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Determinants of Management Accounting Application Use in Vietnamese Telecommunications Companies: The Moderating Role of Organisational Culture

Phuong Thi Kim Tran [1], Irene Wei Kiong Ting [2,*], Thien Huu Nguyen [3] and Hanh Thi My Tran [4]

[1] Faculty of Accounting, Ton Duc Thang University, Ho Chi Minh City 70000, Vietnam; 196203002@student.tdtu.edu.vn
[2] Benchmarking Research Group, Faculty of Accounting, Ton Duc Thang University, Ho Chi Minh City 70000, Vietnam
[3] Faculty of Accounting - Finance, Dong Nai Technology University, Bien Hoa City 76100, Vietnam; nguyenhuuthien@dntu.edu.vn
[4] VNC Global Trade Co., Ltd., 136, Tran Nhan Ton, District 10, Ho Chi Minh City 70000, Vietnam; tranhanhnt88@gmail.com
* Correspondence: irene.ting@tdtu.edu.vn

Abstract: This study aims to investigate the effects of the determinants of management accounting application use in the telecommunications industry whilst considering the moderating role of organisational culture. The determinants examined in this study were company size, business strategy, accountants' qualifications, market competition and managers' awareness. Survey questionnaires were distributed to telecommunications companies in Vietnam, which resulted in a dataset of 146 respondents from 164 Vietnamese telecommunications companies and a response rate of 89%. The target respondents were directors, vice directors, managers and chief accountants. The questionnaires were distributed to each company, and the collected data were processed using Microsoft Excel and analysed for conformity using SPSS and Smart-PLS. Path analysis, specifically, structural equation modelling with partial least squares structural equation modelling, was conducted. The findings indicated that all the determinants except company size positively impacted management accounting application use. However, in the presence of organisational culture, company size did positively influence management accounting application use. Moreover, organisational culture enhanced the influence of managers' awareness on management accounting application use in the Vietnamese telecommunications companies. This research can deepen our understanding of the determinants of management accounting application use and moderating role of organisational culture in the context of the telecommunications industry. The findings can provide empirical evidence to managers of Vietnamese telecommunications companies seeking to enhance the performance of their organisation.

Keywords: management accounting; management accounting application; telecommunications company; organisational culture

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1. Introduction

The telecommunications industry of Vietnam has experienced significant growth and transformation, fuelled by the rising demand for mobile and Internet services and supportive government policies for the country's integration into the global economy.

According to the Ministry of Information and Communications (MIC), Vietnam's mobile phone usage rate has increased in recent years. The adoption of mobile phones has played a pivotal role in this upward trend and led to a surge in the mobile subscription penetration rate, which was estimated to be 75.80% in 2022, a 1.4% increase compared with the rate in 2021 [1]. This statistic implies that a significant proportion of the Vietnamese population possesses multiple mobile phone subscriptions. Furthermore, the MIC highlighted

the increasing preference for mobile devices for accessing the Internet. A considerable number of consumers are relying on their smartphones to conduct and participate in online activities, with social media and e-commerce platforms being the most popular sites [2]. The rise in mobile Internet usage showcases the profound impact of mobile technology on the daily lives of Vietnamese individuals [1].

The MIC is primarily responsible for regulating the telecommunications industry in Vietnam. As the leading regulatory authority, the MIC oversees the industry's operations and enforces relevant policies. The government implemented various measures to promote competition, encourage investment in infrastructure and drive innovation, especially the 'National Digital Transformation Program to 2025, with orientation to 2030'. Despite the government's efforts, the telecommunications industry in Vietnam is experiencing several challenges. One notable concern is the limited competition in specific segments, and another challenge is the need for infrastructure development, particularly in rural areas. Furthermore, cybersecurity issues pose a significant threat to the telecommunications industry of Vietnam.

Thus, by fostering research on the telecommunications industry and expanding firm operations, telecommunications companies can benefit citizens and contribute to the country's digital transformation.

Management accounting (MA) plays a crucial role in enhancing the performance of organisations, including telecommunications companies. MA encompasses the preparation and presentation of financial information that can assist managers in their decision making. MA applications can significantly contribute to the overall success of an organisation [3–6]. MA can provide telecommunications companies with valuable insights into their operations and enable them to identify areas for improvement. Subsequently, managers can pinpoint the causes of high operational costs, identify opportunities to reduce waste and enhance efficiency, and make improved pricing decisions to remain competitive in the constantly evolving market [7–9].

Furthermore, MA applications can help telecommunications companies track their organisational performance and evaluate their success in the form of profitability, liquidity and solvency through financial reports such as balance sheets, income statements and cash flow statements [5,10–12]. MA information, such as the key performance indicators of organisations, including customer acquisition costs, average revenue per user, churn rate and return on investment, is a basic requirement for making informed decisions for a company's growth and success [6,9,13,14]. Telecommunications companies operate in a highly regulated environment that constantly experiences technological changes, market volatility and cybersecurity threats, and MA applications can benefit such companies by providing risk assessment, risk mitigation and internal control measures to identify and manage risks effectively, such as the impact of regulatory changes on financial performance and compliance or cybersecurity threats and data breaches [5,15–17].

The extent and nature of MA applications will vary depending on the company size, business strategy, accountants' qualifications, market competition and managers' awareness. Furthermore, large companies are more likely to adopt strategic planning, performance measurement and budgeting practices than small companies [12]. Moreover, small companies rely considerably on informal and intuitive MA practices owing to their limited resources and informal decision-making process [18–20]. Different business strategies, such as cost leadership, differentiation or focus, require different types of MA information. By providing financial information and analysis, MA applications can enable managers to make decisions that align with their organisation's strategic objectives [11,21]. The professional qualifications of accounting staff are crucial to MA applications [18]. Highly qualified and trained MA staff can efficiently analyse and interpret financial data, create relevant reports and provide meaningful insights to support decision making [18,22]. Market competition can also significantly impact the use of MA applications. Businesses in competitive industries should continuously monitor and analyse their financial performance to stay ahead by conducting competitor analysis, benchmarking and strategic cost manage-

ment to identify cost-saving opportunities and optimise their pricing strategies [7,23,24]. Companies that effectively utilise MA applications to analyse competitors' data and make informed decisions can gain a competitive advantage over their rivals [24,25]. Managers' awareness of MA is another crucial factor that can impact MA application use [19,26,27]. Managers may invest in training and development programmes for their MA staff, implement modern MA tools and techniques and proactively use MA information for decision making [11,18,28–30].

