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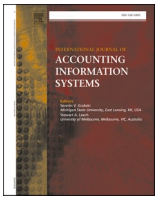

Enablers, barriers and strategies for adopting new technology in accounting

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ABSTRACT

Although the benefits of technological innovation are widely recognised, the accounting profession continues to undervalue and inadequately leverage technologies such as artificial intelligence, robotic process automation and blockchain. This study builds on earlier work on the antecedents and barriers to technology adoption and considers the role of technological, organisational and environmental factors in the accounting context. The mixed methods design involved surveying 585 accounting managers in Australia and parts of South-East Asia and interviewing 20 Australian accounting managers. Using the Technology–Organisation–Environment model, the study explored differences in the importance of factors by region and organisational type and investigated manager perspectives on strategies to support adoption. Findings indicated that security and privacy concerns are paramount to decision-making, while environment-related factors were of less importance. Prioritised strategies included staying informed of technological innovation, encouraging staff engagement and support, and implementing effective project management. The study illuminates the critical role of professional associations and industry bodies in providing tailored support for members to foster greater technological orientation and advance in the accounting profession, including advocating for high-level, technology-related strategies to drive organisational transformation.

1. Introduction

Accounting has been one of the industries most impacted by automation and digitisation, with significant changes to functions, roles and responsibilities (CPA Australia, 2019; Davern et al., 2019). Despite global recognition of the benefits of technological innovation (Masli et al., 2010; World Economic Forum, 2015), the profession is considered to lag behind others in the adoption of certain technologies (Bakarich and O'Brien, 2021; Institute of Singapore Chartered Accountants, 2017; Sage, 2019; Schmidt et al., 2020), although there has been some improvement since the COVID-19 pandemic (CPA Australia, 2021a). Accordingly, researchers have explored the antecedents of the adoption of certain technologies, such as artificial intelligence (AI), robotic process automation (RPA) and blockchain, in the accounting context, as well as the barriers and challenges that organisations face (e.g., CPA Australia, 2021b; Krieger et al., 2021; Raguseo, 2018).

Studies on the factors predicting technology adoption are often theoretically framed using the Technology-Organisation-Environment (TOE) model (Tornatzky and Fleischer, 1990), which broadly classifies antecedents into the dimensions of

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Technology (e.g., cost savings and advantages created by implementation), Organisation (e.g., management and staff support) and Environment (e.g., pressure from competitors and regulation). This study sought to examine enablers and barriers to technology adoption in the accounting profession through the theoretical lens of the TOE framework and to identify associated strategic solutions to enhance adoption to support organic growth and organisational sustainability. The study posed the following research questions: (i) what are the roles of TOE factors in adopting technologies in accounting and do these vary by region and organisational type, (ii) what barriers are inhibiting technology adoption, and (iii) what strategies can support the adoption of technology?

The mixed methods design involved surveying 585 accounting managers in Australia and parts of South-East Asia and conducting interviews with 20 Australian accounting managers. Findings indicated security and privacy concerns are paramount to decision-making, particularly in South-East Asia, while Environment-related factors were of less importance. Managers emphasised the role of certain organisational factors, particularly support from top management and staff and understanding the relative advantage of introducing the technology. Prioritised strategies included staying informed of technological innovation, encouraging staff engagement and support and implementing effective project management. Management perspectives on challenges and strategies for overcoming barriers varied in different ways by organisation setting and the country in which the managers were located.

The study addresses the lack of empirical analyses of technology adoption in accounting literature (Moll and Yigitbasioglu, 2019) and extends our knowledge of antecedents and barriers by applying the TOE framework in the accounting context. While earlier work often investigated a particular type of technology, we considered technology in a broad sense and investigated how adoption may be impacted by contextual factors, such as region and organisation type. Indeed, the qualitative data offers valuable insights from managers in diverse geographical and organisational contexts on the nature of challenges to technology adoption and how they can be resolved. Consequently, the study identifies important implications for relevant stakeholders and provides guidance on theoretically informed ways to overcome challenges and proactively advance technology adoption in different settings. In particular, the study illuminates how organisations tend to focus on the operational aspects of technology adoption and lack high-level, technology-related strategies, which are critical for driving organisational transformation. This points to the important role of professional associations and industry bodies in providing tailored support for members to formulate strategies that foster greater technological orientation and advance. There are also implications for higher education providers concerning collaborating with the profession and accrediting bodies to develop curricula that prepare future workers by helping them develop the requisite skills and knowledge for technology adoption.

The paper first provides an overview of the TOE framework, paying particular attention to studies in the accounting context. Next, we introduce the methodology, followed by the analyses and results. We conclude by discussing the findings, the study's limitations, and directions for future research.

2. Background

2.1. TOE framework

Different theoretical models have been used to evaluate various factors that influence organisations' adoption of technological innovations. While no single framework is assumed to be superior, the TOE framework (Tornatzky and Fleischer, 1990) is considered robust and comprehensive and captures a diverse range of influences at the organisational level (e.g., Awa et al., 2017; Gangwar et al., 2014). It contrasts with models that examine behavioural aspects of individuals in adopting technology (Oliveira and Martins, 2011), such as the Technology Acceptance Model (Davis, 1989) and the Theory of Planned Behaviour (Ajzen, 1985). An advantage of the TOE model is that it explores both internal and external antecedents (and challenges) that can influence adoption (Hossain and Quaddus, 2011). It is notable that the framework has been applied across various industries, as well as diverse technologies (Oliveira and Martins, 2011), including blockchain, data visualisation, cloud computing and AI (Damerji and Salimi, 2021; Shimba, 2010; Tarmidi et al., 2014; Woodside et al., 2017). Wen and Chen (2010) highlighted its relevance for different organisation types, including both small and large organisations.

