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Digital Transaction for New Economic Transformation of India: Regulatory and Ethical Issues in the Use of AI

Sriram Divi[1], Manoj Kumar Sahoo[2], Venkatram Reddy Minampati[3]

Abstract

India is undergoing digital transformation so far as digitalization of payments is concerned. India's revolutionary payments platforms, online and mobile banking, e-commerce transactions and third-party payments apps have attracted attention of both developed and developing countries. Research methodology adopted is descriptive and based on secondary sources. More than twenty countries have accepted India's UPI payments platform for digital transactions. Moreover, India is intensively expanding digital penetration in rural areas through Aadhar enabled payments services vie the JAM Trinity i.e. Jan Dhan Accounts, Aadhar citizen identity cards and Mobile data services. Along with all these however, increasing use of Artificial Intelligence (AI) is seen for facilitating all sorts of e-commerce and digital transactions. This throws immense regulatory and ethical issues towards management of AI especially in digital payments and transactions. This paper delves into the current scenario of digital transformation in India and use of AI by different entities. Further this paper explores the ethical and regulatory dimensions of usage of AI in digital transactions. The paper argues the case for urgent development of regulatory mechanism for AI usage in the digital payments spectrum in India and incorporation of ethical issues in it.

Keywords: *Digital Transaction, Economic, Transformation, Digital Payments, Artificial Intelligence, Regulation, Ethical Issues.*

JEL Classifications Code: L14, L51, G18, H87

Introduction

India is undergoing digital transformation so far as digitalization of payments is concerned. India's revolutionary payments platforms, online and mobile banking, e-commerce transactions and third-party payments apps have attracted attention of both developed and developing countries. More than twenty countries have accepted India's UPI payments platform for digital transactions. Moreover, India is intensively expanding digital penetration in rural areas through Aadhar enabled payments services vie the JAM Trinity i.e. Jan Dhan Accounts, Aadhar citizen identity cards and Mobile data services. Along with all these however, increasing use of Artificial Intelligence (AI) is seen for facilitating all sorts of e-commerce and digital transactions. NITI Aayog, a Government of India policy think tank, defines Artificial Intelligence as "AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making." (NITI Aayog, 2018). This throws immense regulatory and ethical issues towards management of AI especially in digital payments and transactions.

Digital Transaction Ecosystem in India

Digital transaction has revolutionized the payments landscape in India. Indian government's flagship programme "Digital India" has been instrumental in shaping up Faceless, Paperless and Cashless transaction system in the country. The Indian Government has made the development of digital payments its top priority in an effort to formally include every section of the nation in the digital payment system for enabling every citizen to make seamless digital payments in a fast, easy, safe, and comfortable way.

[1] Associate Professor, Department of Public Policy and Administration, Pandit Deendayal Energy University, Gandhinagar, Gujarat, India., Honorary Research Associate, Faculty Management Sciences, Durban University of Technology, ORCID: 0000-0003-0886-771X, Email: sriram_divi@yahoo.co.in.
[2] Visiting Professor, Pandit Deendayal Energy University, Gandhinagar, Gujarat, India, ORCID: 0000-0002-2476-5230.
[3] Associate Professor, Department of Public Policy and Administration, School of Liberal Studies, Pandit Deendayal Energy University, Gandhinagar, Gujarat, INDIA, Email: ramreddyrr@gmail.com, (Corresponding Author), ORCID: 0009 0006 4863 2121.

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In India, digital transactions have grown at an unparalleled rate during the past three years. Various payment methods such as Prepaid Payment Instruments (PPIs), National Electronic Toll Collection (NETC) system, Unified Payments Interface (UPI) and Bharat Interface for Money (BHIM), the Immediate Payment Service (IMPS), and other simple and user-friendly digital payment methods have all experienced significant growth and have transformed the digital payment ecosystem in the country (Agur et al., 2017).

This has led to voluminous growth in overall individual P2P and retail P2M transactions. BHIM-UPI along with third party app enabled payments such PayTM, Phone Pay, Google Pay, Aadhar Enabled Payment Services (AePS) along with online banking and mobile banking have turned out to be the favourite payment modes in the country. Moreover, India's Central Bank the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI) have geared up to facilitate UPI payments for foreign tourists coming to India even without holding a bank account in India. For enabling this they have technological tie up with Singapore's PayNow. This has further aroused significant interests among more than twenty countries to have linkages with India's UPI digital payments platform (Mansoor and Paul, 2022).

