among BRICS countries, the Tax to GDP ratio is the lowest (i.e. 17.7 per cent) in India[1]. Under the present system, inter-State movement of goods attracts the Central Sales Tax (CST) levied by Centre

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and collected by the States. This is an origin-based tax and can not be given as set-off against State-VAT payable in the destination State. So, the current system of taxing inter-State transactions of goods causes cascading effect. Apart from CST, other taxes on the movement of goods such as Entry tax, Octroi duty etc. also hinder the free flow of trade throughout the country. At present, there are multiplicity of indirect taxes levied by both Central and State governments. The structure of indirect taxes in India is very complex and as a result the tax compliance is very low[2].It is expected that most of these issues will be resolved with the implementation of GST.

Salient Features of GST

The Empowered Committee of State Finance Ministers released the first draft of model GST Act and IGST Act in June, 2016. On the basis of various suggestions received , Model GST Law and Model IGST Law were released in November, 2016. Four bills – Central GST (CGST), Integrated GST (IGST), Compensation to States and Union Territory GST are cleared by both houses of the Parliament. The President of India has also given his assent to four bills paving the way for implementation of GST . We will discuss the salient features of the proposed design of GST primarily on the basis of information available in these documents.

(i) GST will be levied on ' supply ' of goods or services, or both ; except on supply of alcoholic liquor for human consumption. At present, indirect taxes are levied either on 'manufacture or production' of goods (i.e. Excise duty), on 'sale of goods' (i.e. State –VAT), on movement of goods (i.e. CST, Entry tax, Octroi duty) and on 'provider of services' (i.e. Service tax). In the case of GST the expression 'supply' includes sale, transfer, barter, exchange, licence, lease or disposal made or agreed to be made for a consideration by a person in the course or furtherance of business (Section 7, CGST Act.). It also includes import of services whether or not for a consideration and whether or not in the course of furtherance of business. The activities specified in Schedule I, made even without consideration will also be treated as supply. For example, gifts exceeding fifty Rs.50,000 in value in a financial year by an employer to an employee shall be treated as supply. In the Schedule II of the CGST Act. a set of activities are mentioned which may either be considered as supply of goods or as supply of services. The definition of 'supply' is very broad as it is given in the CGST Act.

(ii) 'Goods' are defined as every kind of movable property other than

money and securities. It also includes actionable claim [e.g. SIM card for mobile phones] and growing crops, grass etc. which can be detached from land before supply. 'Services' means anything other than goods, money and securities. The way 'Services' is defined it may also include immovable property. It is doubtful whether it is intended[3].

(iii) Every supplier shall be liable to be registered under this Act. in the State or Union territory from where he makes a taxable supply of goods or services or both, if his aggregate turnover exceeds Rs.20 lakhs (Rs.10 lakhs in the case of special category states) in a financial year. However, if the aggregate turnover in the preceding year did not exceed Rs.50 lakhs, then a registered person may opt for composition scheme. In that case, in lieu of the GST payable by him, he is required to pay an amount not exceeding 1 per cent of the turnover in State or in Union territory in case of a manufacturer or, 2½ per cent in State or in Union territory if he is engaged in providing composite supplies (e.g. works contract) or ½ per cent of the turnover in State or in Union territory in case of other supplies. However, tax payers making inter-State supply or paying tax on reverse charge basis shall not be eligible for composition scheme[4].

(iv) There will be dual GST – Central GST (CGST) and State GST (SGST) on intra-State supply of goods or services or both. The central government will now have additional power to levy GST on sale of goods and the state governments will have additional power to levy GST on manufacturing of goods and also on services. So, the tax base will now be broader and common for both central and state governments. Central Excise Duty (except on petroleum products), Service tax, Excise duty on Medical and Toilet preparations will be subsumed in CGST and State VAT, Entry tax, Octroi duty, Luxury tax, Tax on lotteries, betting and gambling will be subsumed in SGST. So, this would simplify the structure of indirect taxes in India. However, CGST can not be taken as input tax credit against the payment of SGST and vice versa.

(v) A tax called Integrated Goods and Services Tax (IGST) will be levied on all inter- State supplies of goods or services or both; except on the supply of alcoholic liquor for human consumption. The IGST rate is expected to be the sum of CGST and SGST. The credit of IGST will be permitted to be utilized for payment of IGST, CGST and SGST in that

order. The exporting or origin State will transfer to the Centre the credit of SGST used in the payment of IGST. The dealer in the importing or destination State will claim the credit of IGST while discharging his output tax liability in his own State. Centre will transfer the credit of IGST used in the payment of SGST to the importing or destination State. The transfer is essentially between the Centre and the State. Fund transfer from one State to another is not required. Since each State is importer as well as exporter, only the net sum needs to be transferred. A Central Clearing Agency will verify all claims and it will inform the respective governments to transfer the funds on monthly basis. Unlike CST, it will be possible to have seamless transfer of input tax credit in the chain of value addition till the final transaction of goods or services or both in the case of IGST[5]. So, IGST will replace CST which is not vatable. The revenue from CST is being collected and retained by the exporting or origin States. In the case of IGST, the tax revenue would accrue to the importing or destination States. This is likely to benefit poorer States since these States are generally net importer of goods and services. Countervailing duty (CVD) and special CVD will be at the rate equal to IGST. Input tax credit of this duty will be available. IGST will also be payable on stock transfers or branch transfers.

(vi) As per section 10(1) of IGST Act, the place of supply of goods within India (i.e. other than imports or exports of goods) shall be location of the goods at the time at which the movement of goods terminates for delivery to the recipient. Where the goods are delivered by the supplier to a recipient or any other person on the direction of a third person, then the place of supply of goods shall be the principal place of business of such person. Where the supply does not involve movement of goods, whether by the supplier or the recipient, the place of supply shall be the location of such goods at the time of the delivery to the recipient. Where the goods are assembled or installed at site, the place of supply shall be the place of such installation or assembly. Where the goods are supplied on board a conveyance, such as a vessel, an aircraft, a train or a motor vehicle, the place of supply shall be the location at which such goods are taken on board. It is very important to define the place of supply for goods, since GST is a tax on consumption and SGST rates are likely to vary from State to State.

