



Role of technology in Accounting practices in India

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Abstract

The Indian Accounting Profession is at a turning point. The accounting profession is in a state of complete metamorphosis, driven by a combination of regulatory requirements, technology advancements, and shifting attitudes in industry. Regulatory changes, technology and industry expectations are influencing accounting practices both within micro, small and medium businesses (MSMEs) and in larger professional firms. In this dissertation, the multidimensional role of technology in transforming accounting practices in India is explored, with a focus on three frameworks for analysis: compliance pressure, cost perception, and cultural resistance.

This study is based on a mixed methods research design that combines primary data gathered from 120 individuals living in the Delhi-NCR area and secondary data obtained from regulatory reports, industry surveys, and peer-reviewed academic literature, and examines five hypotheses. These are related to regulatory compulsion as a motivator of technology adoption, the cost-utility paradox faced by MSMEs, transparency anxiety among family

businesses and the evolution of the role of the accountant from compliance filer to strategic advisor.

The results indicate that access to technology by Indian MSMEs is more driven by compliance than strategic motives. The primary reason for respondents using accounting software is to comply with Goods and Services Tax (GST) requirements, rather than for analytics and/or for operational improvements. The study reveals that there is a widespread productivity paradox: on one hand, companies are endowed with rich tools, on the other, they use them less than 30 per cent of their capacity; most businesses do not use more than 30 per cent of available software features.



The research also highlights a critical human capital shortage: a shortage of so-called 'Professional Hybrids' with both accounting domain and technical skills in data analytics, cloud architecture and application programming interfaces (APIs). The cultural aspect, such as transparency anxiety arising out of India's traditional financial practices, proved to be a major but under-studied obstacle to cloud adoption.

The dissertation enriches the academic debate by proposing a revised understanding of digital transformation, as software acquisition does not automatically constitute digital transformation and, in fact, there is a taxonomy of it. adoption depth. It ends with policy and curriculum reform suggestions that can help enable true and capability-enhancing digitalisation of the MSME accounting ecosystem in India

Chapter 1: Introduction

Business is the language of accounting. It's a living language, which like all living languages changes, being conditioned by the social, economic and technological environment in which it lives. Several factors such as the regulatory change, the scale of digital infrastructure, and globalisation, have driven that change at an unprecedented speed in India in the last 20 years. The result is a new landscape in which bookkeeping is a process during revolution.

The effect of technology in the evolving scenario of Accounting in India is the subject of the dissertation. It looks at tools that businesses use, how, how much and why?

1.1 The Historical Canvas: From Bahi khatas to Cloud

In India accounting is not only a westernized way of Industrial revolution but has existed for a long time. The first formulation of the principles of financial administration in the subcontinent dates back to Kautilya's Artha-Shastra, written around 300 BCE, which provides a comprehensive set of rules for keeping track of the state's finances, for accounting for revenues and expenditures, and for detecting the dishonesty of officials in the treasury. The amazing document showcases the financial governance that was mastered by the Indians more than 2000 years ago before the birth of the modern-day chartered accountant.

The native Mahajani system evolved as the most prevalent commercial accounting system of businessmen in subsequent ages. This was a system of double entry bookkeeping, older than the system of double entry bookkeeping in Europe, and was embedded in a system of trust, community accountability, and oral verification. The physical ledger, the Bahi-Khata, was not just a document of commerce, it was also a social document for which the reputation of the Munim-ji, the trusted bookkeeper, was a guarantee and who was responsible for the commercial memory.

Since the colonial period, the western norms of accounting have been adopted here and the Institute of

Chartered Accountants of India (ICAI) was established in 1949, giving formal recognition to professional standards; and with the computer era in the larger firms, dates back to the 1990s onwards. However, if it is on a large scale,



Until well into the early 2000s the handwritten Bahi-Khata (Manual Ledger) was used by most of the small and medium businesses as a book of record.

It is unique to previous waves of computerisation in terms of how far and how widely the current wave is going to go. With the advent of the Goods and Services Tax (GST) in 2017, the requirement of e-invoicing, the audit trail provisions under the Companies Act, and the Government's Digital India initiative, there are no room for grey areas and the adoption of digital accounting has become a need of the hour. The 'architecture of the cloud' has started to supplant the red ledger bound in cloth sometimes willingly, sometimes because of legislation.

1.2 The Technological Paradigm Shift

The use of technology in accounting can be put into three phases. The initial step, digitisation, was merely the process of changing analogue activities into digital media, with computers used like electronic typewriters, which created invoices and ledgers that previously had to be written on paper. Digitalisation was an essential integration, as processes were re-designed to operate on digital platforms, and automation of repetitive work, such as bank reconciliation, statutory form filing and inventory management. The third and ongoing phase of digital transformation involves rethinking the business model itself, and data being continuously shared and exchanged between enterprise systems, government portals and financial institutions through APIs.

In India, the accounting technology landscape is now in the throes of all three phases. A large corporate company could be using artificial intelligence to detect fraud and create predictive financial models, while a nearby micro-enterprise may be using a spreadsheet to create just one tax invoice. This simultaneity is a characteristic of the Indian digital landscape, and is one of its key policy, pedagogical and practice challenges.

The platforms that have helped allow deployments are enterprise resource planning (ERP) systems for large companies, like SAP and Oracle, as well as mid-market systems such as TallyDominant ERP9 and TallyPrime software and cloud-based software like Zoho Books, QuickBooks India, and Busy Accounting Software. The Government lately has developed its own platforms such as the GST portal, the e-Invoice portal, the Income Tax portal, etc., and itself has become part of the accounting tech ecosystem, thus the need to integrate the platforms.

1.3 The MSME Frontier

Micro, Small and Medium Enterprises are the main pillars of Indian economy. According to the Annual

Report of the Ministry of MSME, the MSMEs sector contributes approximately 29 per cent of the Gross Domestic Product (GDP) of India and employs over 110 million population, making it the second biggest employable sector in India after agriculture. It encompasses a wide variety of activities, from artisanal workshops to retail traders, software service providers to manufacturing exporters, and is deployed in metropolises to tier-four towns.

It is an area where the technology promises and reality in business are most felt. MSMEs do not have the budget to hire a dedicated IT team and dedicate a great deal of capital for the implementation of ERP system. In the case of technology decisions, it's not a matter of a committee of IT gurus, it's about the oneman man or woman



who cares more about what's going on in his daily cash flow. This is a kind of mind which tend to think accounting software is not an investment it's a grudge item, a cost that they must take in.

This perception is not to be taken lightly. Research data indicates that software has been steadily increasing in sale to MSMEs, but the level of use of advanced features like predicting profits, analytics about customers, or banking API integration is minimal. Businesses buy high-priced platforms which can then be used as glorified invoice printers. The software is underutilised, the actual use is underutilised and the technology is underutilised, yielding a huge opportunity loss in Indian economic productivity.

1.4 Compliance vs. Strategic Choice: The Drivers of Adoption

It is essential to understand not only why Indian businesses use accounting technology, but also why they don't. Studies and practice reveal that there is a gap between compliance-driven adoption and strategic adoption.

Compliance-driven adoption: When a business implements or upgrades accounting tech to satisfy a regulatory requirement. One of the most successful models is the GST mandate – all businesses with a turnover above a threshold were required to submit their GST returns electronically, thus mandating the use of accounting software compatible with the business' GST system.

The three new rules Invoicing, Audit trail and the upcoming changes to the Invoice Management System (IMS) are all regulatory pull factors pushing businesses to be digital.

The strategic approach is when the purchase of accounting software gives a company a competitive advantage or is necessary for the company's operation. It might be a new way to make decisions based on real-time data, less manpower required due to automation, or cash flow management with predictive data. This form of adoption relates to greater use and return on investment. However, it requires a high level of digital skills, strategic thinking and willingness to embrace change management, which are not widely prevalent among Indian MSMEs.

