

Assimilation of Automated Accounting in Indian Big 4 firms pertinent to TOE framework

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Abstract: Purpose In the era of digitalisation cloud accounting has emerged as a changeover in the field of accounting. With its numerous benefits such as cost effectiveness, real time access, security and data privacy it has proven to be a boon in this metamorphic phase. All you need is a device and an uninterrupted internet connection. This research paper will analyse the adoption rate of cloud accounting in Indian big 4 firms with reference to all the factors of the theoretical framework of TOE (technological, organisational and environmental). Design/methodology/approach This study employs a descriptive and empirical research design for the evaluation of hypothesis. Quantitative approach was followed in this research. A structured questionnaire which used 5 point likert scale from strongly disagree to strongly agree was prepared including 25 constructs of TOE framework and was distributed through Google Forms to target population of 150 CA's of big 4 firms. Only 100 CA's responded. For this purpose snowball sampling or non probability sampling was undertaken and the primary data was collected. Further the data was analysed through IBM SPSS 31 by running regression analysis, factor analysis and correlation analysis. Findings Based on the analysis of data we conclude that TOE factors such as speed, effectiveness, accessibility, data security and privacy, organisational support, IT infrastructure, budget allocation, receptiveness, technical assistance, regulatory standards, compliance, reliability, client expectations and market competition affect the adoption of cloud accounting positively. The implications of this research suggest that big 4s are actively using cloud accounting in all their functional areas. Cloud accounting adoption has furthermore increased the efficiency and effectiveness of the business and has increased the revenue of the firms manifold times. Also it was concluded from the research that SAP HANA S/4 Cloud is majorly used in big 4 firms in audit related areas. Also further more there is a void in research regarding the attitudes and perceptions of the CA's in adoption of cloud accounting which has to be clarified. Originality The findings will be valuable for further research work to be done in this area. The findings will help various researchers, chartered accountants, accounting professionals etc to understand that big 4s are actively using cloud accounting. The data analysis reveals that the TOE factors positively affect cloud accounting adoption rate and is positively correlated. Also this research work will further contribute to the existing literature.

Keywords: - cloud accounting, big 4, adoption, TOE framework.

1. Introduction

The accounting profession has experienced a substantial shift due to the digitalisation of traditional methods. Cloud accounting is one of the most recent advancements in the field of accounting. All you need is a device and a stable internet connection and you can work remotely. It offers numerous benefits such as real time access, data security and privacy, cost effectiveness and many more. Ping and Xuefeng are the ones who proposed the concept of cloud accounting. Big 4s use hybrid cloud accounting model wherein the cloud has more than 1 cloud types (public, communal, private) to ensure mobility of data. The four big professional service providers namely Deloitte, KPMG, EY and PwC collectively known as big 4s are acting as catalyst in India by using cloud technology in the field of accounting and taxation. They majorly use cloud accounting in all their functional areas namely audit and assurance, taxation, actual services, accounting, management and legal services. Major cloud accounting platforms used by them are Oracle Cloud Financials, SAP S/4HANA Cloud, Tally deployed on cloud infrastructure and many more. TOE framework is a new



technology adoption framework which analyses all the factors taken into consideration while adopting any new technology. It consolidates all internal and external factors which is one of its major benefits. In this study we will analyse all the factors which affect the adoption of cloud accounting.

2. Objectives

1. To analyse and identify the impact of toe factors on adoption of cloud accounting in big 4 firms.
2. To identify the major challenges faced by ca's in adoption of cloud accounting.

3. Literature review

Agusiady & Avianty, (2026), in their study "Cloud-based accounting and digital transformation in Indonesian MSMEs: emerging trends and strategic implications" discuss that the adoption of CBA are based on cognitive perceptions, organisational support and technological and regulatory requirements. It also gives suggestive measures for easy transformation with respect to digitalisation in MSME sector.

Andanawarih, Mila & Novitaningrum, (2026). In their research work "Antecedents of cloud accounting adoption and its consequences on SME performance: a TOE framework approach" concluded that organizational support, its knowledge, have a positive impact on adoption of cloud accounting in MSME sector and also that the Kendal regency has to be passively act as a catalyst in the adoption of cloud accounting.