(vii) The section 12 of IGST Act is on the place of supply of services where the location of supplier of services and the location of the recipient of services is in India. In general, the place of supply of services made to a registered person shall be the location of such person. In the case where the recipient is unregistered, the place of supply will be the location of the recipient when the address on record exists . If address of the recipient is not available then, location of supplier of services will be taken as a proxy for place of supply.

(viii) The liability to pay tax on goods or services shall arise at the time of supply. The time of supply of goods shall be the earlier of the following dates, namely:-

(a) the date of issue of invoice by the supplier or the last date on which he is required, under sub-section (1) of section 31, to issue the invoice with respect to the supply; or

(b) the date on which the supplier receives the payment with respect to the supply.

The time of supply of services shall be the earliest of the following dates, namely:-

(a) the date of issue of invoice by the supplier, if the invoice is issued within the period prescribed under sub-section (2) of section 31 or the date of receipt of payment, whichever is earlier; or

(b) the date of provision of service, if the invoice is not issued within the period prescribed under sub-section (2) of section 31 or the date of receipt of payment, whichever is earlier; or

(c) the date on which the recipient shows the receipt of services in his books of account, in a case where the provisions of clause (a) and (b) do not apply.

The date on which the supplier receives the payment shall be the date on which the payment is entered in his books of account or the date on which the payment is credited to his bank account, whichever is earlier.

(ix) The GST Council has announced four slab of rates for CGST. The rates are 5 per cent, 12 per cent, 18 per cent and 28 per cent. SGST rates will be decided by each State and these rates are likely to vary from State to State. With multiple rates of CGST and inter –State variation in SGST rates, the issues relating to classification of goods and

services would remain at least in foreseeable future.

(x) As per The Goods and Services Tax (Compensation to States) Bill, the Central government will compensate the States for any loss of revenue arising on account of implementation of GST for a period of five years. For this purpose, the Central government will levy GST Compensation Cess on demerit goods and luxury goods or services. A maximum 15 per cent cess on top of the peak rate of 28 per cent will be levied on luxury goods and aerated drinks. On pan masala, the cess has been capped at 135 per cent ad valorem. Tobacco cess will be capped at a mixture of Rs.4,170 per 1000 sticks or ad valorem of 290 per cent. Cess on coal would be Rs.400 per ton[6]. Such compensation for States would be for a maximum period of 5 years.

(xi) Implementation of IGST would require a robust settlement mechanism amongst the Centre and the States. This is possible when there is a strong IT infrastructure which enables exchange of information amongst various stakeholders. A Goods and Service Tax Network (GSTN) has been incorporated as a Section 8 company (non-profit) in order to provide IT infrastructure and services to the Central and State governments, taxpayers and other stakeholders for implementation of GST[7].

Implications of GST for Business

GST will be levied on 'supply' not on 'sale' so, it is likely that free promotional supplies made by companies (e.g. pharma) will now have tax implications. So far, a manufacturer with a turnover of Rs.55 lakhs is not required to pay Central Excise duty since the exemption limit is Rs.1.50 crore. In the GST regime, such a manufacturer will have to get registered and he is required to pay CGST and SGST since his turnover exceeds Rs.20 lakhs. In the case of GST, the value of supply of goods or services shall be on the basis of transaction value only. There is no provision for valuation on Maximum Retail Price (MRP) basis. As a result, manufacturers of such products such as retail, FMCG, consumer electronics, pharma etc. will now have to pay GST on the basis of transaction value instead of MRP. At present, manufacturers or traders can avoid paying State – VAT or CST whenever they are transferring goods to their own branches or depots located outside the State since such an act is not considered as 'sale'. But, in the system of GST, IGST will be levied on such an activity since it will be considered as 'supply'. So, it will not be economical for manufacturers or traders to maintain their branches or depots in different States. It is also observed that there is no separate provision with

respect to claiming input tax credit for capital goods. It seems that entire tax paid on procurement of capital goods may be claimed as input tax credit in the first year itself. This is likely to have favourable impact on overall investment scenario in the country. Since crude oil and natural gas are kept out of GST , companies like ONGC , OIL etc. will not be able to claim input tax credit for the GST paid on inputs for production of petroleum products[8]. This is likely to cause cascading effect throughout the supply chain. Petroleum products will however, be brought in the GST net later on the basis of the recommendation of the GST Council.

At present, service providers with a turnover more than Rs.10 lakhs are required to pay Service tax which is levied by the Central Government. In the case of GST, service providers with a turnover exceeding Rs.20 lakhs in general – category States (Rs.10 lakhs in special – category States) will be subjected to CGST and SGST. IGST will be levied on inter-State service providers.In this scenario, service providers would require to get registered with the commercial tax departments of the concerned State governments. Multi – State service providers such as telecommunication companies, banking and insurance companies need to obtain registration in almost every State. Although States are yet to release the SGST rates, it is likely that GST rates on services will be higher than the current rate of 15 per cent (i.e. 14 per cent plus 0.5 per cent Swachh Bharat Cess plus 0.5 per cent Krishi Kalyan Cess) which will result in an increase in the cost for consumption of services. This may cause inflation in the short-run. It has also been mentioned in the Schedule II of the CGST Act that composite supply like works contract shall be treated as supply of services. This is likely to simplify the procedure for taxing such composite supply.

In view of the rapid increase in e-commerce transactions, the CGST Act has stated that every e- commerce company shall collect tax at source (TCS) at the rate not exceeding 1 per cent of the net value of taxable supplies from the suppliers supplying goods or services through their portals. This TCS provision will help tax authorities to track transactions carried out through e-commerce platforms. This provision may however, cause an increase in the cost of e-commerce transactions.

It has been stated that there will be a floor rate with a small band of rates within which the states may fix the rates for SGST. So, the SGST rate for the same good or service may differ from State to State. Since IGST is the sum of CGST and SGST, the suppliers may not be indifferent between intra-State or inter –State procurement of goods or services. This is likely to cause trade diversion. I would like to highlight this issue with the help of a simple numerical example.