This distinction is a key one for policy and practice. If compliance is the primary reason for adopting digital, easing the regulations may mean that there is a significant backlash on digital uptake. Adoption will be self-sustaining if it is strategically motivated. The evidence based on this research in the following chapters suggests that the compliance hypothesis plays a key role in the actual situation of adoption, with important implications for the sustainable digitalisation strategy.

1.5 The Digital Divide and the Road Ahead

While India has excelled in overall software adoption and internet connectivity, there are digital gaps also in the accounting ecosystem. These are on various dimensions, metros vs. non-metros, large enterprises vs micro enterprises, younger entrepreneurs who were schooled in digital vs older entrepreneurs who were schooled on physical ledgers, and in between the firms run by the graduates and the firms run by those who had not been formally educated to a great extent.

It's not just going about technology, but it's also about how to use technology. A business may have a Cloud Accounting solution but not be aware of how to report financials from it. An accountant might have learned to



enter data into Tally but not be able to use the Tally API or obtain audit trail logs. These capacity gaps are not correlated with gaps in access and cannot be addressed with access focused interventions.

This dissertation adds to the scholarly and policy debate by creating a precise map of these divisions, uncovering the structural causes of these divisions, and suggesting pathways that are evidence informed.

Towards a more inclusive and capability deepening prism of accounting technology adoption in India.

1.6 Scope and Significance of the Study

The study has focused on Delhi NCR region the one of the biggest commercial hubs of India and secondary data from the national level which is relevant to the study. The research population comprises of MSME proprietors, accountants in small practice firms and CA in practice firms. The period is from 2017 until the present (ie from GST implementation till today).

This research has three important implications. First, it provides a distinction between adoption rate and adoption depth which was lacking in the existing literature. Secondly, it brings to the fore aspects of technology resistance that are neglected in economic analyses, including cultural and behavioural. Thirdly, it offers actionable recommendations for education, policy, software vendors and professional bodies to enhance the quality of technological use in accounting practice in India.

1.7 Organisation of the Dissertation

This dissertation is organised into seven chapters. An introduction and contextual information are given in Chapter 1. The literature review in Chapter 2 is extensive and covers historical, regulatory, technological and human capital aspects. In Chapter 3, the research design (problem statement, research objectives, and research questions, and research hypotheses) is formulated. In chapter 4 the method of the research, data collection tools, sampling and analytical framework are discussed. The data analysis and findings are given in Chapter 5. Theoretical framework will be used in Chapter 6 to discuss and interpret the results. This chapter concludes with an overview of key findings and results and a discussion of policy implications and future research. A detailed reference lists and Appendix containing its research instrument concludes the dissertation.

Chapter 2: Review of Literature

The literature search is the starting point for original research. The present chapter reviews the research, work and rules existing in the field of accounting technology adoption in India, which will serve as inputs for present study, themed and organized multi dimensionally. The review covers the history of accounting practice, regulatory frameworks shaping digital transformation, behavioural and structural hurdles to technology uptake, the new role of AI in accounting and the human capital challenges facing the profession.



2.1 The evolution of history: Artha-Shastra to Algorithms

The Indian accounting history tells of a long legacy of accounting management that is often overlooked in the mainstream of accounting history. The accounting traditions in India have been noted by scholars like Mattessich (1995) and Lall Nigam (1986) as a parallel development and in some ways an earlier one than the Venetian double-entry accounting system attributed to Luca Pacioli in 1494.

Contemporary research is important for this historical context because of its cultural continuity. The BahiKhata system was not simply a tool for accounting, but rather a social framework of trust, oral confirmation, and confidentiality. Lall Nigam (1986) noted that the Mahajani system gave high value to confidentiality since scripts and codes used for transactions were made intelligible only to the Munim-ji and the merchant family, and the transactions were not revealed to external parties in a way that would allow them to see the financial position of the firm. As this dissertation claims, this cultural preference for opacity is relevant to understanding resistance to the cloud-based accounting system for a long time to come.

The formal process of transforming Indian accounting practice started with the formation of ICAI in 1949, aligning the Indian accounting standards with international accounting standards. The latter introduction of Indian Accounting Standards (Ind AS), based on International Financial Reporting Standards (IFRS), marked another stride towards integration with the international community. But as some scholars have mentioned, these normalisation exercises were mostly geared towards large businesses and listed companies, while the MSMEs remained largely unregulated until the advent of GST.

2.2 Regulatory Compulsion: The GST Era as an Engine of Digital Change

The opinion of the academicians on the prime movers of accounting technology adoption in India is unanimously pointing towards regulatory pressure. This has been well-explained by the longitudinal study conducted by Rajasekaran and Lalitha (2020) on the adoption of accounting software in MSMEs before and after the implementation of GST in 2017, in which the authors found that there was a statistically significant rise in the use of accounting software after the implementation of GST, with the adoption rate of the sample increasing from 34 percent to 71 percent in 18 months.

Sharma and Gupta (2021) describe the GST regime as moving from being a single tax regime to an 'API-driven fiscal surveillance architecture'. The various mechanisms that will go into effect soon, such as realtime invoice matching, automatic ITC input tax credit, and the upcoming hard-lock mechanisms for filing returns, give businesses increasingly less margin for error to make manual changes. These researchers are saying that the government has made it practically impossible for people to disobey it as well as legally.

The introduction of the audit trail requirement under the Companies (Accounts) Amendment Rules, 2021 has garnered attention from legal scholars. The need for accounting software to keep a thorough and accurate record of all transactions and changes, and ensure it cannot be altered, changes the relationship between a business and its accounting data. It may seem intuitive that entries are so frequently made for the purpose of tax liability management that their contents should be discoverable through a good audit trail; but historically, that was not the case and was a deceptive practice. According to Arora, it's a conscious decision by the government to use the technology as a tool for corporate governance rather than just for fiscal management.

Kumar and Sinha (2022) take this analysis one step further and report on the 'compliance cascade': the phenomenon whereby for each compliance requirement imposed on large enterprises by the new e-invoicing



rules, the large enterprise has to ensure their MSME suppliers and customers comply with the same rules, even if they are not subject to the same compliance requirements or are not above the mandatory threshold. This network effect has extended the 'real' scope of digital accounting beyond the legal confines of the digital accounting definition.

2.3 The MSME Experience: A Case Study on TAM (Technology Acceptance Model) and its shortcomings

According to Davis (1989), the two primary factors that affect Technology Acceptance are Perceived

Usefulness and Perceived Ease of Use, the latter being named the Technology Acceptance Model (TAM). The model has been used extensively in the Indian MSME accounting context, but some researchers have found it to be an insufficient model to explain the adoption situation in the MSME context.

Venkatesh and Morris (2000) modified the TAM model by incorporating other factors such as social influence and facilitating conditions to develop the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Malhotra and Bhardwaj (2020) found that social factors were more significant for MSMEs in India in determining the adoption of technology, as opposed to perceived usefulness among MSMEs of Delhi, as it was decisions undertaken in response to peers, competitors or large clients that were the most significant social influences. This is in line with the compliance cascade effect model proposed by Kumar and Sinha (2022) and indicates that the standard TAM model might be inadequate to explain the significance of social and regulatory pressures in India.

There has been extensive research into the cost aspect of technology adoption. In a survey of 300 MSME owners conducted by Mishra and Patel (2019) in Gujarat and Maharashtra, it was observed that cost was the top reason given by 88 per cent of the owners as to why they were not using and/or upgrading software, yet they were demanding cloud access, mobile compatibility, and other advanced features. The flip side of that is that I don't want the "best of both worlds" but I do want to pay for the "best of both worlds. It's a further symptom of my lack of understanding about software as an overhead cost versus a capital investment. The term 'price anchoring' is proposed to describe how micro entrepreneurs are comparing the price of software versus the cost of physical stationery as opposed to the opportunity cost of human effort.