Meanwhile, organisational culture, which is a multifaceted and influential aspect of an organisation, can play a pivotal role in shaping its practices and strategies. Although organisational culture was recognised as a crucial factor that can influence various dimensions of an organisation, its specific impact on MA application use in telecommunications companies has received little attention. Thus, delving into this aspect to gain a comprehensive understanding of how organisational culture can serve as a moderating variable in the relationship between other determinants and MA application use is imperative. Organisational culture refers to shared values, norms and beliefs that can collectively mould the behaviours and practices of individuals within an organisation [3,31]. Such cultural attributes can significantly influence the use of MA applications and thus serve as a moderating force that can either enhance or hinder the impact of other determinants on the implementation of MA practices [32].

For instance, organisations with a culture that highly values innovation and flexibility will be inclined to adopt MA techniques that are forward-looking and emphasise long-term performance measures [19,33]. In such a cultural environment, organisations will likely foster an atmosphere in which MA applications would be instrumental in supporting strategic initiatives, fostering innovation and facilitating long-term planning. This cultural alignment may amplify the effects of determinants such as strategic orientation, leadership style and technological infrastructure on the adoption and effectiveness of MA applications. Conversely, organisations with a culture that prioritises stability and control may tend to rely on conventional MA methods that emphasise past performance measurements. In such organisations, focus may lean towards maintaining stability, ensuring compliance and preserving the status quo [15]. Therefore, the moderating effect of organisational culture could mitigate or counteract the influence of other determinants, such as external competitive pressure or industry-specific characteristics, on MA application use [33–35].

Overall, this study intends to achieve two research objectives. Firstly, this study aims to identify and examine the key factors that can drive the adoption of MA practices and applications in organisations, namely, business strategy, market competition, company size, accountants' qualifications and managers' awareness. Secondly, this study attempts to explore the moderating effect of organisational culture on the relationship between the key factors and MA application use to determine whether organisational culture can enhance or hinder the successful use of MA applications.

This study makes significant contributions to the literature. Firstly, despite the acknowledged importance of MA, comprehensive understanding of the factors that can influence its successful application in telecommunications companies is lacking [9,36,37]. Several factors can affect MA application use, including external determinants such as economic conditions, regulatory requirements and competitive rivals as well as internal determinants such as managers and accounting staff [18,38]. This study combines the key internal and external factors that may affect the implementation of MA techniques. Furthermore, this study can provide managers with valuable insights to optimise their decision-making process by identifying the factors that can influence the successful use of MA applications. This study represents an initial endeavour to investigate the role of organisational culture in moderating the relationship between crucial factors and MA application use. Our study seeks to provide a comprehensive perspective on the dynamic interaction between MA practices and organisational performance. Ultimately, the insights from this research may furnish Vietnamese telecommunications companies with practical guidance on how to harness the potential of MA applications to optimise their performance.

The subsequent sections of this paper are structured as follows: Section 2 provides a comprehensive overview of prior research and formulates hypotheses that can be empirically tested, Section 3 presents the methods for conducting the investigation, Section 4 reports the empirical findings of the investigation and Section 5 concludes the study by discussing the findings and their implications, acknowledging the research limitations and identifying potential avenues for future research.

2. Literature Review

2.1. Overview of MA Applications in the Telecommunications Industry

The telecommunications industry is a dynamic and highly competitive sector characterised by rapid technological advancements, evolving consumer demands and complex regulatory frameworks [39,40]. Within this challenging landscape, the strategic deployment of MA applications has become vital for telecommunications companies. MA practices encompass a wide array of tools, techniques and strategies that can assist organisations in optimising their financial performance, cost structure and decision-making process. Such applications cover areas such as budgeting, forecasting, cost analysis, performance measurement and strategic planning [41]. Telecommunications firms can leverage MA applications to navigate pricing strategies, investment in network infrastructure and customer retention initiatives and comply with regulatory requirements. Furthermore, the unique nature of the telecommunications sector, marked by high fixed costs, variable demand patterns and continuous technological innovation, demands a tailored approach to MA applications. Therefore, understanding how MA is employed in this industry is essential for organisations aiming to stay competitive and thrive in the evolving telecommunications landscape.

2.2. Prior Studies and Hypothesis Development

Understanding the determinants of MA application use is crucial for telecommunications companies that operate in the dynamic and competitive industry. The chosen determinants in this study, namely, company size, business strategy, market competition, accountants' qualifications, managers' awareness and organisational culture, encompass various aspects that can collectively shape MA application use.

2.2.1. Business Strategy

Telecommunications companies that employ differentiation strategies tend to rely on advanced and sophisticated MA techniques to support their innovation and product development [42–45]. Meanwhile, companies that adopt cost leadership strategies may prioritise cost control and efficiency measure MA applications [19,46]. The research community has reached a consensus on the positive relationship between business strategies and MA application use, with the latter employed to support the implementation of the former [47–49]. This research examines the relationship between business strategies and MA application use, specifically focusing on the impact of established business strategies related to domestic and foreign markets and market expansion on the use of MA applications. This study anticipates that business strategies would lead to effective MA application use, which will result in improved decision making and organisational performance. Thus, this study proposes the following hypothesis:

H1: *Business strategies will positively affect MA application use.*

2.2.2. Market Competition

Telecommunications companies operate in an intensely competitive environment, where their success hinges on their ability to effectively manage costs, measure their performance and make strategic decisions [45]. Intense competition can drive telecommunications companies to adopt advanced MA systems [36]. Such systems can provide crucial insights for cost analyses, performance measurement and strategic decision making. The adoption of sophisticated MA systems can enhance a company's competitive advantage over its

rivals in the dynamic industry [7,50]. Thus, scholars highlighted the importance of monitoring competitors through MA applications [51]. By effectively tracking and analysing competitors' performance metrics, telecommunications companies can identify areas for improvement and implement strategies to gain a competitive advantage. Telecommunications companies that apply such techniques will be able to identify cost drivers, allocate funds accurately and determine competitive pricing strategies [9,52]. Hence, this study proposes the following hypothesis:

H2: *Market competition will positively affect MA application use.*

2.2.3. Company Size

According to several studies, a company's size can significantly impact the scope and complexity of its MA applications [12,16,18]. Large companies are highly inclined to utilise MA applications to enhance their decision making and overall performance, particularly in areas such as business potential and operational technology [53]. Large telecommunications companies tend to have extensive accounting systems and resources, which will enable them to employ sophisticated MA techniques. Conversely, small companies typically face resource constraints and thus may adopt a less formal approach to MA application use [36,45]. Thus, this study proposes the following hypothesis:

