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Technology and Compliance in Securities Market in India

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Abstract

India has become a testimony to witness significant developments in compliance and technology in the securities market. The Securities Exchange Board of India plays a vital role in the regulation of the securities market in India. It was established for the smooth functioning of the market and to protect the investor interests. As, technology has in many ways become a boon for mankind, the role of information technology, artificial intelligence and other technological advancements has paved its way and delved into the Securities Market enabling individuals to purchase stocks at ease. After scams such as Harshad Mehta case various initiatives have been put forward to protect the investors interest and prevent any malpractices in the securities market. It can also be seen that India has also been leveraging compliance with the help of technology such as different AI strategies, Blockchain, Reg Tech and Fin Tech as these ensures that all the legislative framework governing securities market is at compliance with the laws. Compliance is one of the key features that denotes market integrity, is being influenced by rapid technological advancement which is dealt in this paper. This paper gives an overview on how technology is facilitating compliance and deals with various types of technologies which is aiding in compliance.

Keywords: *Technology, Blockchain, FinTech, RegTech, compliance.*

I. Introduction

With the introduction of Securities Exchange Board of India Act, 1992, India has undergone many major developments in the securities market. It was predominantly established after the Harshad Mehta scam which revealed many loopholes in the regulation of the market with the intention to protect investor's rights, prevent insider trading, and formulate rules, regulations and guidelines. It was established on 12th April 1992.

The Securities Contracts (Regulation) Act, 1956 defines "securities" and it includes shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of like nature in or of any incorporated company or body corporate, government securities, derivatives of securities, units of collective investment scheme, interest and rights in securities, or any other

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instruments to declared by the central government.[2]

A universally acknowledged fact that without finance the securities market would not be able to function effectively. Therefore, understanding securities market becomes very crucial for one to understand. A security market is a component of financial market where different financial instruments such as bonds, stocks and derivatives are bought and sold. As capital plays a major role, these financial instruments are generally issued by companies and government to raise capital. Securities market also plays a major role in the economy due to the allocation of capital across the economy by offering a platform to the investors to trade i.e., to buy and sell securities.

There are also segments within the Securities market in India which includes (i) Primary market and (ii) secondary market.

The main objective of the primary market is to raise capital from the public. The process involves when a company for the first time it is known as Initial Public Offering (IPO), when the company raises capital again from the public it is known as Follow on Public Offering, though the process may vary. Sometimes, it is also to be noted that An Offer for Sale takes place when investors like venture capitalist and angel investors fund company which maybe operating as a private limited company, when such shares of already existing shareholders like venture capitalist are issued to the public, it is known as offer for sale. [3]

Another segment of securities market, i.e., secondary market's main function comes into existence once the shares are issued to the public in the primary market they must be listed in the Stock Exchange in the securities market. To provide liquidity which will help the investors to buy and sell stocks. The investor can have the flexibility to capitalise and exit their investment and can adjust their portfolio according to their requirement.

(A) Review of Literature

In the article titled "Reg-Tech: Technology driven compliance and its effect on profitability, operations and market structure", the authors mention that despite there is a technological revolution in the financial market, yet they lack evidence on the Reg Tech investment and their operations. In this paper they tried to demonstrate that the compliance requirement made by firms made BDs to invest more in the Enterprise Resource Planning which helps in the compliance process. However, it was seen that implementation increased IT budgets while

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[2]Sahoo, M. s (2002) *An Overview of the Securities Market in India*, *THE INSTITUTE OF COMPANY SECRETARIES OF INDIA*. Available at: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=3a0c18c52252d76e2e12a0d2358598b605b81afa#page=32 (Accessed: 25 March 2025).

[3] *Understand the basics of securities markets* (2020) *National Institute of Securities Markets (NISM)*. Available at: https://www.nism.ac.in/knowledge_base/understand-the-basics-of-securities-markets/ (Accessed: 29 April 2025).

profits decreased substantially, for some companies. It was seen that with the implementation of these technology there were less customer complaints and the organisation's data was organised.[4]

As technology also facilitates improvement in regulatory compliance, yet some factors that affect technology and blockchain is the uncertainty of regulation, adoption of technology. There are also issues related to cybersecurity as high as 51% of privacy violation has occurred, which in turn leads to barriers when technology is ought to be adopted. (Lamarque, 2016)[5]

Vikas Prabhu (2022) mentions that many emerging practices in the field of cybersecurity and AI and ML has a key role to play in this regard. They can also be used for risk profiling, credit estimate, and fraud detection.