2.4 The Digital Divide: Beyond Access to Capability

Initial debates on the digital divide were mainly about access—that is, about the disparity between those who could gain access to computers and to the Internet and those who could not. Recent scholarship has shifted to a more complex and layered understanding of the concept of digital inequality. Van Dijk (2005) identifies three types of divide: access divide, skills divide, and usage divide and concludes that only physical access is not enough to ensure meaningful digital inclusion.

Singh and Kaur (2021) describe a 'capability deficit' in the Indian accounting environment, including in companies that formally use accounting software. Their study of 200 companies in Delhi NCR shows that only 67% of the companies have been using the accounting software on a regular basis, less than 20% had ever generated management reports, less than 15% used the inventory optimisation features of the software and less than 10% had ever set up any API integration with banking or government portals. The authors find that the adoption statistics greatly underestimate the level of digital transformation in the industry.



Bose and Bhatt (2022) explore factors driving capability level use and conclude that the strongest factors are: formal education level, whether the software had been used in a business context before, and whether there was a dedicated accountant (rather than the proprietor handling accounts themselves). Importantly, these human capital variables proved to be far more important than firm size in explaining whether or not technology adoption leads to real capability, indicating that the individual literacy and professional exposure of employees are more important than organisational scale in explaining the relationship between technology adoption and real capability.

2.5 Artificial Intelligence, Automation and the Changing Face of Accounting

The growing number of papers on AI in accounting do not provide a single, monolithic depiction of what AI will look like in the future but rather a collection of dynamic and rapidly evolving ideas and practices that are transforming professional and business practices around the world. Appelbaum, Kogan and Vasarhelyi (2017) state that AI and robotic process automation (RPA) are not just simply an upgrade of accounting practice, but they represent a paradigm shift of how financial information is generated, verified and consumed.

In the Indian context, Kaushik and Aggarwal (2022) record the use of RPA tools in large chartered accountancy firms, noting that companies that implemented automation saw a decrease of 60 to 75 percent in manual processing time for routine compliance activities like preparing financial statements, managing inventory, and processing invoices.

Matching of bank reconciliation and GST returns. In a similar manner, the researchers document a change in the billable work mix, with routine compliance dropping and advisory/consultancy rising, in favor of the 'role transformation hypothesis', which is one of the five hypotheses examined in this dissertation.

This is yet another evolution in the use of generative AI for legal and tax research. Tools like case law analysis, identification of relevant precedents, and flagging tax exposure in complex transactions are starting to make their way into the Indian professional market, albeit with some limitations, and are being used only by the largest and most technologically advanced firms. However, Verma and Srivastava (2023) caution that if these tools are to be used effectively, they will need to be sophisticatedly prompted, the outputs verified, and professional judgment exercised when deciding their applicability in the context — skills that the current workforce is largely missing.

Additionally, there are risks linked to AI adoption in accounting that have been pointed out in the literature. Historical training data might contain biases that can be amplified in automated systems, such as credit scoring and fraud detection systems. The privacy implications of vast quantities of financial data being managed by AI systems in the cloud are quite large in India, where there is not a strong data protection framework in place. These concerns are applicable to the transparency anxiety hypothesis studied in this research.

2.6 Human Capital and Educational Reform

Skills gap in accounting education is one of the most persistent issues reported in the accounting education literature. In a global context, Datar, Garvin and Cullen (2010) reported that accounting education had historically focussed too much on memorizing the technical aspects of the subject and not enough on analytical, communicative and technological skills. This is especially true of the Indian situation.

The curriculum of the ICAI has been revised several times, and the addition of technology-based topics in the Chartered Accountancy Course is a welcome move. Yet, Mehta and Chawla (2021) suggest that the speed of curriculum changes is far behind of technological changes in practice, leaving a continuous mismatch between



the knowledge of graduates and employers' requirements. In their interactions with recruiters at CA firms, they found that all newly qualified accountants were able to clear the theoretical tests on information systems but were not found to be proficient in the tools which are widely used in the Indian practice.

In most of the Indian Universities, undergraduate commerce course still uses manual accounting methods based on journal entries and technology is seen as an ancillary component of the course. Gupta and Nair (2022) found that 78 percent of undergraduate commerce students in five colleges of the Delhi University had their personal mobile phones, but less than 25 percent said they had hands-on experience with accounting software; less than 10 percent had come across cloud accounting platforms in their studies.

The development of so-called 'professional hybrid' is increasingly the subject of discussion, with a view to accountants becoming more technically proficient in data science, programming and systems integration. NASSCOM's Future of Jobs studies have singled out accounting as one of the top five professions most likely to be automated in the medium term and, at the same time, have identified that accountants need hybrid skills – skills that are 50% human and 50% digital – to become the most needed professionals in the digital economy. If this is so, then this is a trajectory toward professional development, not replacement, and depends on successful educational reform efforts.

2.7 Cultural Factors include transparency, trust and the informal economy

Though some cultural explanations have been included in the academic literature, they have not been explored to any significant degree in the context of the Indian context of the adoption of accounting technology. But a body of educational research based on the institutional economics and socio-cultural theory has started to shed light on how cultural norms influence technological behaviour.

In their pioneering study on the economics of Indian small business, Banerjee and Duflo (2007) have reported that MSME proprietors have an extensive use of informal credit and accounting systems, and that the notion of financial privacy is not simply a tax avoidance tactic, but also a cultural attitude that emerged in pre-colonial India from the merchant tradition. In this context, the cloud is not simply a new technology, but a cultural invasion, a trail of data that persists even after the data itself is gone, and access points to the cloud's APIs that are subject to government monitoring, and audit logs.

The authors, Nair and Choudhary (2021), build on this insight by conducting a qualitative study with family-owned businesses in Rajasthan and Gujarat, and uncover the extent to which resistance to the cloud adoption relies on three transparency concerns: transparency towards the government (tax authority), transparency towards competitors (commercial intelligence), and transparency towards family members outside of the core management circle (internal governance). Such worries were seldom justified in the sense of being well founded with respect to the actual risk but were very real and felt.

This literature is important for providing context on the issue of transparency anxiety hypothesis in India and indicates that there needs to be an intervention on the trust building and institutional credibility as opposed to just skill training or cost reduction.

2.8 Gaps in the Existing Literature

The literature review indicates some important research gaps. First, most quantitative studies have used adoption rates as the main dependent variable, without differentiating between the adoption of the product at the surface level (installation and basic use) and deep level of adoption (use of advanced features). This dissertation is working directly to fill this void.



Secondly, cultural aspects of technology resistance are still little researched. In most studies, the importance of the role of culture is recognized but it is considered as being responsible for residual effects only instead of as a variable of investigation.

Third, little research has been conducted on the nature of changes in adoption within individual firms over time, especially as it relates to the changing nature of their regulatory requirements. The cross-sectional designs that are prevalent in the literature are snapshots that cannot capture the dynamic process of capability development.

Fourth, the relationship between the use of the technology by the firm and the professional identity of the accountants has not been well-studied. The policy implications for workforce and the educational reform of accountancy education depend on how accounting professionals view and react to the role shift due to technology.

This dissertation aims to fill these gaps, and uses a theoretically informed, empirically robust research approach that considers cultural, behavioural and capability factors with equal weight as the economic and regulatory factors.

CHAPTER 3: RESEARCH DESIGN

3.1 Title of the Study

Role of Technology in Accounting Practices in India: A Study of Compliance, Cost and Culture.

3.2 Research Gap

The extensive research conducted thus far provides us with numerous pieces of empirical evidence that indicates the rise of accounting software usage since the introduction of GST to MSMEs in India in 2017. However, much of this prior research fails to examine the depth and quality of this adoption. In fact, much of the prior research merely examines adoption as an on/off variable, i.e. use or non-use, without considering how much (or little) of the software has been utilized to its full capabilities.

This gap in research has a significant impact on the formulations of public policy since businesses that are using expensive accounting software merely for generating invoices are experiencing very little of the benefits that digital accounting is supposed to bring, and so the public policy implications regarding compliance-driven adoptions are very different than those relative to well-utilized, depth-driven adoptions.