H3: *A company's size will positively affect its MA application use.*

2.2.4. Accountants' Qualifications

Accountants' competence and expertise are critical to MA application use in telecommunications organisations. Skilled and knowledgeable accountants are essential for effectively implementing and utilising MA systems [5,54] and have the expertise to ensure the collection of accurate financial data to facilitate informed decision making [55]. Ahmad [27] emphasised the importance of training and professional development programmes in enhancing the competence of accountants to use MA applications. The aforementioned studies highlighted the importance of accountants' competence in driving practical MA application use. Thus, this study proposes the following hypothesis:

H4: *Accountants' qualifications can positively affect MA application use.*

2.2.5. Managers' Awareness

Managers' awareness and comprehension of the benefits and potential of MA are paramount for its successful implementation [56,57]. Managers who understand the advantages of MA will likely incorporate it into their decision-making process [55,58–60]. Furthermore, such managers will be highly inclined to support the development and implementation of new MA systems [6,61]. Organisations with managers who are aware of MA will likely use it to support their strategic objectives [56,62]. Moreover, organisations with managers who are knowledgeable in MA will likely employ it to monitor their competitors [61,63]. The findings underscored the importance of managers' perception of and attitude towards the use of MA applications in organisations [4,64]. Therefore, this study proposes the following hypothesis:

H5: *Managers' awareness will positively affect MA application use.*

2.2.6. Organisational Culture

The adoption and use of MA techniques in an organisation can be significantly influenced by organisational culture [5,65]. Organisational culture, which encompasses shared beliefs, values and norms, is vital in implementing MA techniques. The use of MA techniques may receive considerable support in firms with an open and transparent information-sharing culture. Recognising the value of MA information to decision making, such companies may facilitate MA application use by disseminating financial data and performance metrics across different levels of the organisation [3,66]. Furthermore, a cul-

ture of innovation and learning can encourage experimentation, continuous development and knowledge sharing. Organisations with such cultural orientation will likely adopt innovative MA techniques [51,67]. The managers and employees of such organisations will be receptive to exploring and adopting new approaches and practices to meet changing business needs. Moreover, a culture that values integrity, accountability and ethical behaviour can foster accurate reporting and the effective use of MA information [3,68].

Organisational culture is a critical factor that can moderate the relationship between MA application use and various determinants. Large organisations characterised by a hierarchical and bureaucratic culture may encounter challenges when adopting flexible and innovative MA techniques. Conversely, small organisations with an entrepreneurial and adaptive culture may exhibit considerable openness towards the adoption of advanced MA techniques [69,70]. The degree of alignment between organisational culture and company size can either facilitate or hinder the use of MA techniques [71–73]. In addition, different business strategies necessitate the adoption of distinct MA approaches. Organisations that employ cost leadership strategies will prioritise cost control and efficiency-oriented MA techniques, whereas organisations that use differentiation strategies will focus on product development and market-oriented MA techniques [3,21,64]. In addition, a culture that values competitiveness and market orientation can motivate the organisation to embrace advanced MA techniques to attain a competitive advantage [51,73]. Such cultures can foster the use of a proactive approach for gathering and analysing competitors' information, which may lead to the utilisation of MA techniques such as competitor analysis and strategic cost management [24,68,74]. Organisational culture can also play a role in determining the degree to which organisations respond to competitive pressure through MA application use and influence the alignment of business strategies [64,73].

Furthermore, organisational culture can moderate the impact of accountants' qualifications and managers' awareness of MA applications. An organisational culture that values expertise, learning and cooperation can enhance the utilisation of MA techniques by effectively integrating accountants' skills and knowledge into the decision-making process [3,65,73]. Similarly, a culture that fosters understanding and appreciation of the importance of MA can inspire managers to actively engage with and use MA information [3,31]. The alignment between organisational culture, accountants' qualifications and managers' awareness can influence how MA techniques are implemented in an organisation [5,69]. The studies mentioned above can provide valuable insights into the moderating role of organisational culture in the relationship between the determinants and MA application use. Thus, this study proposes the following hypothesis:

H6: *Organisational culture can moderate the effect of each of the determinants of MA application use.*

2.3. Research Framework

Prior studies significantly contributed to the advancement of knowledge on the intricate relationship between the determinants and MA application use in Vietnamese telecommunications companies. This study emphasises important determinants such as company size, business strategy, market competition, accountants' qualifications, managers' awareness and organisational culture, which are crucial in optimising MA systems and enhancing decision-making processes within the dynamic telecommunications industry. The proposed research framework is presented in Figure 1.

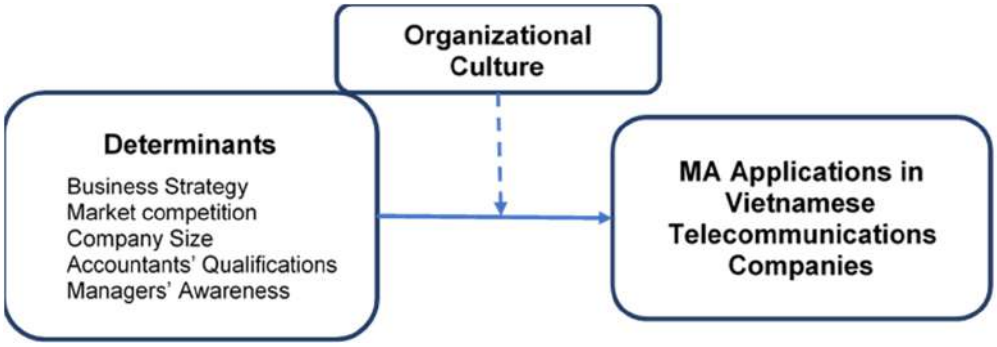

Figure 1. Conceptual research framework.

3. Research Methodology

3.1. Data Sources

A quantitative research design was employed in this study, that is, a cross-sectional survey, to explore the influence of company size, business strategy, market competition, accountants' qualifications, managers' awareness and the moderating role of organisational culture on the use of MA applications in Vietnamese telecommunications companies. The surveyed units were enterprises operating in the telecommunications industry of Vietnam, including enterprises involved in establishing networks and providing telecommunications services and equipment. The dataset was obtained from the MIC (https://mic.gov.vn/solieubaocao/Pages/TinTuc/146181/Danh-sach-cac-doanh-nghiep-co-Giay-phep-cung-cap-dich-vu-vien-thong.html (accessed on 20 June 2022); https://mic.gov.vn/solieubaocao/Pages/TinTuc/146180/Danh-sach-cac-doanh-nghiep-co-Giay-phep-thiet-lap-mang-vien-thong-cong-cong.html (accessed on 20 June 2022)) and Yellow Pages of Vietnamese Enterprises (https://www.yellowpages.com.vn/categories/235600/telecommunication-equipment-and-systems.html (accessed on 20 June 2022)) in June 2022, which consisted of 164 domestic and foreign-invested enterprises for the official survey. The survey targeted employees of the telecommunications companies who held key positions and were knowledgeable in MA applications to ensure that the answers were relevant to the research. The survey questionnaire was directly distributed to directors, vice presidents, chief financial officers, deputy finance department personnel and chief accountants. By focusing on the specific roles, this research aimed to engage employees with decision-making authority and knowledge and experience relevant to the study [75,76].