Let us consider two States – State 1 and State 2. Suppose, CGST rate on

a commodity X is 12 per cent. But the SGST rate on the same commodity is 10 per cent in the State 1 but 12 per cent in the State 2. A supplier from the State 1 has decided to sell the commodity X in his own State at the price Rs.15,000. But he has an option of procuring the product X at the price Rs.10,000 either from State 1 or from State 2.

If he decides to procure the commodity X from his own State i.e. State 1 then

	CGST	SGST
Tax payable on intra-State supply of goods	1800	1500
Tax payable on intra-State procurement of goods	1200	1000
Net GST payable	600	500

So, the total tax liability on the supplier is Rs.1100.

If he decides to procure the commodity X from State 2 then his GST liability

	CGST	SGST	IGST
Tax payable on intra-State supply of goods	1800	1500	
Tax payable on inter-State procurement of goods			2400*
Net GST payable	Nil	900	Nil

*IGST rate is 24 per cent (= CGST + SGST of State 2)

In this case, his tax liability is Rs.900.

In such a situation, it is beneficial for him to procure the commodity from the State 2 and instead of the State 1.

If we allow SGST rates to vary from State to State even within a narrow range, the objective of having single market throughout the country will not be fulfilled.

Conclusion

It is expected that GST would usher in a system of simplified tax structure as several existing indirect taxes would get merged with CGST or SGST. Tax to GDP ratio of India is likely to improve as the tax-base for both the Central and State governments would expand. The proposed design of GST will be favourable for overall investment scenario in the country since the credit of tax paid on capital goods is now permitted to be availed in one instalment. CST will be replaced by IGST as a result, there will not be any cascading effect in the case of inter-State transactions of goods or services. As I am writing this paper, classification of goods and services with respect to the four -tier CGST rates is not yet announced and SGST rates are also not known.

I have however, observed few disquieting features in the current design of GST. Cascading effect of taxation would remain since cross utilization of input tax credit between CGST and SGST is not allowed. The difference between any two CGST rates is quite large so, this may encourage suppliers to evade tax. It is unlikely that there will be a common market all over the country as IGST rate being a sum of CGST and SGST rates would vary from State to State. So, the current hype about achieving 'one tax, one market, one India' through implementation of GST would remain belied[9].

According to Bird and Gendron 'A defect anywhere in the administrative system can bring down the best – designed VAT'[10]. The success of GST will therefore, depend largely on how efficiently GST is administered as it

requires co-ordination between Central and State government tax officials. So far, central tax officials are not exposed to the nitty gritty of collecting taxes from traders or distributors and the state tax officials do not have any experience in dealing with manufacturers or service providers. The Comptroller and Auditor General (CAG) in its report has observed that faulty implementation of State-VAT has resulted in widespread tax evasion in many States[11]. In my opinion, GST would resolve some of the difficulties of the current indirect tax system but, it would also give birth to new issues which would require immediate attention from the tax authorities. The success or failure of GST would largely depend on the quality of tax administration. It is said that 'the proof of pudding is in the eating', so let us look forward to this 'pudding' which is expected to be ready on July 1, 2017 with Bon Appetit!

Notes

1. Tax – GDP ratios for Brazil, Russia, China and South Africa are 34.4 per cent, 19.5 per cent, 28.1 per cent and 26.9 per cent respectively.
2. CGST Act. 2017
3. All About GST by V.S.Datey , Taxmann, 5th edition, 2017.
4. 'Reverse charge' means the liability to pay tax by the recipient of supply of goods or services or both instead of the supplier of such goods or services or both. This practice of taxation is generally followed in the case of import of goods or services.
5. Frequently Asked Question (FAQ) on GST, Central Board of Excise and Customs , 2017.
6. Economic Times March 16, 2017
7. http://www.gstn.org/about-us/
8. Business Line March 20, 2017
9. Business Standard February 25, 2017.
10. The VAT in Developing and Transitional Countries by R.M.Bird and P-P. Gendron , Chapter 9. Cambridge, 2007.
11. Implementation of Value Added Tax in India – Lessons for Transition to Goods and Services Tax – A Study Report, Comptroller and Auditor General of India , New Delhi, June 2010.

Envisioning a World of Distributed Ledgers

Microsoft Point of View on Blockchains

*Vishwas B S Rao**

Preamble

January 2009 is a turning point in the history of 'Digital technologies'. Bitcoin network came into existence with the release of the first open source Bitcoin client and issuance of the first Bitcoins with Satoshi Nakamoto mining the first block of bitcoins ever. The technology that powers bitcoins is 'Blockchain' that is distributed, shared, open and secure ledger.

Blockchain enables a digital world where contracts are embedded in code and are stored in shared databases, protected from manipulation and revision. Every interaction in the entire process be it a smart contract, a process, a task, a payment, a modification to the contract, are all digitally recorded with signatures that could be validated, stored and shared. Blockchain can obviate intermediaries like lawyers, brokers, and bankers. Individuals, organizations, machines, and algorithms would freely transact and interact with one another with little friction.

Harvard Business Review in its article 'The Truth About Blockchain' says, "Blockchain is not a disruptive technology, which can attack a traditional business model with a lower-cost solution and overtake incumbent firms quickly. Blockchain is a foundational technology: It has the potential to create new foundations for our economic and social systems. But while the impact will be enormous, it will take decades for blockchain to seep into our economic and social infrastructure. The process of adoption will be gradual and steady, not sudden, as waves of technological and institutional change gain momentum."

Nevertheless, the past eight years have seen significant adoption of blockchain technology across domains. The inherent nature of blockchain that makes it secure, scalable means that it will be the preferred mode soon, particularly in the Banking and Financial Services industry.

Being a foundational technology, Blockchain has immense applications across domains. Substantial work is being carried out in Manufacturing and Supply chain, Services like travel and reservations, etc.

One of the most important utility of the

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Blockchain would be in Government, where the implicit nature of Blockchain will ensure efficient service delivery. Education sector might see quicker adoption of Blockchains owing to the verifiability of data.

This article attempts to demystify Blockchain as a technology and identifies some of the functions and activities across domains, that could see rapid adoption of Blockchain, through which organizations can transform the industry.