Purwanto, Hartini, Septeia & Pravitarsi, (2025) in their study "The role of cloud-based accounting in enhancing operational efficiency of MSMEs" reflect the positive impact of adoption of cloud based accounting system on operational efficiency by cutting down the time for processing, reducing cost, and increasing accuracy in financial management. Also knowledge for cloud based accounting and receptiveness of the organization are major reasons for adoption.

Foka, Asonitou, Kottara & Roussis, (2025) in their study "Adoption of cloud accounting: delving into accountants' intentions" highlighted that factors of TAM model and adoption of cloud accounting are positively correlated. Data security and privacy is the major cause of concern in non adoption of cloud accounting.

Agrawal & Jethy, (2024) An analysis of cloud-based accounting software: a literature review on features, performance, and user satisfaction showcased a compilation of previous literature work which focused at contrasting and comparing cloud based softwares on the basis of their services, features, client satisfaction and performance. This paper suggested a roadmap or a blueprint for the businesses to select the most suitable cloud accounting platform for their organization.

Sibuea et al., (2021) in their research work "Cloud accounting adoption in SMEs: an overview" added to the theoretical framework of cloud based technology by thoroughly investigating the adoption process in small and medium sized enterprises (SMEs). In this research work they have given a blueprint for the consequences and pre planning for adoption of cloud accounting. By developing this roadmap, potential barriers have been identified and rectified in the adoption process.

Komathi & Chia, (2024) this study examines the critical constructs surrounding the adoption of EC by SMEs in the service and other sectors in Malaysia. Utilizing the constructs of perceived benefits (H1), EC complexity (H2), top management attitude (H3), competitors' pressure (H4), and government support (H5), the adoption of EC by Malaysian SMEs was measured and analysed. This study is supported by the technology, organisation, and environment (TOE) framework dimension accounting.

4. Hypothesis framed

- H1- Technological factors have a positive impact on adoption of cloud based accounting in big 4s.
- H2- Organisational factors have a positive impact on adoption of cloud based accounting in big 4s.
- H3- Environmental factors have a positive impact on adoption of cloud based accounting in big 4s.

4.1. Variables

Dependent variable- adoption of cloud accounting

Independent variable- technological (speed, accessibility, reporting, alignment, effectiveness, effort to learn, technical disruptions, data security, system downtime)

Organisational(senior leadership,management communication,it infrastructure,budget allocation,training,technical assistance,experimentation, receptiveness)

Environmental(regulatory standards, compliance,competition,digital access,client expectations,reliability, it vendors)

5. Research methodology

This study employs a descriptive and empirical research design for the evaluation of hypothesis.quantitative approach was followed in this research.a structured questionnaire which used 5 point likert scale from strongly disagree to strongly agree was prepared including 25 construct of toe framework and was distributed through google forms to target population of 150ca's of big 4 firms. Only 100 ca's responded.for this purpose snowball sampling or non probability sampling was undertaken and the primary data was collected.further the data was analysed through ibm spss 31 by running regression analysis , factor analysis and correlation analysis.

6. Data analysis

The questionnaire was sent to 150 accounting professionals working in big 4 firms through google forms in delhi ncr region and below is the demographic profile of the chartered accountants.

Table 1- age

AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-35 years	4	4.0	4.0	4.0
	25-35 years	46	46.0	46.0	50.0
	35-45	18	18.0	18.0	68.0
	45 and abouve	16	16.0	16.0	84.0
	Below 25 years	16	16.0	16.0	100.0
	Total	100	100.0	100.0	

Source- IBM spss31

Out of the 46 ca's age is between 25-35 years, 18 ca's age is between 35-45 years , 16 ca's each are above 45 years and below 25 years and 4 ca's age is between 25-35 years.

Table 2- gender

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	36	36.0	36.0	36.0
	Male	64	64.0	64.0	100.0
	Total	100	100.0	100.0	

Souce-IBM spss31

Out of 100 36 ca's are female and 64 ca's are male.

Table3- years of experience as chartered accountants

EXPERIENCE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2–5 years	30	30.0	30.0	30.0
	6–10 years	45	45.0	45.0	75.0
	More than 10 years	25	25.0	25.0	100.0
	Total	100	100.0	100.0	

Source-Ibm spss31

30 ca's hold the experience of 2-5 years, 45 ca's hold the experience of 6-10 years and 25 ca's hold the experience of more than 10 years.