Additionally, the existing literature lacks rigorous empirical studies of cultural or psychological reasons for an accountant's resistance to adopting digital accounting software, including the fear of transparency and their professional identity. As part of this dissertation, I will address each of these gaps.

3.3 Statement of the problem

Currently, both the accounting industry in India and the micro, small and medium-sized enterprises (MSMEs) it serves are at an important crossroad. The regulation of the sector is increasingly moving towards requiring businesses within it to have the ability to use some level of digital technology. The technology landscape is also evolving to give businesses more access to strong technologies at prices that are dropping rapidly; the significant economic benefits of deep digital integration are well established; however, businesses in India are very much behind the curve in relation to these opportunities. The following statements summarise the four major barriers that the research aims to address:



The Expense Barrier to Economically Modernising: Accounting technology to most micro-enterprises are still viewed primarily as an operational cost versus a strategic investment; therefore, these businesses do not invest enough in accounting technology, which results in not sufficiently utilising it.

The Munim-ji to Tech-Accountant: The accounting workforce in India has an extremely limited supply of professionals who are skilled in both traditional accounting and digital technologies; therefore, this lack of knowledge creates a bottleneck for accounting technologies to deliver significant value to businesses.

Technology Not Utilised to Its Full Potential: Many businesses who have formally adopted an accounting software system do not use it to its full capabilities. The challenge is for businesses is to not only run the software, but to run it effectively and efficiently.

The Digital Disconnect: The vast majority of Indian MSMEs are generally not keeping pace with the government's drive to accelerate the ongoing use of digital technology; the result is that many businesses are using digital technology to avoid receiving penalties and are not using digital technologies as an enhancement to their business capability.

Cultural Resistance: The historical preference for financial privacy in India's informal business sector creates specific and culturally rooted resistance to the transparency requirements of modern cloud-based accounting systems

3.4 Research Objectives

The study is guided by the following primary research objectives:

1. Investigate & analyse the compliance vs growth paradox: Analysing whether Indian organisations are adopting accounting technologies for government compliance or for business intelligence & growth purposes.
2. Diagnose the MSME digital divide: Identifying behaviour, structure & culture barriers that prevent MSMEs from fully embracing cloud accounting. This will involve looking beyond a cost analysis of cloud technology into the issues of transparency anxiety, digital literacy & attachment to traditional accounting methods.
3. Map the evolution of humanity in accounting: Assessing the evolution of accountants as being moved from data entry & compliance; toward a more strategic financial advisory role will require identifying skills gaps & making changes to curricula.
4. Assessing Readiness for AI Age: Assess how ready are Indian accounting firms, both for large practices and small in-house organisations, for the next wave of disruption brought upon by artificial intelligence/rpa.
5. Develop Taxonomy of depth of technology adoption: Develop a deeper classification of how deeply technology is integrated into an organisation's business processes / decision-making.



3.5 Research Questions

This research will investigate key questions concerning accounting and technology developments as well as how they impact small businesses in India. The following are four primary questions that will guide the investigation.

RQ1: What factors have been identified as having a direct impact on the adoption of both accounting technology and MSME's ability to make use of accounting technology by MSME's?

RQ2: How has AI and automation changed both the daily role of accountants and the way that accountants work with their clients in India?

RQ3: Does the existing accountant education system in India prepare students for working in a technology business?

RQ4: Is the implementation of modern accounting software by MSMEs resulting in improved business performance and quality of financial information for MSMEs?

RQ5: To what extent does cultural transparency anxiety prevent family businesses from adopting cloudbased accounting solutions?

3.6 Hypothesis

Five hypotheses have been formulated to structure the empirical investigation. Each hypothesis operationalises one of the theoretical dimensions identified through the literature review.

The Regulatory Push Hypothesis

H0: Technology Adoption for Accounting in India is NOT primarily based on compulsion through regulation, while the alternative suggests otherwise.

H1: Technology Acceptance Model which considers perceived usefulness & ease of use as the sole determinants of adoption however in India coercive compliance through government mandated regulations was found to be the dominant determinant of a firm adopting a new technology if substantiated then it should be concluded that if there were no regulations there would be significantly less Technology adopted to comply with and very shallow usage of that Technology as there would be no ongoing incentives to use any and all of the capability of that technology.

The Cost-Utility Hypothesis

H0: The perceived cost of accounting software does not have a strong influence on MSME owners' decisions to adopt that software.

H1: There is a negative correlation between perceived cost of accounting software and the adoption of such software. Regarding underutilization of accounting software among Indian MSMEs, this negative correlation will increase.

Microenterprises in India work on very tight profit margins, and therefore, decisions regarding capital allocation are made by MSME owners are made under conditions of considerable uncertainty.



The Digital Literacy Hypothesis

H0: Digital literacy does not substantially influence how deeply accounting software is used, among MSME business owners and their financial records/tax preparation/accounting staff.

H1: Digital literacy is a strong positive predictor of how deeply accounting software is used, independent of whether it was adopted at all.

This hypothesis differentiates between owning accounting technology versus effectively using it. This hypothesis is based on the premise that the most significant deterrent to organisations realising the benefits of new technology is not whether or not the organisation successfully acquires the new technology, but how well they successfully use their new technology to create value after the new technology has been purchased. From this hypothesis it can be argued that a business owner who has developed adequate levels of digital literacy will consistently use the full functionality of their accounting software and thereby generate more reports and will obtain greater levels of business intelligence compared to another business owner who lacks adequate levels of digital literacy, regardless of the number of formal licenses the two different business owners have purchased.

The Transparency Anxiety Hypothesis

H0: The apprehensions about Data Privacy and Financial Transparency will not have a major impact on the decision to implement a Cloud Accounting System.

H1: Concerns regarding Transparency Anxiety, which refers to an individual's apprehension regarding the potential for government intervention and data leakages, will serve as a strong deterrent to cloud accounting for Family Owned MSME's (Micro, Small, & Medium Enterprises).

Of the five hypotheses, this one is the most culturally specific. This hypothesis suggests that, even amongst businesses with sufficient financial resources and Digital Literacy, the inherent Financial Opacity that has been passed down through the history of doing business in India will act as a barrier to cloud adoption.

According to this hypothesis, the only real intervention needed is the development of Trust to demonstrate that Financial Digital Records because of Cloud Technologies cannot be exploited or abused using Institutional Constructs.

The Role Transformation Hypothesis

H0: The adoption of AI and automatic systems in accountancy has no impact on the nature and volume of revenue and tasks for accountancy professionals.

H1: Accountancy firms utilizing AI and automation will experience a shift in income from compliance based revenues (decrease) to advisory/consultative revenues (increase).

The above hypothesis expresses a significantly different viewpoint concerning the effect of accounting technology adoption on the professional transformation area. Namely, the hypothesis anticipates that the automation of repetitive compliance type tasks e.g. GST filing, bank reconciliation and payroll processing will diminish the historical income model for CA firms in India while concurrently increasing the demand for higher-level advisory-type services (e.g. acting as a virtual CFO, structuring businesses and planning financially). The



'professional hybrid', as evidenced by their ability to interpret information rather than just gather it, represents the model for professional viability in this environment.

Chapter 4: Research Methodology

4.1 Research Philosophy and Approach

In the development of this research, the researcher utilised a pragmatist philosophical framework, since it suggests that the most effective method of conducting social science research is to be based on the practical requirements of solving a specific research problem rather than on previously established ideas or ideals regarding positivism or interpretivism. As the research contains both measurable behaviours (such as software adoption rates and feature usage patterns) and qualitatively-based cultural and attitudinal dimensions that are not conducive to quantification, it is appropriate to adopt a mixed-methods approach, using both quantitative survey data to test hypotheses and qualitative semi-structured interviews to obtain context for a fuller understanding of the factors affecting the patterns of software adoption. Through this combination of methods, the research will provide the necessary statistical generalisability for the provision of policy-related findings and the necessary contextual depth to answer the question of why software adoption occurs in a particular manner.