3.2. Sample Size

This study examined the company as the unit of analysis and solicited one respondent from each participating telecommunications company. A web-based survey (Google Forms) was conducted to collect the data. Based on a list on the official website of the companies, a total of 164 questionnaires were sent to the potential respondents through their email address listed on the company website, company database or social media platform. The duration of the data collection was four months, which involved sending reminders through email and phone calls. Of the 164 distributed questionnaires, 154 were duly returned and considered for the analysis. However, after careful review, it was determined that eight questionnaires contained incomplete information, which made them unsuitable for the subsequent analysis. A total of 146 valid and complete questionnaires were obtained, which yielded a response rate of 89% and could ensure the integrity and reliability of the dataset. Before the full-scale analysis, the data underwent a preparation and screening process. Firstly, the data were coded to facilitate the analysis then manually entered into Excel 2021 and SPSS. To ensure the integrity of the data, the eight questionnaires with missing responses were removed from the dataset. Secondly, data screening was conducted using the Mahalanobis distance to identify any outliers, and it was determined that no outliers were present, because the D^2/df values were less than 2.5 [77]. To assess the normality of the data, skewness and kurtosis, which are SPSS descriptive statistics techniques, were

employed, and the results revealed that the skewness and kurtosis scores fell within an acceptable range (less than 2 for skewness and less than 7 for kurtosis), thereby indicating that the data exhibited sufficient normality for further analysis.

3.3. Questionnaire Development

A Likert scale, which is a widely accepted and reliable measurement method [78], was used in the survey questionnaire to assess the constructs under investigation. A five-point Likert scale [78] was used to measure each construct, with 1 representing 'strongly disagree', 2 representing 'disagree', 3 representing 'neutral', 4 representing 'agree' and 5 representing 'strongly agree'. This study followed prior research in constructing the items for the following constructs: business strategy (three items) [19], market competition (six items) [19], company size (three items) [53], accountants' qualifications (three items) [27] and managers' awareness (five items). In addition, this study followed the approach presented by [3] to construct three items for organisational culture and five items for MA application use. Table 1 provides a summary of the items of each construct.

Table 1. Summary of construct items.

Construct	Items
Business strategy	Domestic business strategy International business strategy Investment and market development strategy
Market competition	Price competition Competition in development of new products Competition in distribution and marketing channels Market share competition Competitor actions Number of competitors
Company size	Revenue of the company Number of employees Number of departments
Accountants' qualifications	Accountants record and process accounting information and reports in accordance with the organisation's activities. The reports provided by the management accountants are accurate and highly appreciated by the managers. Improving the accounting staff's competence is necessary to help the unit develop sustainably.
Managers' awareness	Managers appreciate the usefulness of MA techniques. Managers are knowledgeable in the use of MA techniques. Managers need MA techniques. MA reports provide information to managers for making decisions. Managers must enrol in courses on accounting for managers.
Organisational culture	The company employees receive support from their managers. Mutual support exists among the members of the company. There is a consensus on the development goals of the company.
MA application use in Vietnamese telecommunications companies	The company applies MA techniques to control costs. The company applies MA techniques to calculate the break-even point. The company employs MA techniques for budgeting. The company applies MA techniques to support the decision-making process. The company applies MA techniques to assist in achieving the strategic objectives.

Before the questionnaire was distributed to collect data, a pretest was conducted to ensure the content validity and clarity of the measurement, which involved several steps. Firstly, the items were selected after a thorough literature review. Secondly, experts in the field were engaged to evaluate the questionnaire. Specifically, two accounting and finance experts from academia were recruited for the evaluation. Lastly, the questionnaire was sent to a qualified language centre for proofreading to ensure the use of correct English grammar and a professional tone. The selected items remained unchanged, with no additions or deletion. However, certain questions were modified to improve clarity. A total of 20 individuals from the telecommunications industry were recruited for the pilot study to assess the statistical testing procedures. The internal consistency reliability of each item was measured using Cronbach's alpha, and all the Cronbach's alpha values were greater than 0.70 [77]; thus, the measurement used in this study was valid and reliable.

Partial least squares structural equation modelling (PLS-SEM) was conducted, as a widely used technique in the social sciences, such as organisational management, management information systems and MA [79,80]. This study provides an overview of PLS-SEM and its application, utilising SPSS 26 and SmartPLS 4.0, for the data analysis. PLS-SEM encompasses various statistical techniques for evaluating the model fit and measuring relationships between variables. It employs reflective measurement models that can examine connections between latent variables and their indicators, considering aspects such as reflective indicator loadings, internal consistency reliability, convergent validity and discriminant validity. In addition, PLS-SEM uses formative measurement models to generate composite scores from the indicators, evaluating aspects such as convergent validity, collinearity, the statistical significance of weights and the R^2 value. Furthermore, it employs goodness-of-fit indicators such as the standardised root mean square residual (SRMR) and normed fit index (NFI). This study also performed a bootstrap-based test to assess the statistical inference between the empirical and theoretical covariance matrices in the PLS-SEM analysis.

4. Results and Discussion

4.1. Respondents' Profile

A total of 164 survey questionnaires were distributed to potential respondents, and a total of 146 valid and complete responses were secured, with an 89% response rate, which was considered to be appropriate for this study [81]. The data analysis in Table 2 revealed essential information about the respondents and characteristics of the Vietnamese telecommunications companies. The distribution of the respondents' positions was relatively uniform, with no dominating category. Among the respondents, 19.18% were managers, 20.55% were chief accountants, 27.40% were vice directors and another 27.40% were directors. A noteworthy observation was that the majority of the respondents, that is, approximately 76.71%, were employed by a state-owned company. This finding underscored the prominence of state-owned enterprises in the Vietnamese telecommunications industry and highlighted the role of such entities in shaping MA application use. Furthermore, over half of the surveyed companies, that is, 58.21%, had a capital exceeding Vietnamese Dong (VND) 20 billion, which indicated the financial robustness of the organisations.