Additionally, since December 2022 the Reserve Bank of India (RBI) has introduced e-RUPEE or e-INR, a contactless and cashless digital payment method that is anticipated to significantly increase the efficacy of Direct Benefit Transfers (DBT) in the country. It is a variant of the Central Bank Digital Currency (CBDC) launched by RBI so as to counter the influence of crypto assets in the country (RBI, 2022). All of these resources have shaped a strong digital payments and digital finance ecosystem in the country.

The JAM Trinity (Jan Dhan, Aadhaar, and Mobile) has turned out to be the primary facilitator at the heart of India's revolutionized digital payment landscape. One of the largest global efforts to promote financial inclusion, the Jan-Dhan Yojana (PMJDY) was introduced in August 2014 by the Government of India with the goal of giving all unbanked households access to universal banking services. Together, Jan Dhan zero balance bank accounts, Aadhaar- the biometric data enabled unique identification card, and mobile phones have contributed to building the groundwork for digital transformation of India, where citizens may be able to use varieties of payment services and directly access a wide range of public services with greater convenience. All these steps have been taken under the broader schema of Digital India programme launched by the Government of India for transforming India as a vibrant digital ecosystem.

Digital payments in India is estimated to grow by 80% during 2020 to 2025 and poised to reach three-fold by the year 2030, as per the Price Waterhouse Cooper forecast (Stanly, 2023). The new age of digital payments was ushered in with the implementation of the Unified Payments Interface (UPI) digital transaction platform in 2016. UPI enabled transactions now make up 4.5 times the amount of credit and debit activity in the country Due to its versatility, UPI payments have now transformed the way all small businesses and vendors make and receive payments. India's digital finance ecosystem is poised to enter the era of "Payments 4.0", where voice-enabled payments would play a significant role, due to the latest technological breakthroughs taking place across the world and within the country. India's entire fintech and digital finance industry is poised to undergo new economic transformation due to the upcoming "voice-integrated payment systems" in the near future, taking over the overall digital payments landscape.

