

Manuscript ID:
TIJCMBLIR-2026-030129

Volume: 3

Issue: 1

Month: February

Year: 2026

E-ISSN: 3065-9191

Submitted: 20 Jan 2026

Revised: 25 Jan 2026

Accepted: 15 Feb 2026

Published: 28 Feb 2026

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DOI: [10.5281/zenodo.19231673](https://doi.org/10.5281/zenodo.19231673)

DOI Link:
<https://doi.org/10.5281/zenodo.19231673>



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A Study on the Impact of Technology and Automation in Direct Tax Compliance

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²Research Guide

Abstract

Direct tax compliance under the Income-tax Act of 1961 has undergone a considerable alteration due to India's swift digital transformation of tax administration. Using primary data gathered from 80 tax professionals in Mumbai, this study investigates how automation and technology affect productivity, accuracy, task management, and professional flexibility. The e-filing site, AIS/TIS, reconciliation tools, and AI-based systems are examples of digital platforms that have replaced manual approaches in compliance processes with integrated digital frameworks.

According to the results, automation tools are widely used, and respondents reported significant time savings, fewer mistakes, better compliance accuracy, and more productivity. Professionals may now manage heavier workloads and concentrate more on strategic and advisory tasks thanks to automation.

Digital technologies are widely accepted, as evidenced by statistical analysis that finds no discernible differences in adoption or time saved across expertise levels. Software expenses and a partial dependence on manual procedures are still problems, though. The study's overall findings indicate that technology has improved the efficiency and transparency of direct tax compliance while highlighting the necessity of accessible tools, ongoing training, and supportive legislative measures for long-term digital growth.

Keywords – Direct Tax Compliance, Tax Automation, Tax Technology, Tax Professional, Tax Administration

Introduction

Background of Direct Tax

A direct tax is a fee that is levied against people or organizations and paid to the government directly. A direct tax cannot be transferred to another individual. In India, income tax, corporation tax, property tax, and securities transaction tax are the main direct taxes. Individuals, Hindu Undivided Families (HUFs), businesses, cooperative societies, trusts, companies, and artificial juridical persons are all subject to income tax under the Income-tax Act of 1961. Taxability is based on residential status, which includes resident and ordinarily resident, resident but not ordinarily resident, and non-resident. While non-residents are only taxed on income earned or received in India, citizens are taxed on their whole income. Companies that are incorporated in India or if their control and management are wholly situated in India are explicitly subject to corporation tax, which is likewise governed by the same Act and treats them as residents; while non-resident companies are taxed on Indian-sourced income subject to tax treaties. Contrarily, property tax is a local levy levied by municipal authorities on land and structures based on area-based or annual ratable value systems, with some properties excluded. In order to maintain administrative effectiveness and transparency, Securities Transaction Tax (STT) is also levied on listed securities transactions carried out on recognized stock exchanges and is collected at the time of trade.

Income Tax Act, 1961

The Act establishes extensive guidelines for the collection, administration, and levying of income taxes. Important terminology used throughout the Act are clarified by the meaning and definition provisions that come first, while terms that are not specifically defined are interpreted in accordance with general legal principles. The levying provisions address the imposition of taxes, including cess, surcharge, and relevant rates. In order to ensure accurate taxable income determination, the machinery provisions specify how income, expenses, and valuation are calculated. The assessment laws give tax authorities the authority to evaluate income and find any money that might have eluded assessment. Additionally, the Act includes punitive provisions that provide for prosecution in cases of non-compliance and impose penalties.

How to Cite this Article:

Sreekumar, A., & Patil, S. (2026). *A Study on the Impact of Technology and Automation in Direct Tax Compliance*. *The International Journal of Commerce Management and Business Law in International Research*, 3(1), 146–151. <https://doi.org/10.5281/zenodo.19231673>

Compliance obligations like submitting returns, answering notices, and adhering to established procedures are outlined in the procedural provisions. Additionally, the exemption and deduction laws outline the types of income that are tax-exempt and provide deductions in order to promote social welfare, investment, and savings. The procedures for recovering unpaid taxes, such as property attachment and adjustments against refunds, are described in detail in the recovery provisions. Taxpayers can also contest orders before appellate authorities and courts thanks to the appeal and revision provisions. Finally, for the Act to be implemented effectively, the administrative provisions specify the authority, responsibility, and operations of tax authorities.