In addition, an overwhelming majority of the surveyed companies, that is, 95.89%, generated an annual revenue of over VND 55 billion, thereby underscoring the significant scale of the operations of the telecommunications industry of Vietnam. Moreover, a substantial number of employees of the telecommunications companies, that is, 93.15%, were below the age of 50 years. Collectively, the statistics can shed light on the distinct characteristics of Vietnamese telecommunications companies and affirm the reliability and validity of the analysed data.

Table 2. Profile of respondents.

Demographic Characteristics		Number	Rate
Company ownership	Private	34	23.29%
	State	112	76.71%
Position	Director	40	27.40%
	Vice director	40	27.40%
	Manager	28	19.18%
	Chief accountant	38	26.03%
Revenue (VND)	≤55 billion	6	4.11%
	>55 billion to ≤270 billion	109	74.66%
	>270 billion	31	21.23%
Capital (VND)	≤10 billion	20	13.70%
	>10 billion to ≤20 billion	41	28.08%
	>20 billion to ≤100 billion	82	56.16%
	>100 billion to ≤500 billion	3	2.05%
Number of employees	≤10	16	10.96%
	>10 to ≤50	120	82.19%
	>50 to ≤100	2	1.37%
	>100	8	5.48%

Note: The total number of respondents was 146.

4.2. Data Processing

The collected data were comprehensively analysed to test the reliability and internal consistency of the constructs, and PLS models were developed using Smart-PLS 4.0. The recommended measurement models were carefully examined, considering the various factors critical to their validity. Reflective indicator loadings, internal consistency reliability, convergent validity and discriminant validity were thoroughly evaluated for the reflective measurement models, whereas convergent validity, collinearity, the statistical significance of weights and the R^2 value were considered for the formative measurement models.

Several goodness-of-fit indicators were employed to evaluate the model fit, such as the SRMR and NFI. The indicators provided valuable insights into the overall fit of the model and its compatibility with the observed data.

Furthermore, a bootstrap-based test was conducted using 5000 resamples to determine the significance of the path coefficients and loadings. This procedure helped establish the statistical inference between the empirical and theoretical covariance matrices, thereby strengthening the validity and robustness of the results [80]. PLS-SEM was conducted owing to its suitability for exploratory research and ability to handle small sample sizes effectively. This study involved 146 observations; thus, PLS-SEM was deemed appropriate for the research context [79].

4.3. Regression Results

Table 3 showcases the robustness of the measurement model, because all the factors exhibited a high loading, ranging from 0.767 to 0.949, on their indicators. The loadings indicated strong construct validity and suggested that the factors effectively captured the underlying concepts they represented. The average variance extracted (AVE) values, which ranged from 0.674 to 0.883, surpassed the threshold of 0.50 and indicated that the constructs accounted for a significant proportion of the variance in their indicators. This result demonstrated the satisfactory convergent validity, because each construct captured at least 67.4% of the variance of its indicators.

Table 3. Construct validity and reliability.

Construct	Items	Loadings	AVE	CR (rho_a)	Cronbach's Alpha
Business strategy (BSTR)	Domestic business strategy	0.920	0.825	0.894	0.894
	International business strategy	0.915			
	Investment and market development strategy	0.889			
Market competition (COMP)	Price competition	0.884	0.771	0.942	0.940
	Competition in development of new products	0.884			
	Competition in distribution and marketing channels	0.904			
	Market share competition	0.824			
	Competitor actions	0.905			
	Number of competitors	0.866			
Company size (SIZE)	Revenue of the company	0.943	0.883	0.936	0.933
	Number of employees	0.928			
	Number of departments	0.947			
Accountants' qualifications (QUAC)	Accountants record and process accounting information and reports in accordance with the organisation's activities.	0.948	0.859	0.920	0.918
	The reports provided by the management accountants are accurate and highly appreciated by the managers.	0.914			
	Improving the accounting staff's competence is necessary to help the unit develop sustainably.	0.918			
Managers' awareness (AMAG)	Managers appreciate the usefulness of MA techniques.	0.852	0.726	0.915	0.905
	Managers are knowledgeable in the use of MA techniques.	0.813			
	Managers need MA techniques.	0.905			
	MA reports provide information to managers for making decisions.	0.900			
	Managers must enrol in courses on accounting for managers.	0.783			
Organisational culture (OCUL)	The company employees receive support from their managers.	0.920	0.771	0.851	0.851
	Mutual support exists among the members of the company.	0.848			
	There is a consensus on the development goals of the company.	0.865			
MA application use in Vietnamese telecommunications companies (MAAP)	The company applies MA techniques to control costs.	0.827	0.751	0.918	0.917
	The company applies MA techniques to calculate the break-even point.	0.915			
	The company employs MA techniques for budgeting.	0.873			
	The company applies MA techniques to support the decision-making process.	0.881			
	The company applies MA techniques to assist in achieving the strategic objectives.	0.834			

Note: MAAP is the dependent variable; BSTR, COMP, SIZE, QUAC and AMAG are the independent variables; OCUL is the moderating variable.

The composite reliability (CR) values, which ranged from 0.851 to 0.942, exceeded the recommended threshold of 0.70, thereby indicating high internal consistency reliability. The values suggested that the indicators of each construct consistently measured the same underlying concept. Moreover, all the constructs had a Cronbach's alpha value that was higher than 0.8, which further supported their high internal consistency reliability. The findings substantiated the effectiveness of the suggested measurement model in accurately representing the relationship between the latent variables and their indicators, thereby ensuring the reliability and validity of the model [79,80]. Furthermore, the discriminant validity of the measurement model shown in Table 3 can further confirm its validity and reliability.

Based on the data presented in Table 4, the Fornell–Larcker criterion analysis confirmed the discriminant validity of the constructs. The square root of the AVE of each

construct exceeded 0.851, which indicated that the constructs explained a more significant proportion of the variance in their indicators than the correlation between the constructs. The correlation values ranged from 0.388 to 0.810, which supported the distinctiveness of the constructs. The findings aligned with the discriminant validity criterion and indicated that each construct measured a unique aspect of the phenomenon under investigation.

Table 4. Discriminant validity.

Fornell–Larcker Criterion							
	AMAG	BSTR	**COMP**	**MAAP**	**OCUL**	**QUAC**	**SIZE**
AMAG	**0.852**						
BSTR	0.633	**0.908**					
COMP	0.783	0.739	**0.878**				
MAAP	0.743	0.710	0.810	**0.867**			
OCUL	0.510	0.523	0.555	0.631	**0.878**		
QUAC	0.718	0.620	0.785	0.766	0.494	**0.927**	
SIZE	0.589	0.555	0.644	0.635	0.388	0.612	**0.939**
HTMT Ratio Matrix							
	AMAG	**BSTR**	**COMP**	**MAAP**	**OCUL**	**QUAC**	**SIZE**
AMAG	-						
BSTR	**0.699**	-					
COMP	0.843	**0.806**	-				
MAAP	0.810	0.782	**0.872**	-			
OCUL	0.582	0.600	0.620	**0.715**	-		
QUAC	0.784	0.684	0.844	0.833	**0.559**	-	
SIZE	0.639	0.607	0.686	0.684	0.433	**0.661**	-

Note: MAAP is the dependent variable; SIZE, BSTR, COMP, QUAC and AMAG are the independent variables; OCUL is the moderating variable; values on the diagonal (bolded) are the square root of the AVE; off-diagonals are correlations.