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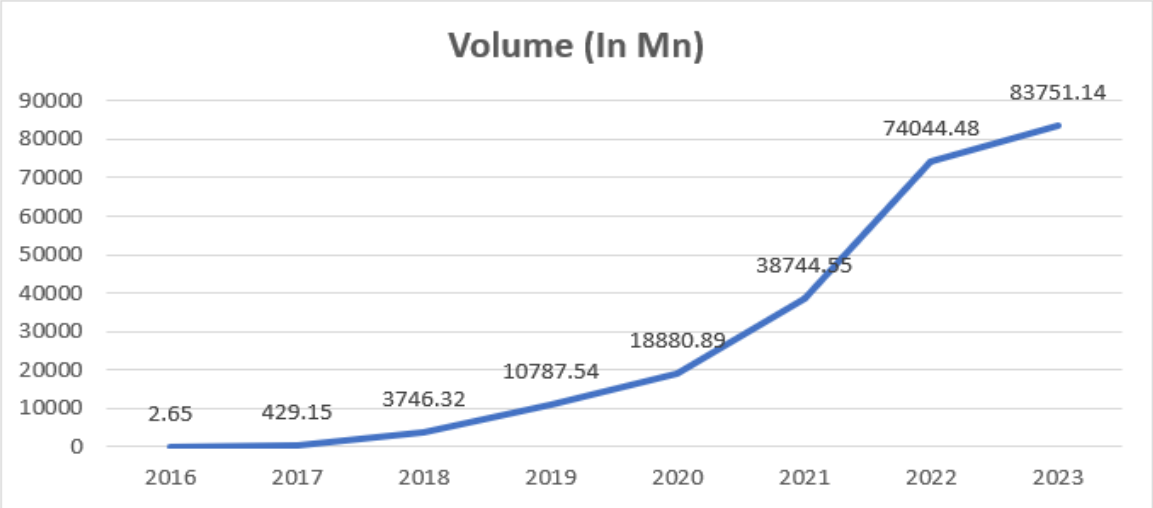
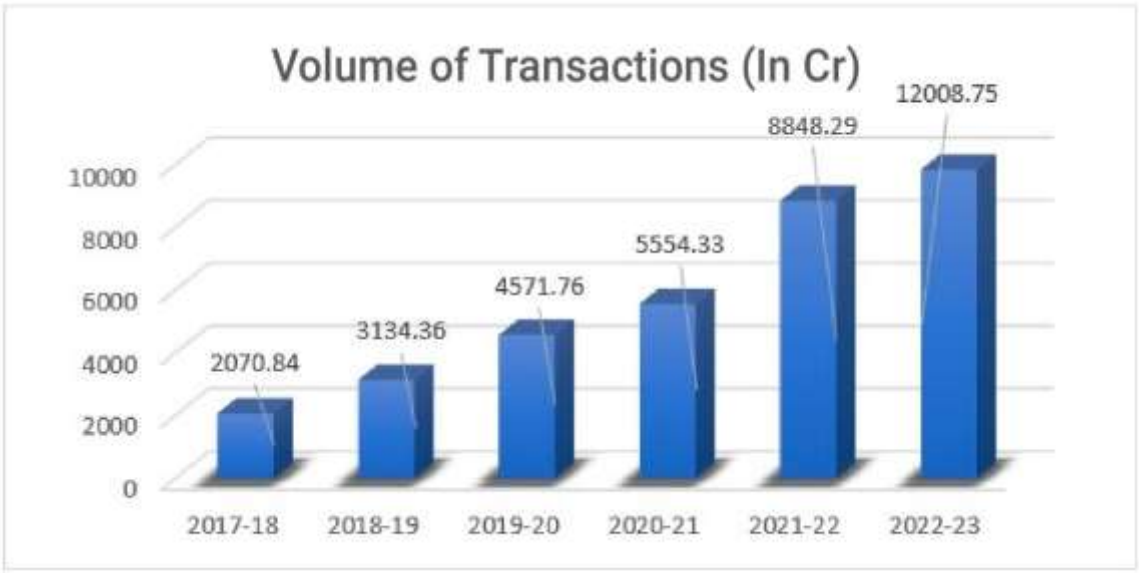
Figure 1. Growth in No. of Digital Transactions in India (2016-2023) (Millions)



Source: Prepared by author, 2024

The volume and value growth in digital transactions have grown immensely from its nascent phase in 2016. The volume of digital transactions grown exponentially from just 2.65 million transactions in 2016 to 83,751 million in 2023 (Figure 1). This translates into a voluminous growth in transaction value of INR 2070.8 crore (INR 20,708 million) in 2017-18 to INR 12008.7 crore (INR 120,087 million) in 2022-23 (NIC, 2023), (Figure 2). The increasing use of latest technology and Artificial Intelligence in the fintech and digital payments spectrum bears further potential for digital transaction growth in the country.

Figure 2. Growth in Value of Digital Transactions in India (INR Crores)



Source: Prepared by author, 2024

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AI and Digital Transaction Ecosystem in India

The year 2023 has been the Generative AI breakout year in the world (Almeida, 2023), with advancement of Chat GPT 4 variant Natural Language Model tool, which led to the penetration of AI application in diverse fields including digital transaction and fintech space. The benefits of AI technology percolates into in accessibility, efficiency, and reduction of human error. AI has helped advance digital transactions, provide customized services for the customers and promote financial inclusion. It is estimated that by 2032, the market for generative AI will touch $1.3 trillion, and by the end of this decade, 70% of global business is poised to use AI, leading global GDP boost by 14% (Kovacevich, 2023). The following latest AI enabled technologies are driving the growth of the digital transformation landscape in India and across the world.

Voice Enabled Digital Payments System: In 2016, PayPal became the pioneer payment provider to provide voice-activated technologies for digital payment transactions. Other such AI technology tools are the voice chatbot developed with "Rasberry Pri" and "Amazon Lex" for the Eyowo payment platform. Another voice-enabled AI solution that streamlines traditional digital payments is "Voice Pay"- which uses voice for payments, and Tymoszek designed "DashCam System", a face-cum-voice-enabled payment tool that facilitates vehicle movement as well.