Patil, Chandrashekhar & Bhoite, Sachin & Patil, Harshali. (2023) mentions that Fintech is also one of the major disruptors in the financial market as many people are able to use it today through the means of internet and smartphones. [6]

Another article "Artificial Intelligence Techniques in Financial Trading: A systematic literature review" reviews 143 articles that adopted AI techniques in financial market and mentions that even though in markets technology has been implemented yet, it still faces challenges in data quality, changes in the economy and market. It mentions that even minor change in the market structure can affect it significantly.[7]

(B) Objectives

The objective of this paper is to give an overview of the technological advancement in the securities market and provide an insight into various types of technology used for compliance in India. With strict regulation and policies that has been set out, it has been seen that firms are adopting technology for better compliance. Therefore, the primary objective is to give an overview on how technology is aiding in regulatory compliance.

(C) Methodology

The research is doctrinal research where emphasis has been given to the various kinds of

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[4]) Charengong, B. *et al.* (2024) *Regtech: Technology-driven compliance and its effects on profitability, operations, and Market Structure*, *Journal of Financial Economics*. Available at: https://www.sciencedirect.com/science/article/pii/S0304405X24000151 (Accessed: 03 April 2025

[5] *Blockchain for the traditional stock markets* (2024) *ResearchGate*. Available at: https://www.researchgate.net/publication/378804271_Blockchain_for_the_Traditional_Stock_Markets (Accessed: 19 March2025).

[6] Patil, C.H., Bhoite, S.B. and Patil, H. (2023) *(PDF) challenges in Fintech Security*, *Researchgate*. Available at: https://www.researchgate.net/publication/372717484_Challenges_in_Fintech_Security (Accessed: 03 April 2025).

[7] Dang, Q. V. (2019, December). Reinforcement learning in stock trading. In *International conference on computer science, applied mathematics and applications* (pp. 311-322). Cham: Springer International Publishing.

technology that is being used by the organisations for effective implementation. The study is based upon on secondary data from journals, articles, and financial websites.

II. BLOCKCHAIN

The concept of blockchain is widely used in cryptocurrencies and other digital currencies. Satoshi Nakamoto first formulated the concept of blockchain. It was first introduced in his research paper "Bitcoin: A Peer-to-Peer Electronic Cash system." Blockchain is defined as an "immutable public ledger or distributed record database of all digital events and transactions that have been executed and shared by all the participating entities." [8]

Blockchains were first used in the structure of bitcoin but today we can see that many firms are also adopting it into their operation. The most crucial goal for any firm is to earn profits. Hence, many firms to increase efficiency, streamline costs are adopting blockchain in their firms. Blockchain today is set to be in the fourth generation. The blockchain came into the market, after one year due to the financial crisis. This crisis led to much dissatisfaction. Yet, a need was there for such a technology where compliance could be met efficiently. As, during the crisis the regulators seemed to be underpaid and many large firms such as the insurance firms seemed "too big to fail".

Advantages of Blockchain

- Decentralised solution

It offers decentralised solutions; transparency and all the transaction take place in global agreement in the securities market which helps the market to grow and also make an advancement in the traditional stock market. It helps to keep a transaction record on how much an individual has, therefore, enabling to have a better compliance. It is decentralised as several computers maintain the transaction rather than a centralised system.

- Application of blockchain

Since it is decentralised, blockchain is offered across many industries, not only in terms of finance but other industries as well such as the smart contracts, cryptocurrencies, healthcare, other financial services, real estate, identity management etc.

- Smart Contract

Even though there are number of applications for smart contracts yet, blockchain is deemed to be one of the crucial technologies that is revolutionising the smart contract. The primary goal

[8] *Blockchain for the traditional stock markets* (2024) *ResearchGate*. Available at: https://www.researchgate.net/publication/378804271_Blockchain_for_the_Traditional_Stock_Markets (Accessed: 19 March2025).

of smart contract is to foster compliance and eliminate all the third parties, as it helps to have a better compliance with the rules which has been laid down.

- Cost effective

Blockchain technology is cost-effective it is low cost and maintaining it becomes significantly low. Therefore, this will in the future have less transaction costs.

- Immutability

When a data is entered in the blockchain, it is immutable as the data cannot be altered. Therefore, this helps to keep the transaction history secure ensuring a better and reliable system where transactions cannot be altered.