4.2 Research Design

This study utilised both a descriptive and exploratory research design, with the descriptive component portraying the current state of technology adoption (prior empirical work in India), the current state of technology usage patterns, and perceived professional roles across the sample population, while the exploratory component explored cultural and behavioural aspects associated with technology adoption, particularly transparency anxiety and digital literacy, both of which are relatively poorly understood in an Indian context.

The study used a cross-sectional research design (i.e., data was collected at one point in time) from a representative sample stratified by different categories (e.g. age, sex, occupation, education level, etc). A longitudinal research design would create a better picture of how technology is adopted, as well as improve understanding of capability development as an ongoing process; however, due to the limitations imposed on this project by the constraints of an undergraduate dissertation (i.e., limited time, resources, and access), it was not feasible to use a longitudinal design. The limitations of the use of a cross-sectional research design and its implications for the generalisability of research findings are discussed in the limitations section of this report.

4.3 Population and Sampling

Three distinct groups located in the Delhi-NCR region constitute the target study population in this research study: MSME management who handles their own accounting either personally or through employees; and small to medium accountancy (practicing) accountants employed by small to medium-sized businesses; and chartered accountants in independent practice. The Delhi-NCR area was selected for this study as it is one of the largest areas for commercial and accounting services in India, contains a large density of MSMEs, and can be easily accessed by the researcher for purposes of obtaining responses.

The sampling technique used for this study was stratified random sampling to ensure an adequate representation of all three respondent groups as well as across all categories of firm size within the MSME sector. In total, 120 respondents participated as follows: 50 MSME proprietors; 40 practicing accountants; and 30 chartered accountants in practice. This sample size was determined through power analysis to ensure that the sample would



possess adequate statistical power for the statistical hypothesis tests proposed in this study and was consistent with sample size used in similar studies as found in the literature

In addition to the survey sample, 15 respondents were selected through purposive sampling for in-depth semi-structured interviews to provide a qualitative context to the quantitative data collected through the survey instrument. The respondents were selected purposively to provide an adequate representation of the different types of firms, variation in technology adoption, and a variety of professional backgrounds.

4.4 Data Collection Instruments

The primary tool for collecting primary data is a structured questionnaire that consists of 5 sections, one for each of the 5 hypotheses. The questionnaire is comprised of attitudinal items using the Likert scale, behavioural items using multiple-choice format, and open-ended qualitative reflection items.

The first section (A) of the questionnaire contains demographic and firm-specific information, such as: age, level of education, type of firm, annual revenue, number of employees, and type of accounting software.

Section (B) of the questionnaire investigates the drivers and barriers to the adoption of digital technologies; therefore, it is related to the regulatory push hypothesis.

The third section (C) of questionnaire contains questions about perceptions regarding cost and utility in relation to the cost-utility hypothesis

Digital literacy has been assessed using a validated composite scale (D), as well as assessed how the level of digital literacy relates to the level of software features used (i.e., self-reported usage).

Transparency anxiety (E) is addressed through items adapted from scales measuring trust-in-technology and privacy concern.

Professional accountants' perceptions of their role transformation are examined in Section F.

The questionnaire was prepared in the English language and then translated into Hindi to increase accessibility for those who are more comfortable communicating in Hindi.

To examine the clarity and timing of questions as well as assess the internal consistency of the responses, a pilot test was conducted with 15 subjects not included in the main sample prior to beginning the main data collection process. Items that had low clarity scores or high indecisiveness in response rates were addressed and revised or eliminated prior to the completion of the main data collection. The semi-structured interview guide was designed to elicit detailed narratives around technology adoption experiences, specific instances of compliance-driven versus strategic adoption, perceptions of AI's impact on the profession, and cultural attitudes toward financial transparency. Interviews were conducted in person or via call, lasting between 15 and 20 minutes, and were recorded with respondent consent for subsequent thematic analysis.

4.5 Secondary Data Sources

The secondary data sources used in this study comprised the following: (i) the Ministry of Micro, Small and

Medium Enterprises' Annual Report; (ii) regulatory notifications/circulars issued by the Central Board of Indirect Taxes and Customs; (iii) publications by the Institute of Chartered Accountants of India providing guidance on accounting standards and technology; (iv) Industry surveys conducted by the National Association



of Software Companies (NASSCOM), Deloitte, and PricewaterhouseCoopers regarding trends in the adoption of accounting technology; (v) peer-reviewed journals such as the Journal of Accounting Research, the International Journal of Accounting Information Systems, and the Indian Journal of Finance; and (vi) working papers developed by both the Reserve Bank of India and NITI Aayog.

4.6 Data Analysis Techniques

Quantitative data from the survey were analysed using the statistical procedures detailed below. For all the variables, descriptive statistics were gathered, which include frequencies, means and standard deviations. To test the hypotheses, chi-square tests were performed on the categorical variables and Pearson correlation analyses were performed on the continuous variables. To determine independent predictors of the depth of adoption, multiple regression analyses were conducted while controlling for confounding variables. To validate the composite Digital Literacy Scale and the Composite Digital Transparency Anxiety Scale, Factor Analyses were run using the same datasets. The qualitative data collected during the interviews were analysed using thematic analysis in accordance with Braun and Clarke's (2006) six-phase framework: 1) familiarisation with data, 2) initial coding, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the final report. Two independent raters assessed reliability by separately coding a random subsample of interview transcripts. The resulting inter-rater reliability (Cohen's kappa) was 0.78, suggesting that the two raters agreed.

4.7 Ethical Considerations

Throughout the entire data collection/analysis process research adhered to established research ethics principles. Each participant received details regarding: what the purpose of the research was; what was required for them to take part in the study (i.e., voluntarily), reassurance about the anonymity of their responses; and that they could choose to withdraw from the study at any time without fear of reprisal. Every participant provided informed consent prior to data collection.

Data collected through survey/interview methods was stored securely using password-protected devices. Data will be retained as long as necessary according to institutional policy before secure disposal (if applicable). No identifying information about subjects will be made available in this dissertation. The study did not involve deception, any procedures with a potential to harm participants, or the use of very vulnerable populations as subjects.

Chapter 5: Data Analysis and Findings

5.1 Respondent Profile

The final sample of 120 respondents comprised 50 MSME proprietors (41.7%), 40 practising in-house accountants (33.3%), and 30 chartered accountants in independent practice (25.0%). In terms of gender composition, 78 percent of respondents were male and 22 percent female, reflecting the prevailing gender distribution in Indian accounting and MSME sectors. The age distribution showed a concentration in the 30–50-year bracket, with 62 percent of respondents falling within this range. Educational qualifications ranged from secondary school (8%) to postgraduate and professional degree holders (34%), with the modal category being undergraduate commerce graduates (43%).



Firm size distribution among MSME respondents showed 40 percent classified as micro enterprises (turnover below INR 5 crore), 35 percent as small enterprises, and 25 percent as medium enterprises. Most respondent firms (68%) were engaged in trade and services, with the remainder in light manufacturing and mixed activities. Geographic spread within the NCR was broadly representative of the region's commercial distribution.

5.2 Accounting Software Adoption Patterns

Accounting software usage was reported by 87 percent of respondents, representing a high adoption rate consistent with the GST-era compliance requirements. The most widely used platforms were TallyPrime (52%), Busy Accounting Software (18%), Zoho Books (11%), QuickBooks India (7%), and various other or proprietary solutions (12%). The dominance of Tally in the sample reflects its established market position in the MSME sector, particularly among businesses of longer standing.

Of the 13 percent of respondents not using accounting software, all were micro-enterprise proprietors with turnovers below INR 40 lakh. This distribution is consistent with the GST registration threshold at the time of the study, suggesting that software adoption was closely correlated with formal tax registration requirements.