Direct Tax Compliance

Direct tax compliance refers to meeting legal requirements for tax calculation, reporting, and payment. Direct tax compliance is the fulfilment of all statutory responsibilities related to the computation, reporting, and payment of taxes imposed directly on income and profits. In India, these requirements are principally governed by the Income Tax Act of 1961, which is managed by the Income Tax Department. Individuals and corporations must accurately calculate their taxable income, file income tax forms by the deadlines, and pay taxes on time, including advance tax and self-assessment tax. It also entails properly disclosing income from all sources and legitimately claiming deductions and credits supported by legal paperwork.

Tax withholding and documentation play a crucial role in direct tax compliance. Employers and specified payers must deduct tax at source (TDS) from payments such as salary, interest, rent, and professional fees and send the deducted amount to the government within certain time frames. Direct tax compliance includes auditing, dispute resolution, company requirements, and global reporting standards. Tax authorities may analyse returns through assessments or audits, and taxpayers have the ability to seek relief through appeal channels in the event of a dispute. Businesses must comply with corporate tax statutes, transfer pricing controls, and audit procedures, while multinational corporations must follow both domestic laws and international tax treaties.

Additionally, global frameworks such as the Foreign Account Tax Compliance Act (FATCA) and the Common Reporting Standard (CRS) require financial institutions to do due diligence and report cross-border financial information, thereby encouraging transparency and combatting tax evasion worldwide.

Technology and Automation Tools in Tax Compliance

Technology has greatly improved the efficiency, transparency, and accuracy of tax compliance in India. The Income Tax e-Filing Portal is the principal digital portal for filing income tax returns, audit reports, and other statutory paperwork. It also allows for electronic verification via Aadhaar

OTP, digital signature certificates (DSC), and net banking, which simplifies the compliance process and reduces physical interactions with tax officials.

Data integration tools like the Annual Information Statement (AIS) and the Taxpayer Information Summary (TIS) combine financial transaction data from banks, financial institutions, and other reporting businesses. Similarly, the TRACES Portal makes TDS and TCS compliance easier by allowing users to file returns, correct statements, and verify tax credits.

Form 26AS reconciliation solutions help to automate the matching of TDS, TCS, and advance tax payments to accounting records, enhancing accuracy and assuring accurate credit claims. Advanced technological solutions now include artificial intelligence-based litigation and compliance management tools that help professionals with legal research, notice response authoring, case analysis, and risk profiling. In terms of international compliance, technology-driven FATCA and CRS reporting tools automate due diligence, validate data, detect errors, and generate standardized XML reports for regulatory submission, ensuring compliance with global information-sharing frameworks and lowering the risk of noncompliance.

Research Methodology

1. Statement of the Problem

Technological advancement has significantly transformed direct tax administration and compliance. Digital platforms such as e-filing systems, AIS/TIS, pre-filled returns, and faceless assessments aim to improve efficiency, reduce errors, and enhance transparency. However, limited empirical evidence exists on their actual impact on taxpayer behaviour, compliance accuracy, and administrative efficiency. This study examines how technology and automation influence direct tax compliance, particularly in terms of adoption, time efficiency, accuracy, and professional challenges.

2. Scope of the Study

The study focuses on the impact of automation on direct tax compliance in India. It covers tools such as the Income Tax e-filing portal, AIS/TIS, digital verification, and automated systems used by professionals. The research includes tax professionals, individual taxpayers, and SMEs. It evaluates adoption levels, efficiency, accuracy, transparency, and behavioural changes. The study is restricted to direct taxes and excludes GST and other indirect taxes.

3. Objectives of the Study

- i. To assess the adoption of tax technology among professionals.
- ii. To examine the impact of automation on time efficiency.
- iii. To analyse its effect on accuracy and error reduction.
- iv. To identify benefits and challenges associated with automation.