Table 4- role of chartered accountants

ROLE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Article / Junior Associate	9	9.0	9.0	9.0
	Associate / Senior Associate	31	31.0	31.0	40.0
	Manager	32	32.0	32.0	72.0
	Partner / Director	9	9.0	9.0	81.0
	Senior Manager	19	19.0	19.0	100.0
	Total	100	100.0	100.0	

Source-Ibm spss31

19 ca's are holding senior manager position, 9 ca's are partners or directors, 32 ca's are holding managerial position, 31 ca's are senior associates and 9 are junior associates.

Table 5-Functional area

FUNCTIONAL AREA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Audit-related activities	56	56.0	56.0	56.0
	Audit-related Activities	3	3.0	3.0	59.0
	Data reporting and analytics	7	7.0	7.0	66.0
	Financial accounting and reporting	31	31.0	31.0	97.0
	Taxation and statutory compliance	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Source-Ibm spss 31

Majorly cloud accounting is used in audit related activities and then financial accounting and reporting.

Table 6- Status

CURRENTSTATUS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Actively in use	63	63.0	63.0	63.0
	Not in use	14	14.0	14.0	77.0
	Under evaluation / planned for future adoption	23	23.0	23.0	100.0
	Total	100	100.0	100.0	

Source-Ibm spss31

Cloud accounting is actively in use in big 4s and others are planning for future adoption.

Correlation analysis is done to measure the strength between all toe factors.all the three factors show high correlation which is acceptable for further analysis none of them shows any negative correlation.

Correlations

		UTILITY	TECH
UTILITY	Pearson Correlation	1	.371***
	Sig. (2-tailed)		<.001
	N	100	100
TECH	Pearson Correlation	.371***	1
	Sig. (2-tailed)	<.001	
	N	100	100

***. Correlation at 0.001 (2-tailed)

Source-Ibm spss31

Inference- utility and technological factors show a moderate positive correlation of $r=0.371$ at $p<0.001$ level of significance.

Correlations

		UTILITY	ORG
UTILITY	Pearson Correlation	1	.565***
	Sig. (2-tailed)		<.001
	N	100	100
ORG	Pearson Correlation	.565***	1
	Sig. (2-tailed)	<.001	
	N	100	100

***. Correlation at 0.001 (2-tailed)

Source-Ibm spss31

Inference- utility and organisational factors show a moderate positive correlation of $r=0.565$ at $p<0.001$ level of significance.

Correlations

		UTILITY	ENV
UTILITY	Pearson Correlation	1	.264**
	Sig. (2-tailed)		.008
	N	100	100
ENV	Pearson Correlation	.264**	1
	Sig. (2-tailed)	.008	
	N	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

Source-Ibm spss31

Inference- utility and environmental factors show a moderate positive correlation of $r=0.264$ at $p<0.001$ level of significance.

Reliability analysis measure the internal consistency of all the independent factors. To measure the internal consistency chronbach's alpha is used.

Chronbachs alpha is 0.912 for all 8 environmental factors which is acceptable indicating all the environmental factors are consistent. Also the individual environmental factors values are ranging from 0.884 to 0.910 which is acceptable.

Chronbachs alpha is 0.931 for all 8 organisational factors which is acceptable indicating all the organisational factors are consistent. Also the individual organisational factors values are ranging from 0.914 to 0.931 which is acceptable.

Chronbachs alpha is 0.922 for all 9 technological factors which is acceptable indicating all the technological factors are consistent. Also the individual technological factors values are ranging from 0.904 to 0.921 which is acceptable.

Table7- reliability analysis for technological factors

Reliability Statistics	
Cronbach's Alpha	N of Items
.922	9

Source-1bm spss31

Table8-reliability analysis for organisational factors

Reliability Statistics	
Cronbach's Alpha	N of Items
.931	8

Source-Ibm spss31

Table9-Reliability analysis for Environmental factors

Reliability Statistics	
Cronbach's Alpha	N of Items
.912	8

Source-Ibm spss 31

Exploratory factor Analysis was done using spss31 .two test were conducted namely kmo and barlett's test.