Introduction to Blockchain

"Imagine a technology that could preserve our freedom to choose for ourselves and our families, to express these choices in the world, and to control our own destiny, no matter where we lived or were born. What new tools and new jobs could we create with those capabilities? What new business and services? How should we think about the opportunities? The answers were right in front of us, compliments of Satoshi Nakamoto."

When we consider the blockchain conundrum the quote by Don Tapscott in his renowned account titled 'Blockchain Revolution', does not seem to be exaggerating the utilities of blockchain as a technology, across disciplines from banking to capital markets; from manufacturing to retailing; from government to governance.

[1]World Economic Forum in August 2016 says Distributed Ledger Technology has captured the imaginations and wallets of the financial services ecosystem. Some of the statistics that are quoted include:

HBR defines Blockchain as *"an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. The ledger itself can also be programmed to trigger transactions automatically."*[2]

Blockchain as a Distributed Ledger has four distinct advantages,

Security – Uses cryptography to create transactions that are impervious to fraud and establishes a shared truth.

Shared – Blockchain value is directly linked to the number of

organizations or companies that participate in them. There is huge value to even the fiercest of competitors to participate with each other in these shared database implementations.

1. http://www3.weforum.org/docs/WEF_The_future_of_financial_infrastructure.pdf
2. Marco Iansiti and Karim Lakhani, "The truth about blockchain" Harvard Business Review, January 2017

Eliminates Intermediaries
Allows industries to redefine or create new business models.

Reduces Fraud
Highly secure and transparent, making it nearly impossible to change historical records.

Increases Efficiency and Speed
Simplifies transactions and enables T+Zero settlement time.

Increases Revenue and Savings
Potential savings and new revenue opportunities through more efficient processes and reduced costs.

Ledger – The database is "write once" so it is an immutable record of every transaction that occurs.

Distributed – There are many replicas of the blockchain database. In fact, the more replicas there are the more authentic it becomes.

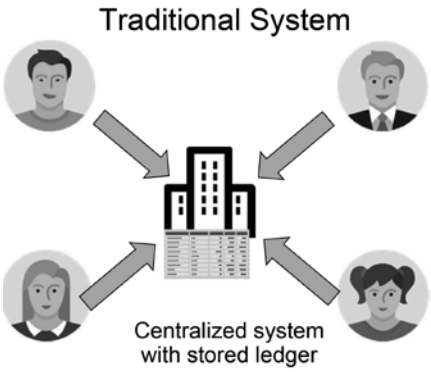
Blockchain can bring greater transparency, security, and efficiency in our current business processes eliminating inefficiencies. It can enable new business models based on distributed marketplaces and technology

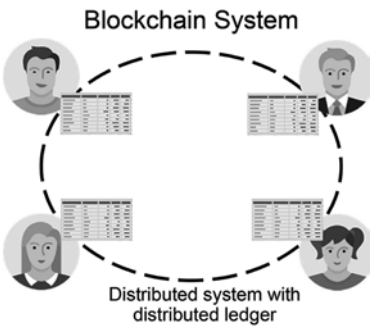
Bitcoin was the first application of Blockchain technology. It is a cryptocurrency invented by Satoshi Nakamoto. It is a peer-to-peer system where transactions are done between the users directly without any intermediary like a Bank or a network like SWIFT. The transactions are verified within the network and recorded in a Blockchain.

Traditional Systems vs Blockchain

Traditional Systems

Traditional systems that are being used are centralized and use intermediaries like Banks and/ or middlemen to approve and record transactions. The centralized database at the Bank / intermediary's premises will be the single source of truth for all transactions.





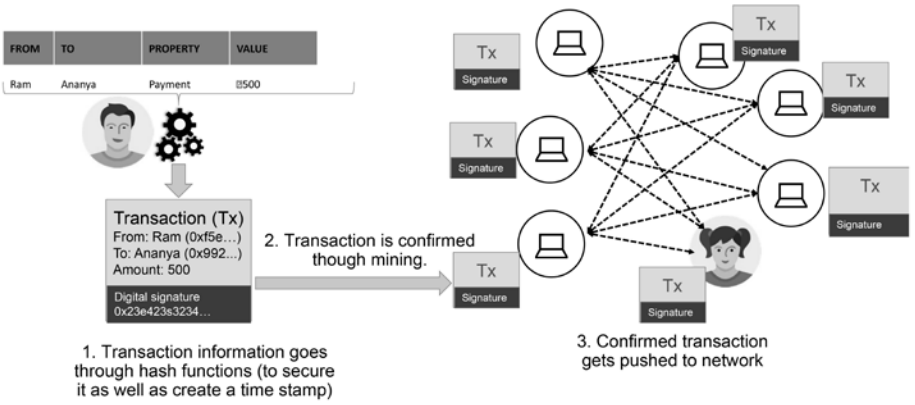
Blockchain System

Blockchain safely distributes ledgers across the entire network and does not require any middleman. The technology maintains multiple replicas like p2p torrent file sharing.

How does a Blockchain work?

An ingenuous representation of the Blockchain in action is depicted below.

Block is formed with one or more data elements or transactions with their *hashes and Merkle Tree*. Block header

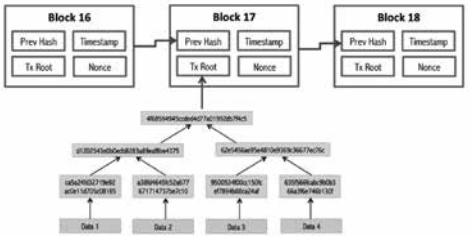


additionally has with the hash of the header of the previous block, forming a chain, the **Blockchain**. This chains the blocks together and transactions cannot be modified without modifying the block that records it and all the following blocks. Transactions are also chained together as shown below.

The first block in the blockchain is called as the Genesis block. Each subsequent block is addressed by its block height, which represents the number of blocks it is away from the genesis block.

Mining is the process to create blocks and add blocks to the entire blockchain. To prove that she did some extra work to create a block, a miner must create a hash of the block header, which does not exceed a certain value.