Furthermore, the heterotrait–monotrait (HTMT) matrix, which can compare the correlations between different constructs precisely, further supported the discriminant validity. The matrix revealed that all the construct pairs in the SEM had a value ranging from 0.433 to 0.872, which is below the discriminant validity threshold of 0.90. The results demonstrated that the correlations between the constructs were smaller than the correlations within the constructs, thereby reinforcing the distinctiveness of each construct.

The results provided strong evidence for the discriminant validity of the measurement model. The Fornell–Larcker criterion and HTMT matrix analysis affirmed that the constructs were distinct and can be measured reliably as separate entities, which ensured that the model accurately captured the unique dimensions of the research variables, allowing for the accurate interpretation and analysis of the relationships between the constructs [77,79,82].

The results in Table 5 demonstrated statistically significant positive relationships between MA application use in Vietnamese telecommunications companies and the different variables. Specifically, business strategy, market competition, company size, accountants' qualifications and managers' awareness exhibited a significant positive association with MA application use. The beta coefficients of the variables were more significant than zero, which indicated their positive effect on MA application use. In addition, the corresponding *p*-values of the relationships were below the threshold of 0.05 (95% significance level), which suggested statistical significance. However, the relationship between MA application use and company size was not statistically significant, with a *p*-value of 0.101. The results confirmed the hypothesised connection between the crucial factors, namely, business strategy, market competition, accountants' qualifications and managers' awareness, and their substantial positive impact on MA application use. Thus, H1, H2, H4 and H5 were supported.

Table 5. Formative measurement models.

Hypothesis	Model 1					Model 2				
	Beta	**Std.**	***p* Value**	**VIF**	**F-Square**	**Beta**	**Std.**	***p* Value**	**VIF**	**F-Square**
SIZE → MAAP	0.099	0.060	0.101	4.709	0.020	0.149	0.076	0.050	4.709	0.038
BSTR → MAAP	0.186	0.063	0.003	3.147	0.058	0.150	0.063	0.017	3.147	0.038
QUAC → MAAP	0.245	0.071	0.001	4.465	0.079	0.198	0.077	0.010	4.465	0.056
COMP → MAAP	0.287	0.091	0.002	4.117	0.071	0.216	0.102	0.033	4.117	0.042
AMAG → MAAP	0.166	0.076	0.030	3.538	0.037	0.185	0.085	0.029	3.538	0.050
OCUL → MAAP						0.233	0.054	0.000	2.915	0.147
OCUL × SIZE → MAAP						0.148	0.053	0.005	1.000	0.062
OCUL × BSTR → MAAP						−0.021	0.058	0.720	1.000	0.001
OCUL × QUAC → MAAP						0.096	0.080	0.229	1.000	0.013
OCUL × COMP → MAAP						0.001	0.089	0.993	1.000	0.000
ECON × AMAG → MAAP						−0.187	0.086	0.030	1.000	0.038
Model fit (SRMR)			0.043					0.044		
Model fit (NFI)			0.873					0.856		
Adjusted R-squared			0.729					0.763		

Note: The value of VIF is adopted from the outer model layout with max. value; model fit adopted from estimated model layout; Model 1 excluded moderating variable; Model 2 included moderating variable.

The examination of the moderating role of organisational culture provided a nuanced understanding of the relationships within the model. Initially, when organisational culture was not considered as a moderator, the relationship between MA application use and company size was not statistically significant. However, when organisational culture was included as a moderating variable, the relationship became statistically significant, with a *p*-value of 0.05 (95% significance level). This result suggested that organisational culture played a moderating role in the relationship between company size and MA application use. The influence of organisational culture may improve our understanding of how organisational cultural factors can impact the extent to which company size can affect MA application use. Thus, the hypothesis stating that organisational culture can significantly moderate the association between company size and MA application use was supported.

Moreover, the analysis revealed that organisational culture moderated the relationship between MA application use and accountants' qualifications. The moderation effect was statistically significant at 95%, with a *p*-value of 0.05. However, it should be noted that the moderating role of organisational culture in this relationship was negative, as indicated by the beta coefficient of -0.187. This result suggested that organisational culture had a dampening effect on the relationship between MA application use and managers' awareness. The influence of organisational culture may impede the extent to which managers' awareness can positively affect the implementation of MA practices. Hence, the hypothesis stating that organisational culture can significantly moderate the association between managers' awareness and MA application use was supported.

The analysis of the SEMs confirmed that Model 1 and Model 2 exhibited a significant fit with the data, thereby providing strong support for the proposed relationships between the variables. The SRMR value of 0.043 for Model 1 and 0.044 for Model 2 indicated an acceptable model fit. The values fell within the acceptable range and suggested that the observed data align well with the proposed relationships between the variables. In addition, the NFI value of 0.873 for Model 1 and 0.856 for Model 2 further supported the reasonable fit of both models with the data. The values indicated that the models adequately captured the underlying relationships between the variables. The adjusted R-squared values can provide insights into the explanatory power of the models. Both models demonstrated reliable explanatory power, with a value of 0.729 for Model 1 and 0.763 for Model 2. The values indicated that the independent variables included in the models accounted for a significant proportion of the variance in the dependent variable. Specifically, Model 1 explained 72.9%, and Model 2 explained 76.3% of the variance.

The results provided strong evidence for the discriminant validity of the measurement model. The Fornell–Larcker criterion and HTMT matrix analysis affirmed that the constructs were distinct and can be reliably measured as separate entities, which ensured that

the model accurately captured the unique dimensions of the research variables, allowing for the accurate interpretation and analysis of the relationships between the constructs [77,79].

The findings presented in Figure 2 can provide compelling evidence supporting the positive relationship between business strategy, accountants' qualifications, market competition and managers' awareness and MA application use in Vietnamese telecommunications companies.