AI Powered Voice Assistants: The "Google Hands-Free" app uses AI powered voice assistants by integrating "Android Pay"- Google's mobile payment system, for enabling the digital payment transaction. Over a million merchants are estimated to be using Android Pay globally, which will further expand due to the Google's voice assistant usage.

RBI's AI Powered Voice Payments: The Reserve Bank of India has already announced since 2023 to include AI in digital payments- in particular, the "Conversational Payments"- on its Unified Payments Interface (UPI) platform (Online, 2023). National Payments Corporation of India (NPCI) is going to introduce the Conversational Payments system "Hello! UPI" on the UPI App integrating phone calls and IoT tools through its Server-Side Common Library (SSCL) platform. Existing "UPI 123Pay" is also getting ready on SSCL for integrating the conversational payment system (NPCI, 2023). These developments are poised to transform into the novel and next generation systems of conducting transactions.

AI Use in Digital Transactions

At present AI tools and apps are being used in a number of financial activities including digital transactions, banking, insurance, credit and risk assessment, financial assets management and securities analysis, portfolio management and so on. Forthcoming digital systems include unified convergence of technologies like Bluetooth, Wi-Fi, mobile sensors and inbuilt cameras for interactive transmission of payment information to the vendors' payment systems such as POS devices, digital apps and online payments platforms, and so on. Bank of America's virtual assistant "Erika" serves millions of customers in the US. Indian railway catering firm IRCTC's chatbot "Disha" serves millions of customers in booking railway tickets for enabling smooth travel experiences. Following prominent activities are being served by AI tools in the digital transaction spectrum in India and developed countries (Figure: 3), such as —

Prevention of Payments Fraud- enabling security features, identifying fraud payment activities, and providing real time information on suspicious transaction related activities and so on (Region, 2024).

Customer Support- Helping in solving queries, processing various service needs and aid in providing better customer experience (Morgan, 2017). AI is helping customers in reducing false declines in digital transactions as well.

Seamless Mobile Banking Facilities- AI powered chat bots are getting integrated with mobile banking apps for seamless mobile banking activities and other banking related customer services (Team, 2019).

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Retail and Commercial Services- Enable buying and selling activities, gathering, analysing and providing customer reviews and feedback. AI devices are getting attached with debit cards for seamless transactions as well.

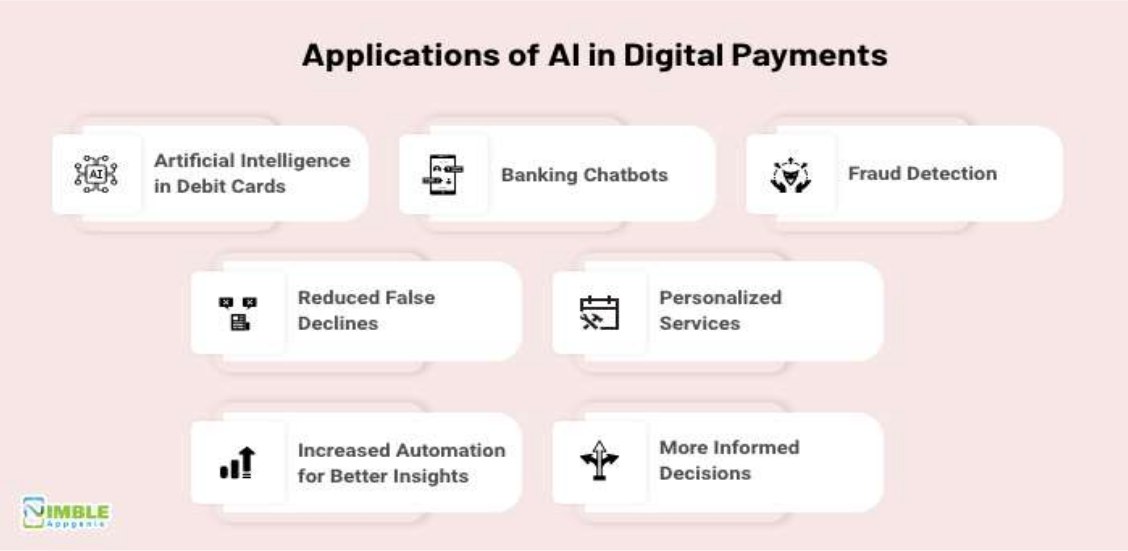
Evaluating Credit Worthiness and Underwriting- AI powered tools are being used for evaluation of credit worthiness, credit scoring and underwriting activities of customers and corporates. Better-informed decision-making is being driven by the AI usage.