Irrespective of the exact mining process that updates the blockchain ledger, it is imperative to ensure that the ledger is universally accepted across the network at any given point of time. This warrants for a consensus scheme in the protocol. This decentralized consensus mechanism ensures a consistent version of the blockchain ledger amongst all members of the network, and provides the most important tamper-detection and tamper-resilience property to the blockchain.



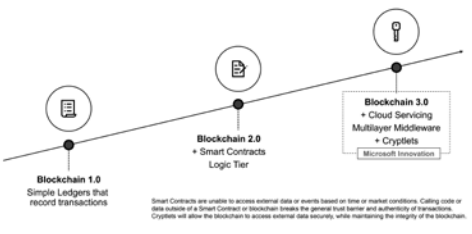
A Blockchain like Bitcoin is a Public Blockchain.

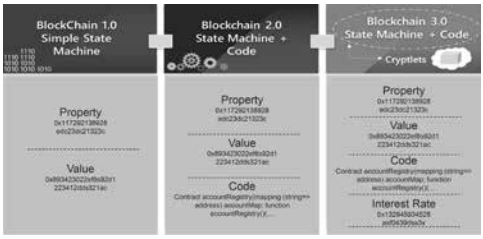
Evolution of Blockchains

Blockchain has evolved from the initial implementation in Bitcoin. Smart Contracts leverage the power of Blockchains features by enabling you to create Smart Contracts

Smart Contracts

Smart Contracts that have all the aspects of traditional contracts – Formation of a contract generally requires an offer, acceptance,





consideration, agreement. Smart contracts enable the users to build programmable logic into contracts, the terms and conditions of the contract, so that actions can be triggered such as approvals or events like a share price hitting a certain value. Since the programs cannot be changed, it not only builds the trust between the parties but also enables the audit and compliance processes legally.

Smart contracts will evolve in the future to integrate with Smart Assets. In this scenario, a smart contract could be triggered to execute a payment when a physical asset is delivered to a location – an example could be that a user orders a car, and the payment is processed only on delivery to her house.

Organizations like Microsoft are building unique technology in this space to allow users to link the Blockchain solution to their existing technology investments. An example of this would be to integrate a Blockchain with the companies Directory and employees Digital Identity.

What does it take to adopt a Blockchain?

Some of the challenges that are involved in adoption of Blockchain include:

- Standardization – One of the key advantages the Internet had vis-à-vis Blockchain was standardization driven by non-commercial entities.
- Technology decisions – Public vs Private Blockchains; Cloud vs On-premise
- Integration with the legacy systems
- Onboarding the ecosystem
- Application Development
- Security requirements
- Awareness to end users
- Cross Blockchain interoperability

Nonetheless, the technology will mature over a period of time and will be widely used.

Next sections address the uses of Blockchain with real life scenarios.

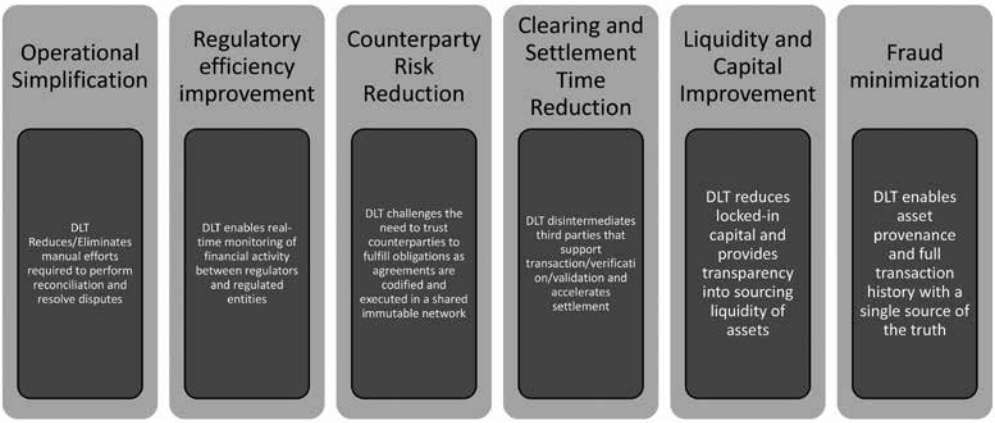
Blockchains in Financial Services

The Future of Financial Infrastructure – August 2016, World Economic Forum enumerates the benefits of blockchain as follows.

Institute for Development and Research in Banking Technology (IDRBT) has released a whitepaper[3] on Application of Blockchain technology to Banking and Financial sector in India. This whitepaper discusses details on some of the business applications that could start using Blockchain.

Some of these applications include:

[3] http://www.idrbt.ac.in/assets/publications/Best%20Practices/BCT.pdf

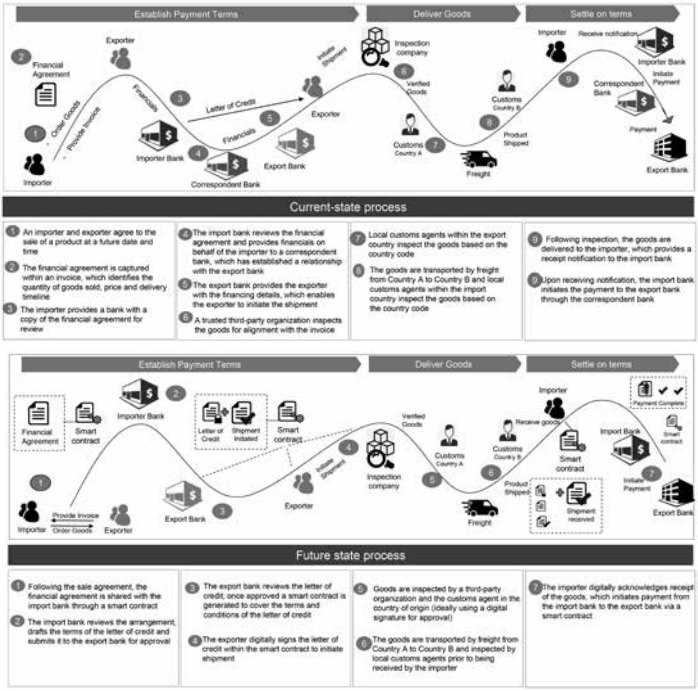


Digital Currency / Cryptocurrency

A cryptocurrency is a form of digital currency designed to work as a medium of exchange using cryptography to secure the transactions and to control the creation of additional units of the currency. Examples include Bitcoin, Ethereum, Ripple, Dogecoin, etc. As discussed earlier, Bitcoin was the first implementation of Blockchain technology.