4. Significance of the Study

Tax compliance is complex due to frequent amendments and regulatory requirements. Automation supports professionals in managing compliance more efficiently. This study highlights the practical benefits, adoption trends, and challenges associated with tax technology in direct tax compliance.

5. Limitations of the Study

- i. Convenience sampling may not represent the entire population.
- ii. The sample size (80 respondents) is limited.
- iii. Responses may contain reporting bias.

6. Type of Study

This is a descriptive, quantitative, survey-based study using both primary and secondary data. A structured questionnaire was used to collect responses.

7. Data Collection

Primary data was collected through a Google Forms questionnaire from 80 tax professionals based in Mumbai with varying experience levels. Secondary data was obtained from journals, research papers, and relevant publications.

8. Questionnaire Design

The questionnaire consists of Section I – Demographic details (age, gender, experience, employer).

Section II – Impact of automation on efficiency, accuracy, employer attitude, and comparison with manual processes.

9. Hypotheses

- | | |
|---|---|
| Hypothesis | 1 |
| H ₀ : No significant difference exists in technology adoption between less and more experienced professionals. | |
| H ₁ : A significant difference exists in technology adoption between experience groups. | |
| Hypothesis | 2 |
| H ₀ : No significant difference exists in time saved due to automation across experience groups. | |
| H ₁ : A significant difference exists in time saved due to automation across experience groups. | |

Review of Literature

Several studies have examined the growing role of technology and automation in transforming tax administration and compliance in India.

Roopa P.C. (2015) analysed the role of technology in modern tax administration and concluded that automation has significantly improved efficiency, accuracy, and transparency. The study highlighted that e-filing systems and automated return processing have reduced manual intervention, minimized errors, and expedited handling of large volumes of tax data.

Simran Rathore (2023) investigated the impact of e-filing on tax compliance among Indian enterprises and individuals. The findings indicated that taxpayers adopting e-filing systems demonstrated higher compliance levels compared to non-adopters, suggesting a positive relationship between digital platforms and voluntary compliance.

Dr. Anjali Agrawal & Ujjwal Soni (2025) examined the impact of digitalisation on tax compliance in India. The study concluded that digital systems have

reduced manual errors, curtailed tax evasion, and improved taxpayer participation. However, challenges such as cybersecurity risks, digital literacy gaps, and infrastructural limitations continue to affect full-scale adoption.

Overall, the literature indicates a strong positive relationship between technological adoption and improved tax compliance. While digitalisation and AI enhance efficiency, accuracy, and transparency, successful implementation depends on addressing infrastructural, educational, and cybersecurity challenges.

Data Interpretation, Analysis and Presentation

The demographics of the respondents show a reasonably balanced gender distribution, with 56.25% male and 43.75% female participants. However, there is a 12.5 percentage point difference, indicating a somewhat larger male presence in the sample. The age distribution is highly biased toward younger professionals, with 47.5% under 25 and 33.75% between 25 and 34. Over 81% of respondents are under the age of 35, indicating that the study is mostly on the perceptions of young tax professionals. This is further corroborated by experience data, which show that 47.5% have 0-2 years of experience and 25% have 3-5 years. Overall, 72.5% of respondents have five years or less of experience, indicating that the data primarily reflect junior and early-career professionals.

In terms of organizational background, 46.25% of respondents work in consulting firms (including the Big 4), whereas 37.5% work in Chartered Accountancy firms. Professional advising firms account for more than 83% of the sample, indicating a substantial representation of client-facing tax specialists. Corporate tax departments, independent practitioners, and others make up a relatively modest fraction. Furthermore, 76.25% of respondents handle 26 or more clients each year, indicating a high-volume workload and extensive exposure to compliance procedures. The use of technology in direct tax compliance is very high. Only 2.5% reported not utilizing any technology-based tools, whereas 51.25% use them occasionally and 46.25% use them frequently. Organizational support is similarly robust, with 97.5% indicating moderate or strong support for automation technologies.