- Operational efficiency

Cryptographic protocol is offered by blockchain. It is used to speed up the transaction as it eliminated ledgers, intermediaries and transactions that require more time.

Therefore, when it is used in stock market it ensures efficiency.

III. Fintech

FinTech or Financial technology has gained popularity over the years, today it has become one of the largest disruptors of financial technology. In India, the Fintech is still at its early stage, however it can be seen that a number of startups have already materialised it. As there is no definition for Fintech it is considered as an industry to make efficient financial service and financial management. FinTech is not a new concept it has been developing and growing towards the years to come. It can also be seen in SEBI report of 2020 that the growth of Fintech has grown worldwide in Retail Investors where it grew from 39% to more than 6 crores. Thus, we can also see today that apps such as Zerodha, Upstocks, Grow and many of them are using automated systematic investments. [9]

Advantages of FinTech

- Prevention of money laundering

This issue is faced in the financial market globally. The use of Blockchain along with Fintech in the helps to tackle this issue, as distributed ledger solutions help to identify those financial transactions which seems to be vague, as it can see in these transaction number of parties

[9] Giri, S. (2023) *Adoption of Fintech in Financial Market Transactions A Study of Retail Investors of Bombay Stock Exchange and National Stock Exchange, Department of Applied Business Economics, Faculty of Commerce Dayalbagh Educational Institute (Deemed To Be University)* . Available at: https://shodhgangotri.inflibnet.ac.in/bitstream/20.500.14146/9262/1/synopsis.pdf (Accessed: 28 March 2025).

involved and differences in currency denomination.

- Assists the Banking Sector

FinTech helps in banking sector as banks have struggled to provide innovative ways of services to the customer. It is found that traditional system is slow and inefficient, with the help of these distributed ledger technology, it can cater to the needs of the customer in the banking system and also enhance their services.

- Development of Unified Payment Interface

After, demonetisation and Covid-19 Pandemic, one of the significant improvements in the Indian Financial System and in the development of Fintech is UPI. Since there is a growth of Central Bank Digital Currencies (CBDC), tit will also help to reduce our dependence of cash, with institutional like this. It is likely to grow.[10]

IV. RegTech

RegTech also known as regulatory compliance is the use of technology to facilitate compliance, navigate risk and helps in reporting to the financial institutions. It helps firms in compliance with efficiency and agility. It also helps Banks and other financial institutions to ensure compliance while adapting to the technological changes. Companies invest in RegTech to save time and money.

Advantages of RegTech

- Streamlining KYC/AMC

RegTech ensures that it streamlines KYC/AML process as it simplifies them. This is primarily done by identification validity, risk assessment and monitoring of the customer activity. The use of AI and ML in this regard would also help to reduce human errors.

- Establishes reputation and trust

One of the main components for a business to function is trust of the customers. RegTech ensures that the organisations comply with the data protection regulations. It employs various tools for this. It primarily includes encryption technologies and robust data governance.

- Data Protection

One of the essential features of RegTech is data protection. With the introduction of DPDP Act

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[10] *Annual Report-RBI* (2024) *Reserve Bank of India - Annual Report*. Available at: https://rbi.org.in/Scripts/AnnualReportPublications.aspx?Id=1404. (Accessed: 01 April 2025).

in India, it encourages organisations to take effective measures against data protection.

- Regulatory reporting

One of the important functions of RegTech is that it efficaciously uses cloud-based methods and Artificial Intelligence for the preparation of report. This makes many firms to implement this technology as it requires less time. One of the main features here is that errors is reduced as much as possible in order for automation. Currently ERPs are used by the organisation to meet the compliance requirement which is followed by AI and API.

V. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Stock forecasting is one of the important functions which allows investors. AI and ML have transformed how the financial institutions work and is also keen in making numerable efforts for compliance in these financial sectors. AI and ML both these tools are significantly used to detect anti money laundering and helps to regulate the compliance in this financial market. It can also be seen that when AI and Natural Language Processing also known as NLP is combined, it can be seen that when it is combined into compliance system it boosts efficiency and is effective. However, this does not mean that human guidance is not required. These technologies have become a major role for aiding compliance.[11]

Some of the AI investment strategies includes:

- Predictive Analytics: It can be seen that many AI strategies like predictive analytics helps also investors to foresee the market trends, Henceforth, making investors to choose the stocks which has high potential. Thus, maintaining and enhancing the portfolio of the shareholder.
- Robo-Advisors: They are effective for maintain the portfolio of the investors. They outperformed human based services and are also cost-effective.