Applications without Native currency

Trade Finance is the domain that is most frequently suggested for adoption of Blockchain. Entire processes of Bank Guarantees, Letters of Credit, Bills, Discounting, Forward Contracts etc. could be put on the Blockchain and the results would be visible quickly.



A typical cycle for issuance of Letter of Credit all the way to payment settlement will take at least a few weeks with multiple entities involved and a considerable movement of physical papers across the stakeholders. When the same process is adopted digitally using a Blockchain, it has a profound impact in terms of reduction of timelines for processing as well as near-zero movement of physical paper across.

The current process being followed vis-à-vis the future state process has been depicted below.

Know Your Customer

Every Bank and Financial Institution performs a Know Your Customer process individually based on the nature of business that the customer does with the Bank. A customer having multiple accounts and relationships like Mutual Funds, etc. will have to provide the same documents to multiple entities, without which some of the transactions will be blocked by the Financial institution.

A Blockchain based registry that would be shared between the networked entities can help them overcome this challenge and reduce efforts of duplication. Any update to a customer data shall be updated in the entire Blockchain ledger in near real-time, by one of the networked institutions. This information could be reused by all the institutions on the Blockchain network. The other significant advantage of the KYC Blockchain is that all the historical records of all documents that have been shared and compliance activities undertaken for each customer will be recorded and is immutable.

Other Areas in Financial Services

Some of the other areas in Financial Services where Blockchain could be used include:

- Trading
- Deal origination
- POs for new securities
- Equities
- Fixed income
- Derivatives trading
- Commodities trading
- Total Return Swaps (TRS)
- 2nd generation derivatives
- The race to a zero-middle office
- Collateral management
- Settlements
- Payments
- Transferring of value
- Anti-money laundering
- Crowd Funding
- Peer-to-peer lending
- Compliance reporting
- Trade reporting & risk visualizations
- Betting & prediction markets

Blockchain Work happening in Financial Services in India

IDRBT has done a Proof of Concept for some of the scenarios. Some of the Banks and NBFCs are in the process of initiated or have already initiated

proofs of concepts for specific business scenarios using Blockchain technology. Some of the recent developments include:

- Yes Bank Builds Blockchain for Vendor Financing. Built for consumer electrical equipment manufacturer Bajaj Electricals, with help from start-up Cateina Technologies, the permissioned blockchain system digitizes how Bajaj Electricals is able to transact with its clients.[4]
- Emirates NBD, ICICI Complete Cross-Border Blockchain Transaction. [5]
- Axis Bank and Kotak Mahindra Bank are working on early concepts related to cross-border payments and transaction settlement. [6]
- Axis Bank to launch Ripple Payments[7]
- India's biggest stock exchange and a group of domestic banks recently collaborated on a know-your-customer data trial involving blockchain. The test involved the National Stock Exchange of India (NSE), ICICI Bank, IDFC Bank, Kotak Mahindra Bank, IndusInd Bank and RBL Bank, as well as HDFC Securities, a Mumbai-based brokerage. Blockchain start up Elemential provided the technology for the trial.[8]
- Bank-Chain: India's first Blockchain exploration consortium launched for banks. State Bank of India (SBI) has taken the initiative to take this effort forward as it believes that it is essential for banks to collaborate and develop Blockchain solutions for the betterment of the financial sector. Axis Bank, Central Bank of India, DCB Bank, Deutsche Bank, HDFC Bank, ICICI Bank, IDBI, Kotak Mahindra Bank and Saraswat Bank have also shown an interest in collaborating for Bank-Chain.[9]

Insurance Industry

Insurance industry in India is undergoing paradigm transformation propelled by the digital wave that is taking shape in India. The following could be the use cases for using Blockchain Technologies in Insurance.

- Customer on boarding
- Transparency – Pay outs for flight insurance are initiated when cancellations or delays are reported from verified flight data sources, so that customers can be assured that the insurer won't hold up their pay-outs
- Automation – Peer-to-peer supplemental unemployment insurance using social network profile data to verify employment status, Bitcoin-powered smart contracts automate claims and underwriting, combined with verifications from other policyholders.

4 http://www.coindesk.com/indias-yes-bank-builds-blockchain-vendor-financing/
5 http://www.coindesk.com/emirates-icici-complete-cross-border-blockchain-transaction/
6 http://www.coindesk.com/bank-trials-india-blockchain-interest/
7 http://www.coindesk.com/indias-axis-bank-launches-ripple-payments/
8 http://www.coindesk.com/india-stock-exchange-blockchain-kyc/
9 http://computer.expressbpd.com/news/bank-chain-indias-first-blockchain-exploration-consortium-launched-for-banks/20453/

- Fraud Detection - Label products and store the history and supply chain in the blockchain, allowing users to check for counterfeit products, diverted or stolen goods, or fraudulent transactions
- Micro Insurance – Blockchains with smart contracts could be applied to micro-insurances "to offer them at low handling costs, if underwriting and claims handling can be automated based on defined rules and the availability of reliable data sources
- IoT – Electronic devices or home appliances can have their own insurance policies registered and administered by smart contracts in a blockchain network, automatically detecting damage first and then triggering the repair process, as well as claims and payments

Government and Education

Government and public services have some of the more complex processes, could be defined as centralized yet not so-centralized. In a large country like India, this conflict of Centralized – Decentralized governance and service deliveries build inherent inefficiencies in the system.