Software Platform	Users in Sample	% of Software Users	Primary Use Cited
TallyPrime	54	52%	GST Filing
Busy Accounting	19	18%	Invoicing
Zoho Books	11	11%	Cloud Reportin
QuickBooks India	7	7%	Advisory Us
Others / Proprietary	13	12%	Mixed

Table 5.1: Accounting Software Usage Distribution Among Survey Respondents

5.3 Testing the Regulatory Push Hypothesis

To test the regulatory push hypothesis, respondents were asked to identify the primary reason they initially adopted accounting software from a list of options: regulatory compliance requirement, recommendation from a peer or competitor, internal efficiency improvement, auditor or accountant recommendation, and other. The results were unambiguous: 71 percent of MSME proprietors identified regulatory compliance as the primary driver. When asked whether they would continue using accounting software if all digital filing requirements were eliminated, 58 percent indicated they would discontinue or downgrade their software subscription.

A chi-square test of independence between the primary adoption driver and firm size was statistically significant (chi-square = 18.74, df = 8, p = 0.016), indicating that compliance was disproportionately cited as the primary driver by micro-enterprises compared to medium-sized enterprises, where efficiency and advisory motivations were more prominent. These findings strongly support the regulatory push hypothesis: H1 is accepted for the micro-enterprise segment, while the evidence is less conclusive for medium-sized enterprises.

Interview data provided rich contextual elaboration of these findings. One proprietor of a wholesale textile business in Azadpur described the experience of software adoption as follows: 'Before GST, I did everything in my register. The accountant would come at the end of the month. Now we had to file every month, then every



quarter, then the e-invoice came. Each time the government added something new, I had to spend more on the software. I did not choose this technology. The government gave me no choice.' This narrative is typical of the compliance-as-compulsion framing that recurred across multiple interviews.

5.4 Testing the Cost-Utility Hypothesis

Respondents were presented with a hypothetical scenario in which accounting software was offered at three price points INR 3,000 per annum, INR 8,000 per annum, and INR 20,000 per annum and asked to assess the likelihood of adoption at each price point, holding features constant. The results confirmed a strong negative correlation between price and adoption likelihood (Pearson $r = -0.72$, $p < 0.001$), supporting the cost-utility hypothesis.

Strikingly, when respondents were presented with a cost-benefit calculation demonstrating that INR 8,000 annual software expenditure could save approximately INR 50,000 in accountant fees and error-related costs, only 34 percent revised their price sensitivity downward. The majority maintained their resistance to the higher price point even after being shown the ROI calculation, suggesting that cost aversion is not purely rational but carries a psychological anchoring dimension as identified in the literature.

Regression analysis revealed that cost perception was the strongest independent predictor of adoption among micro-enterprises (beta = -0.61 , $p < 0.001$), even after controlling for digital literacy, firm size, and age of proprietor. The cost-utility hypothesis is thus strongly supported for the micro-enterprise segment.

5.5 Testing the Digital Literacy Hypothesis

Digital literacy was measured using a composite scale comprising 12 items covering basic device operation, internet skills, application navigation, data interpretation, and API awareness. The scale demonstrated good internal consistency (Cronbach's alpha = 0.83) and was confirmed through factor analysis to load predominantly on a single underlying construct.

The relationship between digital literacy scores and software feature utilisation depth was tested through Pearson correlation and found to be strongly positive ($r = 0.68$, $p < 0.001$). Respondents in the highest digital literacy quartile reported using an average of 7.4 out of 15 available software feature categories, compared to an average of 1.8 feature categories among respondents in the lowest quartile. This represents a fourfold difference in utilisation depth attributable to literacy rather than to the software package purchased.

Multiple regression analysis confirmed that digital literacy was a significant independent predictor of feature utilisation depth (beta = 0.54 , $p < 0.001$) after controlling for education level, firm size, and duration of software use. The digital literacy hypothesis is strongly supported.

Interview data revealed specific dimensions of the literacy gap in practice. A CA firm partner who manages accounts for approximately 60 MSME clients noted: 'Most of my clients come to me asking why their refund is delayed. When I look at their books, I see they have been entering figures, but they have never run a single reconciliation report. They do not know what GSTR-2B matching is. The software has been doing nothing except printing their invoices. That is all they know how to do.'



5.6 Testing the Transparency Anxiety Hypothesis

Transparency anxiety was measured through a five-item scale adapted from established trust-in-technology and privacy concern instruments. Items included statements such as 'I am concerned that the government could access my financial data through cloud accounting software' and 'I prefer offline accounting systems because they give me more control over who sees my financial information.'

The mean transparency anxiety score across the sample was 3.42 out of 5, indicating a moderately high level of concern. Scores were significantly higher among micro-enterprise proprietors (mean = 3.71) than among medium enterprises (mean = 2.89) and significantly higher among family-owned firms (mean = 3.65) than among professionally managed firms (mean = 2.74). Logistic regression analysis found that transparency anxiety was a significant negative predictor of cloud accounting adoption (OR = 0.61, 95% CI: 0.48-0.77, $p < 0.001$), after controlling for cost perception and digital literacy.

These results support the transparency anxiety hypothesis, indicating that cultural fear of financial exposure constitutes an independent and statistically significant barrier to cloud adoption over and above cost and literacy concerns. Interview narratives provided vivid illustrations of this anxiety. One family business owner in Karol Bagh stated: 'My father always said, never let anyone see your full numbers. Not your bank, not your competitor, not even your partner's family. That is how we have survived three generations in this business. Now the government says put everything on the cloud. How can I trust that?'

5.7 Testing the Role Transformation Hypothesis

Among the 30 chartered accountants in the sample, respondents were asked to estimate the proportion of their revenue attributable to compliance-oriented services versus advisory services, and to compare their current revenue composition with their position five years ago.

The results revealed a clear directional shift: advisory revenue as a proportion of total revenue increased from a mean of 18 percent five years ago to 31 percent at the time of the survey, while compliance revenue declined correspondingly.

Among those firms that had explicitly invested in AI or RPA tools, the shift was more pronounced: advisory revenue averaged 44 percent of total revenue compared to 24 percent among non-adopters. An independent samples t-test confirmed this difference was statistically significant ($t = 3.17$, $df = 28$, $p = 0.004$). The role transformation hypothesis is supported, though the magnitude of the shift varies significantly with the level of technology investment.

Interview data with CA practitioners provided granular insight into the nature of this transformation. One partner at a mid-sized practice firm with offices in Noida described the shift: 'Three years ago, we had eight staff spending their entire time on GST returns, TDS filings, ROC filings. Now we have software that does the data entry and matching automatically. Four of those staff have moved to our advisory team. Our income from returns has declined because clients are paying less there is price pressure. But our income from virtual CFO services has tripled. The firm is growing, but in a different direction.'



5.8 Feature Utilisation Analysis: The Productivity Paradox

A cross-tabulation of software features available in respondent platforms against features used revealed a striking productivity paradox. Across all software users in the sample, the mean feature utilisation rate was 27 percent meaning the average respondent was using fewer than three out of ten available feature categories. This finding is remarkably consistent with Chandra's (2020) productivity paradox findings and with the 'ten percent potential' framing in this dissertation's research gap statement.

The features most used were invoicing and billing (94% of users), GST return filing (89%), and basic ledger maintenance (76%). Features least commonly used included cash flow forecasting (8%), API banking integration (6%), management reporting and dashboards (11%), inventory analytics (14%), and profit margin analysis by product line (9%). This pattern confirms that the dominant use case for accounting software among Indian MSMEs remains compliance and basic record-keeping, with the analytical and decision-support capabilities of the software almost entirely unexploited.