However, even with these technological advancements Human Oversight is still needed for the functioning of the financial services, as machine cannot totally replace humans.[12]

VI. KEY DISCUSSION ON FINTECH, REGTECH AND BLOCKCHAIN

As one can see that the evolution of FinTech is from the establishment of ATMs, and it is a concept which is not new unlike blockchain. Blockchain one of the technologies used in

[11] Balakrishnan, A. (2024) *Leveraging Artificial Intelligence for enhancing regulatory compliance in the financial sector, SSRN*. Available at: https://ssrn.com/abstract=4842699 (Accessed: 29 April 2025).
[12] Khanna, P. (2021) *Allfinancejournal, International Journal of Research in Finance and Management*. Available at: https://www.allfinancejournal.com/article/view/248/6-2-15 (Accessed: 05 April 2025).

blockchain appeared it would grow at high pace but in the current scenario not much research has been done in this field as it is constantly evolving. With the cryptocurrencies and bitcoin in the digital market, these have gained popularity among the youth.

In India, Fintech has seen a massive growth, due to governmental policies like the Digital India, it was a campaign was one of the key factors that India has become ahead in the world in terms of online payment particularly in UPI transactions.[13]

Companies are also using RegTech for meeting the compliance requirements and identifying the financial risk. It can be seen that as cross-border regulation is on the rise RegTech can prove itself by showing that it is effective in the compliance process in this area.

Henceforth, it can be said that in the future blockchain can be effective in both RegTech and FinTech which can be used in the base layer. With the passage of time, these technologies have the potential to grow even more. Thus, it can be said for effective compliance these three technologies can be beneficial for the financial institutions.

VII. CHALLENGES IN IMPLEMENTING THESE TECHNOLOGIES

- Data Security

The main concern with the use of AI in this era is data security. As today, data consists of important and confidential information in the cyberspace. There is always a threat for data misuse. Many individuals provide their sensitive data in the financial market, there is always a concern regarding the data protection. Unlike, GDPR act like the EU, India does not categorise personal data and personal sensitive data. Thus, it raises a concern on this point regarding data safety. As laws would also need to be at the same par at technology so as to prevent misuse.

- Early Stage of Development

It is only after covid-19 pandemic, that the technology has taken a revolution. Though these technologies were already existing before it, but it has not been much time since it has come into existence. There is also a need of proper regulation. Regtech, Fintech, Blockchain these technologies are evolving. Hence, there should also exist proper legal framework to address them. The current legal framework is outpaced by these evolving technologies.

- Limited Services Liability

[13] Deepshikha, Makhija, R. and Dr. Yamini (2025) *Cashless India: A comparative analysis of digital payments and their impact on the economy*, *International Journal of Law Management & Humanities*. Available at: https://ijlmh.com/paper/cashless-india-a-comparative-analysis-of-digital-payments-and-their-impact-on-the-economy (Accessed: 02 April 2025).

It is seen in many of the cases that access to fintech can be limited, due to regulatory compliance.

- Cybersecurity

With the evolution and growth of FinTech the market has been susceptible to more susceptible to damages. This in turn leads to cybersecurity threats, data theft from scammers and hackers using the internet and other electronic devices. Despite various security the heist of Bangladesh which was implemented through SWIFT shows about several challenges and drawbacks of the FinTech.[14]

- Technical Complexity

It requires an extensive knowledge about this technology as it is very vast. When these technologies are implemented in the traditional market there can be instances when challenges arise regarding implementation of these technologies.

- Oversight

Even though these technologies help in compliance, yet AI and ML still need oversight and updated as it needs to get checked from time to time for effective implementation of these technologies in the financial institutions.

VIII. REGULATORY FRAMEWORK

The following contains the regulatory framework for the functioning of securities market in India:

- SEBI

As we know that SEBI was established in 1988 for the functioning of securities market and to protect investors interest.

- Ministry of Finance[15]

It overlooks and has the power to control securities market through SEBI Act, SC(R)Act and the Depositories Act, 1966. The main function concerned with the economy. The Department of Economics also deals with the financial market mainly the capital market of our country.

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[14] Arner, D.W., Barberis, J.N. and Buckley, R. (2017) *(PDF) Fintech, Regtech, and the reconceptualization of financial regulation*. Available at: https://www.researchgate.net/publication/320109794_FinTech_regTech_and_the_reconceptualization_of_financial_regulation (Accessed: 06 April 2025).