Blockchains could be used to address some of these inefficiencies in the current systems to increase effectiveness of service delivery and governance. Government could enable use of Blockchain for the following categories of activities:

1. Verification
2. Movement of assets
3. Ownerships
4. Identities

Instances where blockchain could be used are as follows:

- Tendering process - End to end tendering process including submission of documents, evaluation of tenders, signing smart contracts and all the way till payments to the vendors could be brought on to a blockchain. This process brings transparency to the entire process and will enable foolproofness of the system as there will be no scope for malpractices.
- Asset Registry – The Government could use Blockchain based Asset Registry for Government licensed assets and Intellectual Property owned by businesses and individuals. Government of Andhra Pradesh has introduced Blockchain based solutions on a pilot basis for Civil Supplies and Land Registration departments[10].
- Corporate Affairs records can be put on a blockchain for registering new companies, tracking share movements and managing shareholders' communications
- Sweden is planning to place real estate transactions on the blockchain so that the stakeholders will be able to track the progress of the agreement once its completed. This will enable instantaneous confirmation of all the transactions in the chain.[11]
- Estonia has established an

[10] http://indianexpress.com/article/india/andhra-pradesh-blockchain-technology-cyber-crime-chandrababu-naidu-4434206/

e-residency program using blockchain. The program offers anyone, anywhere, a digital identity issued by the Estonian government and the possibility to start and operate a business online under Estonian regulations. The foreigners who become e-residents of Estonia are not automatically entitled to physical residency in the small Baltic state, but they can base their online financial life there.[12]

- E-Voting is another area that could be explored

As education becomes more diversified, democratized, decentralized and disintermediated, we still need to maintain reputation, trust in certification, and proof of learning. The increased focus on relevance and employability may also push us in this direction, as we also need more transparency. Blockchain could provide just such a system: a massive open, online, secure database[13]. Institutions could issue certificates on the blockchain. Encryption and multi-factor authentication could be used to signoff and store the certificates on the blockchain. This could be extended to certification authorities like PMI, GMAC, TOGAF, IELTS, etc.

Manufacturing and Supply Chain

Manufacturing and Supply chain are seeing a quick adoption of Blockchain for some of the processes.

Organizations are innovating with use of Blockchain across the supply chain – From diamonds to Oil & Gas; From component manufacture to delivering finished goods.

Significant work is happening in the Diamond industry for tracing path of diamonds from mines to customers including the entire process chain involved like cutting, polishing, etc.

Oil and Gas organizations are using Blockchains for upstream operations, particularly around explorations that use blockchain to record movements of wellbore rock and fluid samples and better secure the real-time data that is generated during delivery. This solution that has been developed for BHP Billiton allows both the company itself and the vendors they use throughout the supply chain, to track live data of material movements.[14]

Another innovative case study of using Blockchains has been in the travel industry. webjet.com.au is a leading online travel agency in Australia and New Zealand, providing end to end travel solutions to their clientele. Webjet handles thousands of hotel bookings every day that pass through multiple operators. The high volume of transactions and number of parties involved in each transaction can lead to discrepancies. Booking errors negatively affect customers' experiences and undermine trust between Webjet and its partners and can also have serious financial consequences. Blockchain based 'Smart Contracts' was introduced that streamline the process of booking and payment processes reducing the errors, boosting security & efficiency. [15]

[11] http://www.coindesk.com/blockchain-perfect-government-services-heres-blueprint/

[12] https://bitcoinmagazine.com/articles/estonian-government-partners-with-bitnation-to-offer-blockchain-notarization-services-to-e-residents-1448915243/

[13] https://oeb-insights.com/10-ways-blockchain-could-be-used-in-education/

[14] http://www.afr.com/technology/from-bhp-billiton-to-nasdaq-blockchain-is-booming-20161018-gs5c11

[15] http://www.afr.com/technology/webjet-moves-early-with-microsoft-to-create-first-blockchain-for-hotel-bookings-20161104-gshwra

"Internet of Things" and Blockchains can be a potent combination for the sector, supporting an economy based on Machine-to-Machine (M2M) communication. Connected and Smart appliances, Connected Vehicles and Supply Chain Sensors that can provide secure data for further analytics. Experiments are being carried out for real-life use cases for instance a washing machine can order for detergents when it runs out and will be able to negotiate for the best deal through smart contracts. [16]

Some of the other areas where Blockchains can be implemented in the Manufacturing sector would be:

- Supply chain financing and vendor agreements
- Fixed asset management and reconciliation (also for banks)
- Intra group funds management and remittances
- Invoice Discounting and supplier finance authentication
- Alternate Credit rating (integrated e-KYC covering rating agencies, Social Security agency and other individual entity data)
- Treasury management

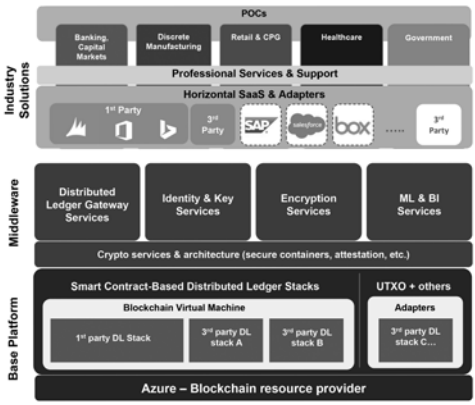
Microsoft and Blockchain

Blockchain Technology still being in its infancy needs to be nurtured and patronized. Nurturing involves getting a large part of the stakeholders on a platform where they can 'Develop-Test-Deploy' blockchain applications. Microsoft with its partners offers a bouquet of ready to deploy solutions on its Azure platform – 'Blockchain as a Service' (BaaS).

Tenets of MS BaaS strategy are:

- Create and Innovate by building solutions on blockchain quickly
- Mix and Match from the best available blockchain technologies. Multiple options like Ethereum, Ripple, etc. are available on Azure.
- Fail fast and cheap for developer community in a development and test environment
- Share Solutions through a worldwide distributed platform
- Provision with one-click to test and iterate

The roadmap for Microsoft's Blockchain offerings is represented below.



https://azure.microsoft.com/en-in/solutions/blockchain/

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[16] http://venturebeat.com/2016/11/20/how-blockchain-can-change-the-future-of-iot/

Managing Fraud
Different, Disjointed Approaches by Organizations Not Curbing Fraud

Rohit Mahajan*

Corporate India believes fraud will rise in the coming years, according to majority of respondents to the India Fraud Survey, Edition II, by Deloitte. About 70 of respondents representing large organizations (multinationals and domestic companies), 54% of respondents representing small and medium enterprises, and 65% of working professionals indicated corporate fraud would rise in the future.