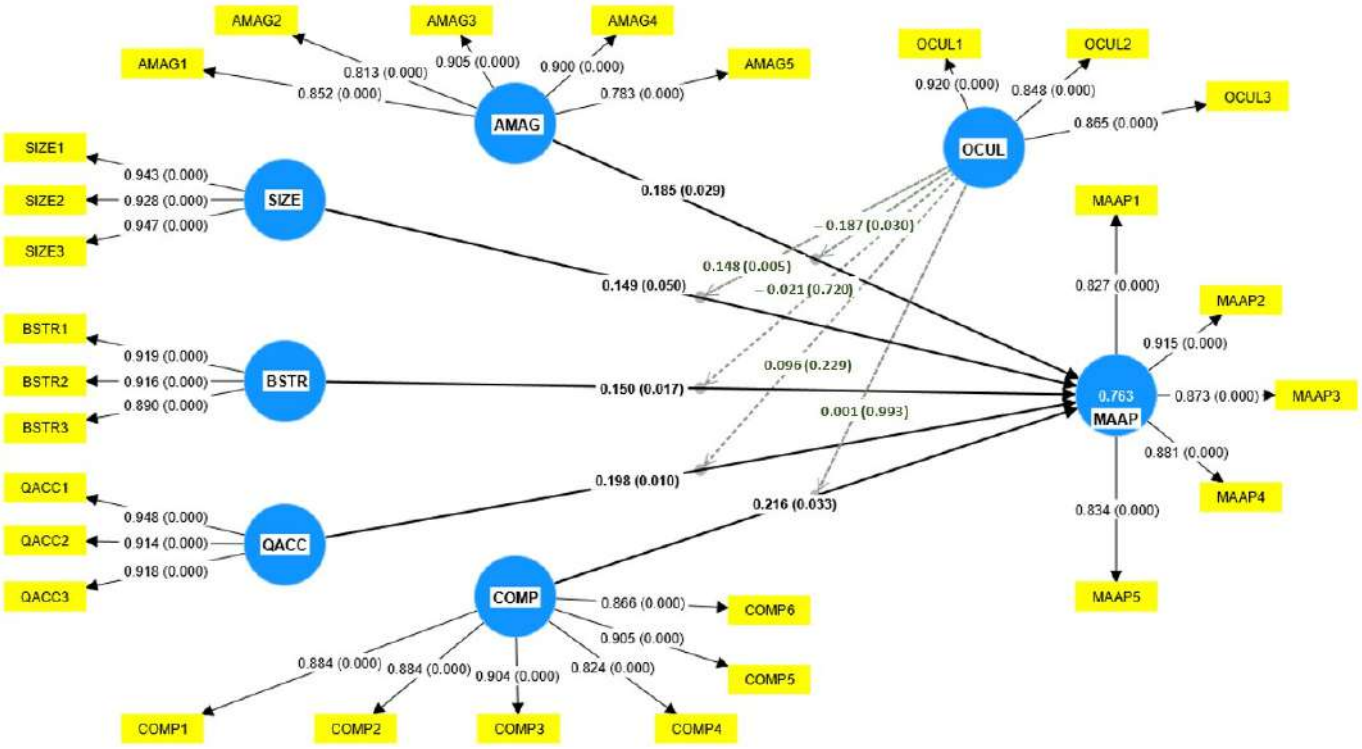

Figure 2. Structural model.

4.4. Discussion of Findings

The results demonstrated that business strategy, market competition, accountants' qualifications and managers' awareness played a crucial role in driving the adoption and implementation of MA applications in the telecommunications industry of Vietnam. The positive relationships indicated that as an organisation's business strategy aligned with its goals and objectives, its likelihood of using practical MA applications will increase [27,36,48,64]. Similarly, accountants' qualifications and expertise, the competitive landscape represented by market competition and managers' level of awareness contributed significantly to the successful MA application use of the telecommunications companies [4,7,50,56,62].

The study results indicated that competition was a significant concern of the Vietnamese telecommunications companies, as evidenced by the highest beta coefficient of 0.287. The telecommunications industry is highly dynamic and characterised by rapid technological advancements and changing customer preferences. Thus, the companies operating in this industry face intense competition from domestic and international players. This finding highlighted the importance of recognising the competitive landscape within the telecommunications service market, where price competition, new product offerings and customer acquisition are the prominent strategies that companies employ to enhance their market share [7,50,52].

Moreover, this study uncovered the fascinating moderating role of organisational culture in the context of MA application use in Vietnamese telecommunications companies. The findings indicated that organisational culture can significantly moderate the effect of company size on MA application use. This intriguing result suggested that the impact of company size on MA application use was contingent upon the prevailing organisational

culture within the telecommunications company. Organisational culture reflects the shared values, beliefs and priorities of the workforce, which implies that organisations with a culture that values data-driven decision making, financial transparency and commitment to continuous improvement will have a high likelihood of embracing and using MA applications effectively. Such cultural attributes align with the objectives of MA, such as providing accurate financial information, enabling effective decision making and optimising resource allocation. This result is consistent with that of [51,67], who confirmed that organisations with such cultural orientation will likely adopt innovative MA techniques. In addition, in organisations that place strong emphasis on innovation and flexibility, a large company size may be associated with significant resources and capabilities for implementing MA applications effectively [69,70].

Meanwhile, organisational culture may weaken managers' awareness of and commitment to using MA tools. Some organisational cultures may demonstrate strong resistance to change. Managers may be accustomed to traditional decision making and financial management methods; thus, the introduction of new MA tools and practices may be met with scepticism or hostility. Such resistance can manifest as lack of awareness of and commitment to adopting MA tools. Moreover, managers' attitudes and behaviours can strongly shape organisational culture. If leaders are not committed to the use of MA tools or do not prioritise their adoption, then managers may not value such tools and their use within the organisation. However, this result contradicts that of [3,31], who emphasised that organisational culture that nurtures the comprehension and recognition of the significance of MA applications can motivate managers to proactively embrace and leverage MA data.

Moreover, the research findings emphasised the significance of managerial awareness of and attention to MA application use. The findings can provide valuable insights for guiding and promoting MA application use in companies. The effectiveness of MA relies largely on the capabilities of accountants, who can utilise such techniques to provide information to managers [4,5]. This study's findings emphasised the crucial role of organisational culture in shaping multiple dimensions of an organisation and highlighted the importance of creating a culture that will regulate and promote employee and managerial support, foster mutual support among the staff members and align the organisation towards sustainable development [5,65,73]. In the dynamic telecommunications industry, which operates across diverse regions, support and cohesion among the members of an organisation will play a pivotal role in the pursuit of the organisation's shared objectives. The results also highlighted the significance of cultivating a strong and positive organisational culture that will facilitate collaboration, teamwork and a collective focus on the achievement of sustainable growth and success.