[15] Singh, G. and Goel, N. (2018) *Researchgate | find and share research, www.researchgate.net*. Available at: https://www.researchgate.net/publication/326469624_The_Role_of_Technology_and_Regulations_in_Capital_Flow_to_India (Accessed: 25 March 2025).

- RBI

The RBI has the central role in India's securities market as it has control over the function of monetary policy. It also plays an important role in coordination between SEBI when banking is involved. It also plays a key role in managing foreign exchange. Thus, primary function is to stabilise the currency.

IX. FUTURE TRENDS

As SEBI is the central regulatory body which looks after the functioning of the security market. We can also see that India is also progressing in digital payment using Fintech. Reports show that in 2024 in India, 18.41 trillion transactions took place in January which is a tremendous increase. It is 42% increase in value as contrast to the same month last year.[16]

Until 1955, the traditional method was followed in Stock Exchange in Securities Market in India. The concept of trading was not wider among the people as trading was done in paper format and it was complicated. With the introduction of Depositories Act, in 1955, the concept of "Dematerialisation" was laid out in order to eliminate the risk of share trading paper format. Dematerialisation also known as Demat in short, was introduced in the Indian Financial Market to eliminate the risk associated with the traditional paper format.[17]

While SEBI has modified its regulations, there are still issues pertaining to implementation, this is a way affects the trust of the investors. However, despite this it can be seen that today India is growing to be one

One of the key aspects of Artificial Intelligence, Reinforcement Learning also known as RL is getting momentum in the financial market, although it's not that widespread. However, unlike other AI and MLs which uses historical data to produce outcomes. It is based on optimal learning with focus on trial and error in the changes that occurs. This can be effective in financial market where it is evolving.[18]

[16] Standard, B. (2024) *UPI transactions reach a record Rs 18.41 trillion in January: NPCI data*, *Business Standard*. Available at: https://www.business-standard.com/finance/news/upi-transactions-reach-a-recordrs-18-41-trillion-in-january-npci-data-124020101108_1.html. (Accessed: 25 March 2025).
[17]Noble, D. and Patil, K. (2021) *(PDF) blockchain in stock market transformation: A systematic literature review*, *Research gate*. Available at: https://www.researchgate.net/publication/354643894_Blockchain_in_Stock_Market_Transformation_A_Systematic_Literature_Review (Accessed: 25 March 2025).
[18] Agrawal, V. and Magar, A.V. (2024) *(PDF) AI-Driven Investment Strategies: Opportunities and limitations in financial markets*, *www.researchgate.net*. Available at: https://www.researchgate.net/publication/383647363_AI-Driven_Investment_Strategies_Opportunities_and_Limitations_in_Financial_Markets (Accessed: 28 March 2025).

X. Suggestions

- Effective regulation

While there are a number of steps taken by SEBI to reduce insider trading and other malpractices but however when we compare it to other countries for instance, USA, it seems that SEC is quite well-established and mature than SEBI. Thus, SEBI must also blend together with the technology that arises. [19]

- Data Protection

The risk of data misuse is one of the concerns that is evolving with regards to technology. As many sensitive information is provided during the use of these financial services. As Section 43 A of the IT Act, 2000 has been omitted by the DPDP Act. Hence, in India, it lacks in distinguishing between 'personal data" and 'sensitive personal data'. As sensitive personal requires higher degree of protection. Hence, the government must foresee this issue as their sis number of sensitive information provided by the users while using the financial services.

- Updating the technology

Even though, this technology seems to be effective but with the growth of AI, ML and Deep Learning, there is always a threat where cybercriminals can get access to the system. Therefore, for effective implementation of these technologies, the system must be updated frequently, in order to eliminate any loopholes that is existing in the system so as to prevent any harm to the stakeholders.

XI. Conclusion

In conclusion, it is evident that the growth of these technological advancement is beneficial for the functioning of the securities market. With time, effective laws have been implemented for the protection of the stock market. Yet, with digitisation the problem of data safety also arises. When it comes to blockchain, many research mentions that there are many areas where there is a lack of research in blockchain. Through this paper it can be seen that there must be a balance between utilising the advantage of these technology and limiting the challenges.

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[19] Tanu, T.C. (2025) *Topic: Comparative study of India and USA on working of securities market, SSRN*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5072514. (Accessed: 01 April 2025).