Table 10- Kmo and Barlett's test for technological factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.742
Bartlett's Test of Sphericity	Approx. Chi-Square	798.379
	df	36
	Sig.	<.001

Source-Ibm spss 31

Technological factors-kmo was 0.742 which indicates that the sample size is sufficient and for barlett's test chi square was 798.379 with df of 36 and was significant which indicates that there is significant correlation between the variables. The communalities for all factors is more than 0.5 which indicates that each variable explained variance.

Table 11- Factor analysis for organisational factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.821
Bartlett's Test of Sphericity	Approx. Chi-Square	836.071
	df	28
	Sig.	<.001

Source-Ibm spss 31

Organisational factors- Kmo was 0.821 which indicates that the sample size is sufficient and for barlett's test chi square was 836.071 with df of 28 and was significant which indicates that there is significant correlation between the variables. The communalities for all factors is more than 0.5 which indicates that each variable explained variance.

Table 12- Factor analysis for environmental factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.503
Bartlett's Test of Sphericity	Approx. Chi-Square	1031.922
	df	28
	Sig.	<.001

Source-Ibm spss 31

Environmental factors-kmo was 0.503 which indicates that the sample size is sufficient and for barlett's test chi square was 1031.922 with df of 28 and was significant which indicates that there is significant correlation between the variables. The communalities for all factors is more than 0.5 which indicates that each variable explained variance.

Table 13- Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.926 ^a	.857	.811	.51648

a. Predictors: (Constant), E8, T1, T9, O5, O1, E1, T2, T8, O3, T3, E6, E2, O8, T7, O4, E5, T4, O7, T5, O2, T6, O6, E7, E3

Source-Ibm spss 31

Linear Regression Analysis was conducted using spss31 to check the relationship between use of cloud accounting and technological, organisational and environmental factors. The analysis shows that this model can explain 85.7% of the impact on adoption of cloud accounting. This shows a high relationship between the factors and adoption of cloud accounting. Adjusted R square is 81.1% which indicates that the model is reliable. Correlation between the variables is 0.926 which is acceptable.

Table 14- Anova Analysis**ANOVA^a**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119.554	24	4.981	18.675	<.001 ^b
	Residual	20.006	75	.267		
	Total	139.560	99			

a. Dependent Variable: UTILITY

b. Predictors: (Constant), E8, T1, T9, O5, O1, E1, T2, T8, O3, T3, E6, E2, O8, T7, O4, E5, T4, O7, T5, O2, T6, O6, E7, E3

Source-Ibm spss 31

The regression model is statistically significant with $f=18.675$ indicating that there is a significant relationship between the factors and adoption of cloud accounting. Most important regressor is technology. The magnitude of standard coefficients beta is the largest. Organisational factors are the second most important and then come the environmental factors.

7. Discussion

After the rigorous data analysis the study shows that all the hypotheses are accepted

1. Technological factors have a positive impact on adoption of cloud accounting in big 4 firms since the correlation between technological factors and adoption of cloud accounting is 0.371.
2. Organisational factors have a positive impact on adoption of cloud accounting in big 4 firms since the correlation between organisational factors and adoption of cloud accounting is 0.565
3. Environmental factors have a positive impact on adoption of cloud accounting in big 4 firms since the correlation between environmental factors and adoption of cloud accounting is 0.264
4. The regression model formulated indicates that this model includes 85.7% of the factors responsible for adoption of cloud accounting.
5. Anova analysis indicates that the model is statistically significant with $f=18.675$ indicating that the technological factors have the highest effect on adoption of cloud accounting.
6. Furthermore the factor analysis indicates that the sample size is sufficient for the research.

8. Conclusion

Based on the analysis of data we conclude that the factors such as speed, effectiveness, accessibility, data security and privacy, organisational support, IT infrastructure, budget allocation, receptiveness, technical assistance, regulatory standards, compliance, reliability, client expectations and market competition affect the adoption of cloud accounting positively.

The implications of this research suggest that big 4s are actively using cloud accounting in all their functional areas. Cloud accounting adoption has furthermore increased the efficiency and effectiveness of the business and has increased the revenue of the firms manifold times. Also it was concluded from the research that SAP/Oracle/4 cloud is majorly used in big 4 firms in audit related areas. Also further more there is a void in research regarding the attitudes and perceptions of the CA's in adoption of cloud accounting which has to be clarified.

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