Confidence levels mirror this trend: 50% are very confident and 47.5% are somewhat confident in using tax automation tools, indicating widespread digital comfort. Training data shows that 76.25% received formal or informal training, while 21.25% are self-taught, suggesting that structured exposure has contributed to higher confidence and smoother adoption.

Technology integration into daily compliance work is highly prevalent, with 91.25% reporting that automation is mostly or fully integrated into their workflows. The impact of automation on time efficiency is overwhelmingly positive. Nearly all respondents (97.5%) reported that automation saves time in tax return preparation, and 98.75% stated that

it reduces the overall time required to complete filings. Similarly, 98.75% believe manual processes are more time-consuming than automated systems, reinforcing the strong time-saving advantage of technology.

Automation has also significantly improved productivity and workload management. About 97.5% reported being able to handle more work due to automation, with 57.5% stating they can handle “a lot more” work. Furthermore, 100% of respondents acknowledged that automation reduces workload either to some extent or significantly. The shift from routine compliance to advisory functions is also evident, as 97.5% indicated that automation has enabled them to focus more on value-added or advisory tasks. This reflects a transformation in the role of tax professionals from data processing toward analytical and strategic responsibilities.

In terms of accuracy and compliance quality, automation demonstrates strong positive effects. Nearly all respondents (97.5%) reported that automation reduces errors, either greatly or somewhat. A similar majority observed fewer notices from tax authorities after adopting automation, indicating improved compliance precision and reduced discrepancies. Additionally, 98.75% rely on automation often or always for cross-checking and validation, highlighting strong trust in digital systems. When comparing manual and automated processes, 97.5% believe manual methods are less accurate, reinforcing the perception that automation enhances reliability and consistency.

Automation also supports regulatory compliance, with 92.5% stating that it helps them comply with updated tax rules most of the time or always. This suggests that digital tools assist professionals in staying aligned with frequent

amendments and regulatory changes. Adaptability to new tools is generally smooth, as 98.75% find learning new tax software manageable or very easy, indicating user-friendly system design and effective training support.

Despite widespread benefits, certain limitations remain. Around 41.25% report that many compliance areas still require manual intervention, and 52.5% indicate that a few areas continue to need manual review. This shows that although automation is extensive, complete digitization has not yet been achieved. Moreover, cost emerges as a significant barrier to adoption. Approximately 90% feel that software cost limits their use either somewhat or significantly, highlighting affordability as a key constraint, particularly for smaller firms and professionals.

Overall, the analysis clearly demonstrates that technology and automation have substantially enhanced speed, accuracy, compliance quality, productivity, and workload management in direct tax compliance. Professionals report improved efficiency, reduced errors, fewer departmental notices, and greater capacity to focus on advisory services. However, affordability concerns and the persistence of some manual processes indicate that while digital transformation is well advanced, further improvements in accessibility and cost-effectiveness are necessary to maximize adoption and benefits.

Hypothesis Testing 1

H₀ : There is no significant difference in the adoption of tax technology between less experienced and more experienced tax professionals.

H₁ : There is a significant difference in the adoption of tax technology between less experienced and more experienced tax professionals.

t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2
Mean	1.596491	1.545455
Variance	0.459273	0.25974
Observations	57	22
Hypothesized Mean Difference	0	
Df	51	
t Stat	0.362119	
P(T<=t) one-tail	0.35938	
t Critical one-tail	1.675285	
P(T<=t) two-tail	0.718759	
t Critical two-tail	2.007584	

Interpretation

The hypothesis was used to determine if there is a significant difference in adoption of tax technology between less experienced and more experienced tax professionals. The t-Test result shows a p value of 0.718759 which is greater than 0.05. Hence, the null hypothesis is **accepted**. There is no significant difference in the adoption of tax

technology between less experienced and more experienced tax professionals.

Hypothesis Testing 2

H₀: There is no significant difference in the time saved due to automation across different experience groups.

H₁: There is a significant difference in the time saved due to automation across different experience groups.

Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Column 1	57	91	1.596491	0.459273		
Column 2	34	51	1.5	0.257576		
Column 3	27	37	1.37037	0.242165		
Column 4	10	15	1.5	0.277778		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.953155	3	0.317718	0.915879	0.435399	2.677699
Within Groups	43.01559	124	0.3469			
Total	43.96875	127				

Interpretation

The hypothesis was used to determine if there is a significant difference in time saved due to technology across different expertise groups. The ANOVA single factor test result shows a p value of 0.435399 which is greater than 0.05. Hence, the null hypothesis is **accepted**. There is no significant difference in the time saved due to automation across different experience groups.

Findings, Suggestions and Conclusion

Findings

The study reveals that the majority of respondents were below 40 years of age, indicating strong participation from younger, technology-oriented tax professionals. Both male and female practitioners were represented, ensuring diversity and balanced perspectives. A significant proportion of respondents reported regular use of tax automation tools, confirming a clear transition from manual processes to digital systems and supporting the rejection of the null hypothesis regarding low adoption. Automation was widely perceived to reduce errors and improve compliance accuracy, with manual processes considered less reliable. Respondents also reported reduced workload due to the automation of repetitive and time-consuming tasks, enabling better deadline management and the ability to handle larger volumes of work. Additionally, technology has facilitated a shift toward advisory and value-added functions, transforming the professional role of tax practitioners. Most participants found the learning curve manageable, indicating user-friendly systems and effective integration. Tax tools are predominantly used for data validation and cross-checking, reinforcing their importance in enhancing accuracy. However, despite the widespread benefits, software cost remains a moderate barrier affecting broader adoption.

Suggestions

To strengthen the future of tax practice, firms and regulators should prioritize wider and smarter adoption of affordable tax technology through tiered pricing, subscription models, and bundled training support. Continuous professional education, peer learning, and certification programs are essential

to ensure practitioners fully utilize advanced features such as workflow automation, predictive analytics, and reporting dashboards rather than limiting usage to basic data validation. As automation reduces routine compliance work, practitioners should increasingly focus on higher-value advisory services, tax planning, and strategic consulting, supported by scalable cloud-based systems that manage growing workloads efficiently. Senior professionals should receive targeted training to reduce resistance and build digital confidence across all levels of the firm, while organizations foster a culture that encourages innovation and rewards effective use of technology. Collaboration between practitioners, software developers, professional bodies, and regulators can drive improvements in user interface design, system integration, and automation capabilities. Finally, policy advocacy supporting digital compliance frameworks and updated e-filing infrastructure can promote broader adoption—especially in tier 2 and tier 3 cities—ensuring long-term efficiency, accuracy, and sustainable growth in the tax ecosystem.

Conclusion

The study comes to the conclusion that automation and technology have a profound and revolutionary effect on direct tax compliance in India. Automation continuously shows significant advantages in terms of time efficiency, error reduction, compliance accuracy, workload management, and decision-making assistance. The study shows that tax professionals have widely accepted and rely on automation for daily operations. However, issues with software costs and learning hurdles emphasize the need for more easily accessible tools and efficient training.

Overall, the results show that technology is not only enhancing the effectiveness and quality of tax compliance but also changing the role of tax professionals by relieving them of physical labour and allowing them to do more analytical and advisory duties. In the coming years, automation has the potential to completely overhaul tax compliance procedures with further advancements in pricing, usability, and integration.

Acknowledgment

I express my sincere gratitude to SIES (Nerul) College of Arts, Science and Commerce (Autonomous) for providing the academic environment and institutional support necessary to complete this research work titled “*A Study on the Impact of Technology and Automation in Direct Tax Compliance.*”

I am deeply indebted to my research guide, Dr. Snehal Patil, for her constant guidance, valuable suggestions, and continuous encouragement throughout the course of this study. Her insightful feedback and academic expertise greatly contributed to the successful completion of this research.

I also extend my appreciation to the faculty members of the Commerce Department for their support and constructive inputs during the research process.

My heartfelt thanks go to all the tax professionals in Mumbai who generously participated in the survey and provided valuable responses, making the primary data collection possible.

I would also like to acknowledge the resources and regulatory framework provided by the Income Tax Department under the Income-tax Act, which form the foundation of this study.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

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