Investment Management- AI tools are being used for investment and financial assets management based on digital and financial transaction history and priorities of the clients. Increased automation and data driven insights are being drawn by AI use here.

Risk and Compliance Assessment- AI is being used in risk and compliance assessment of businesses and getting integrated with digital payments.

Personalized Service- AI is being deployed to provide personalized services to the clients and customers so as to provide them with great experiences of financial and digital transactions. Add on services are getting customized for clients for providing various financial facilities based on their digital transaction patterns (Sharma, 2024).

Figure 3. Applications of AI in Digital Payments



Source: Prepared by author, 2024

Looking at India's voluminous growth in financial assets management, further rise in AI use in the industry is widely expected. India has the second largest HNI individuals in the BRICS countries reflecting in phenomenal rise (by 21%) in average Asset Under Management (AUM) of investors by June 2023. Total mutual fund AUM in India has grown phenomenally from just 4.3% of GDP in March 2003 to 16.9% of GDP by September 2022 (Figure 4). This will require more insightful data driven decision making in financial asset management in India and thus would lead to further deployment of advanced AI tools in the fintech industry.

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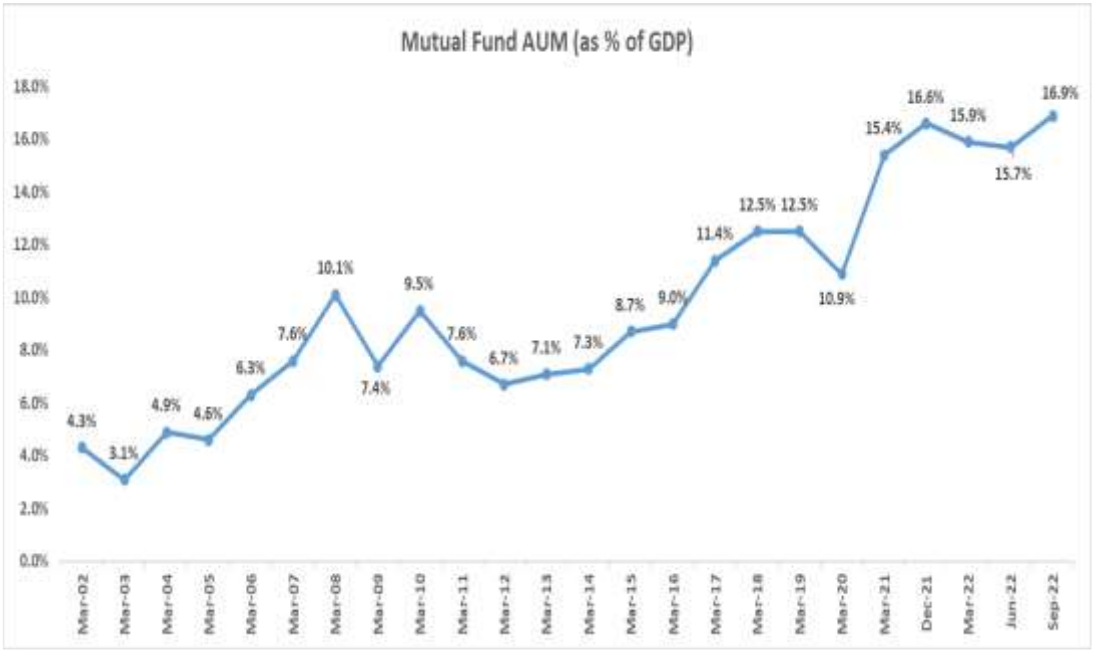
Figure 4. Growth of Mutual Fund AUM as Percent of GDP in India