Invoicing and Billing	94%	Compliance
GST Return Filing	89%	Compliance
Basic Ledger & Journal Entry	76%	Basic Record
Payroll Processing	42%	Operational
Bank Reconciliation	38%	Operational
Inventory Management	29%	Operational
Profit & Loss Reports	22%	Analytical
Inventory Analytics	14%	Analytical
Management Dashboards	11%	Analytical
Cash Flow Forecasting	8%	Strategic
API Banking Integration	6%	Strategic

Table 5.2: Software Feature Utilisation Rates Among Survey Respondents



Chapter 6: Discussion And Interpretation

6.1 The Compliance-First Paradigm: Implications for Policy

One of the major findings from this research was that technology adoption in accounting of MSMEs in India is primarily driven by compliance. This is consistent with the findings of Rajasekaran & Lalitha (2020) and adds to their findings by showing that the compliance focus of technology adoption has resulted in less utilisation of features, lower levels of investment in digital literacy and less perceived value of the accounting software.

The policy implications for this finding are significant. The government's digital mandate strategy is seen as a way of enforcing accounting modernisation throughout MSMEs, and the evidence indicates that the strategy has been partially successful at achieving the compliance-driven technology adoption of businesses. However, the strategy has been unsuccessful at achieving the quality of use of the technology that could facilitate improved business management using the digital tools.

A second phase of policy intervention needs to occur that focuses on providing incentives for businesses to use the technology in more substantially, rather than just mandating businesses to adopt technology. Incentives could include tax incentives for businesses that demonstrate utilisation of the analytical and reporting features, subsidised training programs tied to specific benchmarks of software capability and public-private partnerships between software vendors and government agencies to develop user interfaces that permit low-literacy users to more easily access the advanced features of the software.

6.2 The Cost-Utility Paradox: Reframing Technology as Investment

This conclusion demonstrates that two-thirds of the respondents who were presented with an ROI (return on investment) demonstrated resistance to changing their purchase decisions, because they had essentially become accustomed to being resistant to price changes regardless of the presented ROI evidence. This conclusion is interesting from a theoretical standpoint and challenges standard economic theories explaining the behaviour of rational agents, and how they do and should react to the evidence of financial return from adopting a new way of doing business. An example of this is the results show that even when two-thirds of respondents were presented with a stated ROI, they still refused to change their previous purchasing decisions.

One theoretical approach to explain this finding is found in Kahneman and Tversky's prospect theory framework. According to this framework, the immediate cost of subscribing to software is more psychologically impactful than the future benefits associated with increased efficiency or decreased errors, which are not only uncertain, but also are delayed or partly abstract in nature.

The dynamics of anchoring and loss aversion imply that straightforward communication of potential benefits alone is not an effective marketing strategy for software vendors that are marketing to Indian microenterprises. The interview data suggest a more effective marketing strategy for software vendors is to reframe the concept of cost entirely. Vendors that have reframed the concept of cost to viewing the subscription for software as a method for meeting compliance obligations thus avoiding penalties and/or taxes resulting from non-compliant actions experience significantly different outcomes in how likely their product will be accepted into the target market. This reframing of the concept of expense appeals to the existing compliance motivation of these buyers; thus, removing the cost-utility analysis that typically evokes loss aversion.



6.3 Digital Literacy: The Binding Constraint on Technology's Potential

The evident correlation between digital literacy and degree of use of features is confirmed via many different data analysis approaches and highlights digital literacy is the limitation factor for the use of accounting technology in India's MSME sector. This finding supports the multiple levels of Van Dijk's digital divide framework as it provides an empirical basis for measuring the relationship between literacy and use.

The implication is that if the availability and affordability of software are increased but there is still a literacy gap, this will not translate into disproportionate improvements in quality of accounting or overall performance of businesses. There is a need for educational interventions at all three levels secondary and undergraduate levels (for training future business owners and accountants), professional development (for upskilling current practitioners), and enterprise (business owner needs onsite or near-site training support closely aligned with the specific platforms they use).

One potential model for providing education/training at the enterprise level is the Jan Shikshan Sansthan (JSS) vocational training program supported by the Government of India for workers in the informal economy. The potential to expand the existing JSS training network to include accounting software proficiency modules in partnership with large software companies could be a scalable low-cost solution to address the literacy challenge faced by micro-enterprise owners and their accounting staff.

6.4 Transparency Anxiety: The Cultural Dimension of the Digital Divide

I do think that the findings from this research substantiating the transparency anxiety hypothesis represent perhaps the most original contribution of this dissertation to the growing body of empirical literature. While prior scholarly theories (Banerjee & Duflo, 2007) suggest there is limited rural culture supporting accounting transparency, this research clearly demonstrates that across different rural cultures in India, there are significant differences in the measurement of TP as a variable independent of cost and literacy to predict cloud adoption within the scope of Indian MSMEs.

Furthermore, the finding that micro-enterprises and/or family-owned enterprises exhibit a higher degree of transparency anxiety compared to large and/or professionally managed enterprises clearly indicates that there exists a structural issue with respect to the family-centric informal governance structures common throughout India's traditional business community, which inherently creates legitimate confidence concerns about digital financial transparency. These lack of confidence issues surrounding digital financial transparency are legitimate; India's data protection framework is still in transition, and likewise, India's taxation authorities have built relationships with businesses that have been marked by lack of trust.

To lessen anxiety about transparency, an approach different from how to tackle literacy issues and economic barriers is required. Trust develops from institutionalised behaviour consistently over time, through transparent enforcement mechanisms based on clearly defined and enforceable data privacy laws, and through creating trust at both an individual and community level via peer-to-peer recommendations. Changing how government officials communicate about how they will use audit trails to support new businesses and help with credit application by focusing on facilitative uses of audit trail data rather than solely enforcement-driven uses of audit trail data might help shift the digital transparency narrative to have a more positive meaning.



6.5 The Professional Hybrid: Accounting's New Frontline

Based on the role transformation findings from the research, it appears that the practice of accounting within India is still evolving into a professional stage that will provide a higher level of rewards to hybrid professionals (who possess both traditional accounting domain knowledge/expertise and skillsets in the areas of data analytics, systems integration and advisory/communication) at the same time that pure compliance oriented professionals will face an increasing likelihood of obsolescence.

This global evolution of the accounting profession is not limited only to THAT, as a cultural system, but it also reflects the accountancy profession overall as a whole through many professional service sectors because of the accelerated maturity of automation technology. What is unique in India is the rapidity in which compliance-driven adoption, has created the conditions for the new focus on hybrid professionals, AND the fact that the educational system in India does not yet appear adequately responsive to the hybrid professional model.

For students currently enrolled in undergraduate commerce programs, there is a particularly important practical implication that must be noted: the additional resources committed toward achieving proficiency in digital accounts (accounting software), basic data analytics, Excel modelling, and an understanding of API integrations will likely provide a large return on investment (ROI) for students when entering the labour market during the medium term.

Furthermore, the results of this research should also provide an urgent and compelling reason for ICAI and university curriculum developers to act; the profession is evolving faster than the respective curriculum, and the gap between them continues to grow.

6.6 A Taxonomy of Adoption Depth

The first major analytical contribution of the dissertation was a taxonomy for classifying depth of accounting technology adoption, expanding on the simple 'yes/no' distinction of whether an organisation either did or did not have accounting software. This taxonomy of accounting technology adoption contained four levels of adoption maturity as shown in the following table. The taxonomy levels are derived from both the feature utilization data and interviews.

Level 1: Compliance Adoption – the company uses accounting software solely for statutory compliance i.e.

invoicing, GST, TDS. No use of analytics, reports, or advisory functionality and is the predominance of micro-enterprises in our sample.

Level 2: Operational Adoption – the company uses accounting software for both compliance & operational efficiency purposes e.g. payroll processing, bank reconciliation, and inventory management; some financial statements have been produced on a periodic basis; and some staff training has been conducted.

Level 3: Analytical Adoption — The business uses accounting technology for statutory compliance and operational efficiency, and begins to use management report, cash flow forecasting, and make data-driven decisions. The accountant is at least moderately digitally literate.

Level 4: Strategic Adoption — The organisation fully integrates accounting technology into their strategic infrastructure, utilises application program interfaces (APIs) with various banks and government portals, utilises



artificial intelligence to improve decision-making, and work with the accountant as a collaborator to achieve business results.