'Diminishing ethical values' was identified as the most common cause for fraud by respondents across categories. Respondents continued to identify known frauds such as bribery and corruption, diversion/theft of funds and vendor favoritism (only large organizations) and conflict of interest (only small and medium enterprises) as top fraud schemes that their organizations had experienced in the last two years.

While concerns around fraud appeared similar, the methods employed to mitigate fraud reveal vast differences in approach within organizations, signaling that fraud is complex and organizations have a long way to go in effectively mitigating fraud.

Large organizations continue to focus on well-known frauds, unprepared to tackle new frauds

In the area of fraud prevention, large organizations appeared to be focused on preventing only historically known frauds, and appeared inadequately prepared to tackle new frauds such as social media and anti-competitive behavior. For instance, on social media, the majority of respondents did not share an opinion on how their organizations would handle smear campaigns, which is a potential reputational risk. About 68% respondents also believed there was misuse of intellectual property by unauthorized users and another 65% said there was use of fake profiles masquerading as the company to fool customers. Many organizations have been unable to keep up with the advancements in the hacking ecosystem and remain equipped with old cyber security models designed to keep the 'hacker-of-the-90s' out. In line with this, about one third of survey respondents said they didn't discuss cybercrime incidents internally for fear of tarnishing their reputation.

Fraud was mostly detected through whistleblower hotlines. Response to

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fraud was complex and determined on a case to case basis – 43% of respondents said investigations were commenced based on the severity of fraud; 36% said the fraudster was allowed to resign in lieu of pressing legal charges; and 33% said fraud was communicated to employees, the board and regulatory agencies.

It is disconcerting to note that large organizations do not appear to be stepping up to face the challenge of mitigating new fraud and noncompliance risks. While we observe increased adoption of automation and continuous monitoring as part of fraud risk management, it appears that these initiatives may be unable to detect new and emerging frauds. New frauds call for new preventive measures such as having a cyber incident response plan to tackle large scale hacking or managing employee accessibility to social media at work (to safeguard against social media fraud), or undertaking specific training programs to sensitize employees to the risk of anti-competitive behavior.

Small and medium enterprises indicate lack of commitment to tackle fraud

About 48% of respondents representing small and medium enterprises felt there wasn't enough commitment to tackle fraud. In line with that 42% felt there was inadequate budget and resource allocation to prevent fraud. About 32% felt complying with anti-fraud regulations placed additional burden on them. The top three measures undertaken to prevent fraud included: Independent Audits (71%), implementing a code of conduct (62%), and regular monitoring and assessment of fraud risks (52%). Fraud was most likely to be detected by accident.

Around 25% of respondents indicated that their organizations reviewed fraud risk management frameworks only upon an incident occurring and 23% addressed fraud observations within 1-2 months of the incident. Deploying technology to curb fraud appeared to be a challenge with 17% of respondents citing budgetary constraints, and 23% claiming lack of clarity around the utility of such tools. Response to fraud continued to be driven by the materiality of fraud (19%).

Small and medium organizations appear to be struggling to mitigate even well-known frauds such as bribery and corruption. Given the inherent limitations of these organizations, there is need for government intervention to help tackle fraud. In this regard, increased digitization in all spheres of business combined with strong enforcement of anti-fraud laws may benefit small organizations.

Working professionals want to be part of organizations' fraud risk management efforts

A majority of working professionals believed that the primary responsibility to fight fraud remained with them (56%). They also remained optimistic about the effectiveness of laws in curbing fraud (47%).

About 70% of respondents felt that their employers provided enough

opportunities for them to share instances of unethical behavior. To better tackle corporate fraud, working professionals favored the following options: openly discussing fraud and educating employees (61%); recognizing and rewarding ethical behavior (59%); and naming and shaming wrong doers (57%).

In our view, successful fraud risk management efforts tend to go beyond strong internal controls or the presence of policies. Employees can play an influential role in the success of fraud risk management efforts. Nurturing a community of 'employee influencers' can help reinforce ethical behaviors and mitigate fraud. We are seeing several organizations designate certain employees as ethics champions to encourage other employees to demonstrate ethical behaviors.

Business developments will significantly impact the nature of fraud in the future

As organizations move towards embracing new technologies and business models, we are likely to see new potential exposures to fraud. For instance, the adoption of blockchain technology in some organizations globally has resulted in significant changes to the way security departments are structured. The Internet of Things (IoT) paradigm has exposed the inability of sensors to ascertain the genuineness of data provided to it for processing, leading to fraud. Portals enabling cashless transactions are exposed to hacking, and phishing, whereas online market place models have seen frauds such as site replicating and sale of counterfeit items. Tackling such frauds would be possible only if organizations understand them and design a robust mitigation plan.

About the survey

Deloitte conducted three separate surveys that saw a total of 309 responses and focused on three target groups – Large organizations, small and medium enterprises and working professionals - and collated the responses into a report. The India Fraud Survey report, edition II, has been developed on the basis of responses received to a questionnaire that was circulated to leading CXOs across all major sectors and companies working in the area of fraud risk management, as well as working professionals, in October and November 2016. For more information on the India Fraud Survey, edition II, you may access the full survey report here

Information for the editor for reference purposes only

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Bombay Chamber of Commerce and Industry Trust for Economic and Management Studies

The Bombay Chamber of Commerce and Industry Trust for Economic and Management Studies was constituted in 1996 by the Bombay Chamber of Commerce and Industry to undertake independent research activities on various economic and management issues and for providing analytical views on macro-economic scenario, industrial performance and other issues of topical interest.

The Trust started publishing the quarterly magazine 'AnalytiQue' for the quarter October-December in the year of 1999 to serve as an effective vehicle of communication between the government, industry, economists, thinkers, management consultants and scholars. In its short journey the magazine had some trying spells and after the issue of January-March, 2006 there has been no issue. However, after four years, the Trust published the next issue as Journal in March, 2010. While retaining its basic purpose and character, AnalytiQue now continues to serve members, who are drawn mainly from the world of business and commerce and deals with contemporary economic issues while documenting some of the important developments of the Indian economy.

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