Source: Prepared by author, 2024

It (Introbooks, 2020). For improved risk management and compliance, AI usage in India is further poised to grow in India as the volume and pace of retail loan applications has increased significantly, necessitating efficient and quicker risk assessment and credit worthiness evaluation. Retail credit is the largest segment in India compared to Industrial and services credit, which has overtaken the other two since 2021 and reached to INR 41 trillion by March 2023 (Figure 5). However, the increased use and deployment of AI applications throws a host of questions on their regulatory and ethical aspects. How these AI algorithms will be misused for gathering private financial information and based on that biased individual profiling will be done and misleading credit scoring and prejudiced underwriting will be provided, remain as major areas of concern related to the digital finance space.

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Figure 5. Growth of Retail Credit in India (INR Trillion)

Source: Prepared by author, 2024

Regulatory and Ethical Issues in AI Usage in Digital Transaction

The whole financial and fintech industry's business structure has been profoundly altered and improved by Artificial Intelligence (AI) applications and techniques. However, there is always a likelihood of misinformation, data loss, and ill-motivated financial profiling of individuals and entities because of wrongful and risky deployment of AI and moreover, Natural Language programs can be exploited by newer technologies. Numerous ethical problems and regulatory issues, such as erroneous credit rating, misinformation spreading, distortionary sales, unauthorized banking transactions, and so on have been found through the deployment of AI. Therefore, it is urgent to set up human oversight to guarantee moral observance and verify the real concerns about AI platforms. Hence, the need for a Regulatory Body for mitigating the possible risks associated with financial, digital payments and banking activities aided by AI is more than ever. Following risks along with regulatory and ethical issues are delineated due to unmindful AI usage in digital finance space, such as:

AI Biasedness: AI deployed research analysis and outcomes can be biased. It depends on the kinds of algorithm used in the AI system and tweaking in the programming language. Biased output generation can be significantly disastrous for smooth functioning of the digital and overall financial system.

Spread of Misinformation: AI algorithm can be deployed for disproportionate highlighting of the negative aspects of a financial data set so as to spread misinformation about an individual or entity's financial transaction or position. This can be immensely detrimental to the reputation of the person or the organization.

Bypassing Financial and Banking Regulations: AI can be used for smartly bypassing financial and banking regulations as well. Current Indian fintech crisis related to PayTM Payments Bank's non-adherence to banking regulations such as Know Your Customer (KYC) bypassing is a case in point. It is not clear whether AI has been used for enabling KYC bypassing in this case, but it is sure such crisis would be deeper if AI is deployed for bypassing banking and financial regulations.

Data Privacy Concerns: The threat of generative AI is utmost in the case of data privacy concerns. AI can be deployed for customer profiling related to their financial transactions and digital payments habits. This private data can be potentially misused against the individuals and organizations.

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Lack of AI Accountability: Financial intelligence is a complex practice that collects information related to risk assessment, observance to banking and financial policy, regulatory compliance, and customer due diligence. AI aided financial intelligence can possess lack of accountability, which can be a grave concern for overall stability of the financial system.

Lack of AI Transparency: Another concern is related to lack of AI transparency. AI tools and devices might not act in a transparent manner, while assessing digital footprints of people and entities. Credit rating of individuals, firms, and governments can suffer if the entire process involves AI dependence without human oversight.

Unfair Targeting and Discrimination: Overall AI poses severe threat to people because of their individual profiling related to different types of associations and inclinations- social, economic, political, financial and digital. "Social scoring" has emerged as a grave concern from unethical AI usage. Individuals and organizations can be unfairly targeted and discriminated based on tracking their digital footprint via AI deployment.

Overcoming the AI Challenges in Digital Transactions

The AI usage in the financial sector throws grand opportunities, as well as great challenges (Patel & Walker, 2020). Keeping in view the AI challenges to the humanity, the process of framing regulatory and ethical norms has started taking place. In the year 2021, the AI Act was framed by the European Commission to regulate the use of AI worldwide. It outlaws AI that poses unacceptable risks, like social scoring, and requires registration and "Declaration of Conformity" for getting permission for development. In addition, the European Union's "The AI Liability Directive," intends to regulate AI algorithms and shifts the burden of proof from the user to the developer firm, i.e. in the event of damage, the firm will be required to demonstrate that its AI systems did not cause harm rather than the user having to do so.