This taxonomy provides a more nuanced basis for policy targeting, allowing interventions to be designed not just to move businesses from non-adoption to adoption but to advance existing adopters up the capability ladder.

Chapter 7: Conclusions And Recommendations

7.1 Summary of Key Findings

This research project sought to examine and ascertain the multifaceted contributions that technology makes to the practice of accounting within India, with an emphasis on: (i) compliance pressure; (ii) cost dynamics; (iii) digital literacy; (iv) anxiety associated with cultural transparency; and (v) transformation of professional roles. The research utilized a mixed-methods approach to collect data from 120 respondents located in the National Capital Region (i.e. Delhi-NCR) and generated five main findings:

1. Adoption of accounting technologies by Indian MSMEs is motivation predominantly through regulatory compliance and not business technical requirements to improve efficiency and/or operations, this was evidenced by the fact that 93% of respondents have noted that their main reason for adopting technology is due to the fact that regulations, specifically GST regulations, have made adopting new technologies necessary to remain compliant.
2. Significant psychological barriers (such as cost) exist that prevent micro enterprises from adopting or upgrading to new technologies, and this barrier is only partially rationalized using clear evidence of a reasonable ROI (i.e. return on investment). Even when provided with evidence that supports their decision to invest in new technologies, many micro enterprise owners are still resistant to making investments because their perception of value (i.e. the quality of what they receive for their initial investment) is based on the effects of anchoring and loss aversion. One method that will help overcome this perception of value will be to present technology as a type of compliance insurance.
3. The fundamental barrier to how far you can go to use what you have in terms digital technology is digital literacy. The productivity paradox - the finding from this research that firms are in possession of sophisticated software but use less than 30% of their capabilities - is attributed to literacy shortages rather than having the software itself or an intentional choice not to use their software. In terms of factors that predict how extensively you would use your service, digital literacy is the most indicator than the size of the company, type of software or length of time the company has had their software.
4. The independent and statistically significant barrier to cloud adoption for family owned micro enterprises is the culture driven fear of being financially exposed to both the government and/or the outside world known as "transparency anxiety." This cultural barrier has been given less weight in the current literature than it deserves, and there is an immediate need for distinct institutional and communicative interventions to help overcome it.
5. Accounting professionals who have adopted Artificial Intelligence (AI) and/or automation have seen their revenue streams shift towards advisory and consultancy work. The professional hybrid model, which merges both accounting domain knowledge and digital skills, is not simply a theoretical goal but an increasingly essential professional orientation.



7.2 Policy Recommendations

For Government Policymakers

Tell businesses to implement these practices, not just provide rate of implementation. For example, offering tax credits or providing compliance help through reward categories by allowing businesses to improve their capability through advanced software; e.g., businesses can submit through data-rich returns that show they are using analytics and therefore encourage businesses to have something to work towards.

Strengthen Data Protection Frameworks: By introducing and effectively implementing a full Data Protection law, businesses will have legal certainty as to what can and cannot be done with their financial information by both governmental bodies and by third parties will alleviate part of the anxiety around Transparency.

Investing in Digital Literacy Infrastructure for MSMEs: Creating new, structured, and indirectly related skills training opportunities for users of accounting software to improve their overall digital literacy levels could be accomplished by adding accounting training modules into existing Jan Shikshan Sansthan and Pradhan Mantri Kaushal Vikas Yojana Training Programmes thus improving literacy for a large number of enterprises quickly and at minimal cost to the enterprise.

For Educational Institutions and Professional Bodies

ICAI and university commerce programs must quicken the rate of curriculum development to include practical accounting software training, data analytics and API literacy as essential core competencies, rather than as optional electives. The objective is to create graduates who are "professional hybrids" by design instead of by accident.

In addition, continuing professional development programs for current accountants must provide structured pathways for certification in digital skills, with recognition of these certifications included in fee structures and regulatory approvals.

Collaboration between commerce departments of universities and software vendors will provide students access to hands-on experience on the platforms, opportunities for certification and real-world exposure to accounting workflows that will help eliminate the gap in practical skills identified through this study.

For Software Vendors

Indian vendors should provide a leading onboarding experience that takes the user from only compliance type use cases to operate with and use features analytically, progressively. Vendors should not try to hit users with their entire feature set all at once, as many users lack the literacy to manage their first time with an overwhelming number of options.

Communities can help vendors by training reseller partners and also providing on-going support in the vernacular. A range of available language options will reduce barriers due to literacy and increase levels of transparency.



The pricing model should contain a focus on compliance, or a penalty avoidance-type of way for vendors to create their on-boarding process. When a vendor is a cost-sensitive business, and therefore a financial burden to the new purchase of software, they will respond more readily to the use of a compliance tool vs. a feature-rich model upon completion of their first time to purchase software.

7.3 Limitations of the Study

There are a few limitations in this research that would affect how to interpret its findings. Due to the use of a cross-sectional design, we only have a snapshot of capabilities development, we cannot capture how the capability development process evolves over time or what is causing the relationships we have discovered. We can analytically link the findings from our study to the geographic area in total (Delhi-NCR), but we have limited actual generalisability to other parts of India that have different business cultures, industry compositions and regulatory experiences

Researchers relied on self-reported data to determine how respondents utilized software features. Many respondents may represent themselves in a way that suggests that they are more sophisticated than they really are. Future research using direct behavioural data such as software usage logs (with the consent of the respondent) will provide us with more objective measurements of utilisation.

The sample size (n=300), for the purposes of testing the hypotheses presented, has been adequate. However, a sample of this size does not allow for performing fine-grained sub-group analyses across the combinations of any of the demographic characteristics or the characteristics of the firm. An increased sample size across the nation would provide more detailed comparisons across regions and industries.

7.4 Directions for Future Research

The restrictions and results of this investigation create numerous directions for future studies. Longitudinal research that follows the same companies for a period of three to five years will offer some awareness of the dynamics of capabilities development and whether compliance-driven adoption eventually develops into strategic adoption as companies grow more digitally mature.

Another area of research that may provide insight into the effects of local business culture and infrastructure on the quality of adoption is:

Comparative studies between various states and places within India, specifically contrasting the adoption patterns of technology-based centres such as Bangalore and Hyderabad to those of more traditional business centres; and

Reversion of differential benchmarking results of firms already on board regarding compliance versus the standards for all businesses in the National Tax Code to determine if inefficiencies continue to exist within specific geographies of Indian businesses.

Third, the construct of transparency invention warrants further development to ensure it is validated as a true psychometric tool. After additional testing and establishment of adequate regional and geographic diversity in samples, the construct's complete factorial structure and validity can be established.

Finally, an important and new research area is the impact of AI tools, especially tools designed for automated reconciliation with GST and tools designed for predictive tax planning, on productivity and revenue composition within small CA firms as these tools become accepted in the mainstream.



7.5 Concluding Remarks

India is currently undergoing a transformative phase in its history of accounting. There is currently an established regulatory framework, an established technological system and a skilled workforce (albeit in varying degrees). The only remaining gap is in bridging the gulf that separates the technology that companies own from the utilisation of that technology within their businesses.

The Bahi-Khata to Cloud transition is not just a new way of doing something; it represents the transformation of professional identity and organisational culture, as well as a change in epistemology (theory of knowledge). The transformation requires the Indian business community to accept transparency as a principle of governance, to recognise that financial information is a strategic asset rather than a secret repository, and to realise that they can work with accountants as partners to help them build a financially intelligent future.

This dissertation has documented the gaps that still exist in relation to the Bahi-Khata to Cloud transition and, by way of research-based evidence, has established some recommended policy, educational, cultural, and practice-based interventions that will help bridge the current gaps that exist. The use of the bahi-khata has served India well for many years.. Its digital successor, used with full capability and genuine strategic intent, holds the promise of serving India's 64 million MSMEs even better for the century ahead.

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