5. Conclusions and Recommendations

5.1. Conclusions

Intense competitive pressure can drive Vietnamese telecommunications companies to adopt sophisticated MA systems to gain a competitive advantage over their rivals [7,50]. To achieve such an objective, companies must develop domestic and international business strategies, invest in their market share and lead research on and the implementation of 5G technology. The use of MA applications has become essential to decision-making processes [27,42], and business strategies can positively impact the use of MA systems in Vietnamese telecommunications companies.

The findings indicate that within the telecommunications sector of Vietnam, the adoption and implementation of MA applications are significantly influenced by factors such as business strategy, market competition, accountants' qualifications and managers' awareness. Such factors are pivotal in shaping the utilisation of MA tools in the industry. Firstly, the results show that a well-defined business strategy can guide resource allocation. MA applications can assist in tracking and optimising resource allocation based on strategic priorities and ensure that financial resources are directed towards activities that support the chosen strategy [47–49]. Secondly, market competition will typically result in the need

to attract and retain customers [45]. MA applications can help identify the most profitable customer segments, thereby enabling companies to tailor their marketing and retention efforts accordingly. Thirdly, accountants' qualifications can significantly positively influence MA application use. This finding indicates that accountants with strong qualifications and technical expertise in MA will be able to implement and utilise MA applications effectively. They will also be able to navigate complex financial data, create accurate reports and provide valuable insights to support decision making [5,54]. With respect to managers' awareness, the results confirm that managers who are aware of the capabilities of MA tools will likely use them to support their decisions [56,57]. Furthermore, such managers will understand the value of data-driven decision making and will be able to leverage MA information to make informed choices.

This study's findings can offer valuable insights into the factors that can influence the use of MA applications in Vietnamese telecommunications companies. Specifically, this study reveals that business strategy, accountants' qualifications, market competition and managers' awareness positively impact companies' use of MA applications. The findings underscore the importance of the factors in shaping the MA applications and strategies employed by telecommunications companies in Vietnam. By considering and prioritising such factors, companies can enhance their MA practice and improve their decision-making processes, which may ultimately lead to improved performance and competitiveness in the industry.

In addition, this study emphasises the crucial role of organisational culture in the context of MA application use in Vietnamese telecommunications companies. The findings reveal that organisational culture plays a significant role in promoting the influence of organisational scale on MA application use. Moreover, organisational culture can enhance the impact of managers' awareness on MA application use. The findings indicate the importance of a supportive and conducive organisational culture in facilitating the use of practical MA applications and highlight the need for telecommunications companies to cultivate a culture that values and supports the use of MA techniques, because such a culture can significantly influence the successful adoption and effectiveness of MA practices.

5.2. Research Implications

This study can provide practical implications to policymakers, practitioners and investors. The findings can provide valuable insights into the complex dynamics of the telecommunications industry and highlight the importance of considering a company's organisational culture before implementing an MA system. The insights have significant implications for researchers and practitioners. With respect to policymakers, they should monitor and regulate competition in the telecommunications sector to ensure a healthy and competitive market that incentivises companies to use MA tools effectively to gain a competitive edge. Moreover, policymakers can encourage initiatives to enhance the qualifications of accountants and managers in the industry through educational programmes and training. Professional development can improve the adoption of MA practices; thus, MA practices in the telecommunications industry should be further examined, as well as other factors that may influence their effectiveness.

For practitioners, telecommunications companies should align their business strategies with MA practices to ensure that the latter will support their strategic objectives, including integrating MA into the decision-making process. In addition, firms should invest in the qualifications of their accountants and financial personnel to enhance their ability to use MA applications effectively. Continuous training and development programmes are crucial. Management teams should also use MA tools for their resource allocation decisions to ensure that investments align with strategic priorities and resources are allocated efficiently to maintain the company's competitiveness.

Practitioners can use the research findings to clearly understand the importance of creating a supportive organisational culture that aligns with their business strategies and goals. By fostering a culture that values and promotes the use of MA applications, companies in the telecommunications industry can enhance the effectiveness and success of their MA initiatives, which can lead to improved decision-making processes and overall performance. Furthermore, shaping and planning the development of an organisational culture that aligns with the company's strategic growth objectives will be of utmost importance. The creation of an environment that supports and encourages the use of MA applications is vital for business success. Goals can be achieved by fostering a culture that values continuous learning, collaboration and innovation. Companies should also emphasise the importance of managerial support and cooperation among employees to enhance the effectiveness of their MA applications.

Meanwhile, investors should assess how telecommunications companies incorporate MA applications into their long-term strategies. Companies that use MA to support their strategic decision making may be better positioned for long-term success.

The contribution of this study to the academic field is highly significant, because it adds empirical evidence to the motivating factors behind the use of MA applications in the telecommunications industry. By confirming the influence of market competition, business strategy, managers' awareness and accountants' qualifications, this research enhances understanding of the factors that can drive the adoption and implementation of MA practices in the telecommunications industry. Furthermore, this study opens avenues for future research to explore other factors that may impact the use of MA applications in telecommunications companies. Researchers can further investigate the most effective MA applications and techniques for the industry and delve into the nuanced role of organisational culture in shaping accounting practices.

5.3. Limitations and Recommendations for Future Studies

This study can provide valuable insights into the factors that can drive the use of MA applications in telecommunications companies in Vietnam; however, its limitations should be acknowledged. The limitations highlight opportunities for future research to enhance our understanding of this complex subject. Firstly, the generalisability of the findings may be limited owing to the study's focus on a specific geographic context, that is, telecommunications companies in Vietnam. To gain a comprehensive perspective, future studies should consider a broad range of contexts, including multinational telecommunications companies from various countries, which would enable a thorough exploration of the determinants of MA application use across nations and industries. Secondly, this study focuses on a relatively narrow set of determinants and thus may not have fully captured all the factors that can influence MA application use in telecommunications companies. Important variables such as leadership style, industry-specific characteristics and internal control systems could play a significant role in shaping the adoption of MA practices. Therefore, future research should examine such factors to provide a comprehensive understanding of the multifaceted nature of MA applications. Moreover, the specific mechanisms through which organisational culture moderates the different relationships warrant further investigation [71–73]. Thirdly, the research design was cross-sectional, which limited our ability to establish causal relationships between the identified determinants and MA application use. To overcome this limitation, future studies could employ a longitudinal research design, which would allow for the tracking of changes and development in MA applications over time and provide a robust understanding of the causal relationships between the determinants and their impact on MA practices. Lastly, this study employed path analysis, specifically SEM with PLS-SEM, to achieve the research objectives. Future studies may use other methods, such as the hybridisation of PLS-SEM with multicriteria decision-making methods [83,84] and artificial neural networks [85].

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