The already EU enacted Data Governance Act, is about the processes to facilitate data-sharing. Moreover, the Data Act under consideration, covers fair access and usage of data with control, whereas, the enacted Digital Markets Act, covers competition and cloud players related to AI development. Meanwhile, the 2018 General Data Protection Regulation, seeks to protect the privacy of personal data and its regulated usage by AI players (Howey, 2023). Above Acts and regulations are definitely encouraging signs of imminent steps taken towards regulating uncontrolled AI usage so as to ensure its ethical applications related to human life. Following possible and urgent mechanism should be put in place to overcome the AI challenges in digital transactions, such as:

Human Oversight: Human oversight in the development process of AI systems is highly crucial for ethical and responsible use of artificial intelligence. The training data, the machine learning systems, the development of AI algos must go through human oversight so that unregulated use of AI can be checked. India has robust regulatory bodies working in the financial system. They can take initiative to implement human oversight in the development and application of AI systems in financial and digital space along with the general human life.

Responsible AI Tools: Development of responsible AI tools is a topmost priority at the moment. These tools must have inbuilt ethical and responsible AI algorithms embedded into the AI systems. For this to happen however, international forums and governments must have consensus on this crucial issue. Indian government can nudge the domestic industries to develop and use responsible AI tools only in the general and financial space. India is also a formidable global player in fintech as well as international relations (Pathak, 2023). Here, India can a play a major role in shaping up global policy towards responsible AI systems development.

Increasing AI Transparency: Responsible and transparent technology development, innovation, and transition in socio-technical systems are crucial for sustainable social entrepreneurship development (Abdelli et al., 2023). AI is invading rapidly into many spheres of human life, economy and business. To prevent misuse of AI, hence, transparent AI deployment is essential. India's digital and fintech space is

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already grappling with regulatory concerns, which indicates more than ever necessity of greater transparency in the AI space.

Ethical Dimension in Financial Fraud Prevention: AI is crucial in checking financial frauds as already discussed. But this should not lead to abrupt deployment of AI for monitoring each and every type of financial and digital transaction. In the name of prevention of financial and digital fraud, common people should not be harassed, essential transactions should be blocked and payments should not be unduly delayed. Ethical considerations must be carefully looked into in AI-powered financial crime control (Shukla, 2023). The Indian government should work with NITI Aayog, Enforcement Directorate and RBI for framing suitable policy towards this.

Regular Monitoring and Evaluation: Regular monitoring and auditing should be put in place for AI systems and AI development processes. AI assessed financial and other general uses should go through regular monitoring and evaluation through an empowered committee. Indian government should build the institutional framework required to ensure regular monitoring and audit of AI works in the country, particularly in the digital finance space.

Building Ethical and Regulatory Frameworks: Development of ethically responsible AI tools should be enforced through laws and regulations both international and domestic. Ethical and regulatory framework development can be taken up under the WTO-TRIPS mechanism as well. Ways can be looked into how WTO and international institutional and legal forums can be sensitized for effective regulations of AI. India is already founder member in many such forums, and keeping in mind the wider repercussions of digital transactions in the country, India can proactively work towards building ethical and regulatory frameworks domestically as well as in international forums like G20 and WTO.

Conclusion

Increasing use of Artificial Intelligence (AI) is being seen for facilitating all sorts of e-commerce and digital transactions in India and across the world. This throws immense regulatory and ethical issues towards management of AI especially in digital payments and transactions. Hence, the requirement for a beneficial, ethical and regulated AI system in India and across the world is felt more than ever. India's revolution in fintech and digital payments space is crucial for the colossal growth of the country. However, this should not lead to unethical and unregulated deployment of AI systems, which can lead to immense quantum of moral hazards in the country. Development of ethically responsible AI tools should be enforced through laws and regulations both international and domestic. Ethical and regulatory framework development can be taken up under the WTO-TRIPS mechanism, as well as through India's leadership position in the international forum such as G20. This will not only ensure healthy growth of digital finance in the country, but also lead towards responsible usage of AI in the overall transformation of the economy into a developed nation.

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