The three TOE factors have been extended over time, and their constituent elements are as follows. Broadly, Technology encapsulates organisational knowledge, resources and staff capability. It includes security concerns, cost savings, compatibility with existing technology, operations and organisational culture, and technological competence. The Organisation factor comprises top management support (e.g., accepting risk, leading adoption and providing overall support), staff support (including motivation to adopt and appreciation of the value of technology), organisation support (such as guiding, supporting and resourcing staff) and the extent to which an organisation is technologically oriented in terms of policies, openness to experimenting with technology and engagement in technological forecasting. The Environment factor encompasses competitive pressure, meaning competitive advantage and the influence on and from competitors to their organisation, and regulatory support, such as the adequacy and understanding of laws and regulations related to technology.

2.2. The accounting context

Technology is a widely used term and can apply to different forms of technologies across diverse industries, such as customer relationship management (systems for managing client relationships and processes), enterprise resource planning (systems that integrate and manage business processes across functions and at different organisational levels), RPA (using rules/triggers to perform automated tasks), AI (mimicking human capabilities to perform diverse functions), blockchain (real-time transparent sharing and integration of information) and cloud computing (computing services delivered on the internet). Innovations in these technologies

continue to disrupt workflows, processes and responsibilities in accounting (Frizzo-Barker et al., 2020; Kokina et al., 2017) and are widely recognised as bringing diverse operational benefits to the profession.

Examples of key benefits are improved efficiency and more effective business processes, increased flexibility in generating information and integrating applications, and better financial reporting (CPA Australia, 2019; Fawcett, 2015; Kanellou and Spathis, 2012). CPA Australia (2021b) highlighted some key drivers for adopting technology: accessing cost savings, improving the client experience, achieving operational efficiencies and developing a culture of innovation. Despite these benefits, some claim the profession does not appreciate the potential value of adoption (e.g., Casterella et al., 2019; Schmidt et al., 2020) and is not sufficiently leveraging emergent and advanced technologies to improve business functions and processes (Salijeni et al., 2019).

Low take-up in the profession is attributed to many reasons, aligning with the TOE factors. Some have highlighted issues with technology compatibility or complexity, gaps in employee competencies and the complexity of involving clients in using the systems (Bradford and Florin, 2003; Rosli et al., 2013). Other Technology concerns include financially resourcing technology, staffing and the integration of technology with existing organisational structures and systems (Walsh et al., 2021). Security concerns continue to rise, given widely publicised data breaches, and organisations remain concerned about suitable infrastructure and cyber-incident response capabilities (e.g., Fawcett, 2015). Boal (2018) noted the importance of organisations promoting robust and reliable security protections alongside emergent technology (e.g., compliance measures and data privacy policies and processes) to enable them to leverage competitive advantage through differentiated client service and digital capability.

Organisation-related barriers often concern people. Employees may feel disrupted by emergent technology (Fawcett, 2015) and worry that their jobs are at risk (Roos, 2015). Their knowledge, skills, motivations and mindsets regarding technology can have a significant influence on adoption; this applies to all employees, including senior professionals and management (Jackson et al., 2022a), and has led to widespread pressure to improve staff's skills and knowledge regarding technology (Damerji and Salimi, 2021; Vasarhelyi et al., 2012). With respect to the Environment dimension, security and privacy concerns and uncertainty about government regulations have led to calls to improve laws and regulations relating to technology (Shimba, 2010; Woodside et al., 2017). Regulatory support must sufficiently protect diverse stakeholders and instil confidence in organisations to adapt to rapidly evolving technological contexts (Frizzo-Barker et al., 2020; Prewett et al., 2020), and the support of regulators and professional bodies is critical (Li et al., 2018).

Table 1
Summary of participant characteristics ($n = 602$).

Characteristic	Sub-groups	Australia (n = 422)						SE Asia (n = 180)	
		Survey only (n = 482)		Interview only (n = 17)		Both (n = 3)		Survey only	
		n	%	n	%	n	%	n	%
Position	Proprietor/Director	109	27.1	5	29.4	0	0	36	20.0
	Executive/Senior Manager	94	23.4	8	47.1	1	33.3	75	41.7
	Manager	199	49.5	4	23.5	2	66.7	69	38.3
Gender	Male	201	50.0	13	76.5	2	66.7	97	53.9
	Female	201	50.0	4	23.5	1	33.3	83	46.1
Area type	Metropolitan	346	86.1	17	100	3	100	100	100
	Regional	56	13.9	0	0	0	0	0	0
Country	Hong Kong							26	14.4
	Singapore							154	85.6
Organisation size	Micro/small (1–19 employees)	176	43.8	2	11.8	1	33.3	38	21.1
	Medium (20–199 employees)	161	40.0	4	23.5	2	66.7	72	40.0
	Large (200 + employees)	65	16.2	11	64.7	0	0	70	38.9
Sector	Public	36	9.0	1	5.9	0	0	12	6.7
	Private	349	86.8	15	88.2	3	100	165	91.7
	Not-for-profit	17	4.2	1	5.9	0	0	3	1.7
Industry	Accommodation/Cafes/Restaurants	18	4.5	0	0	0	0	6	3.3
	Primary/Utilities	15	3.7	0	0	0	0	8	4.4
	Construction	32	8.0	0	0	0	0	6	3.3
	Education/Cultural/Recreation Services	23	5.7	0	0	0	0	10	5.6
	Finance/Insurance	45	11.2	6	35.3	0	0	17	9.4
	Health/Community Services	32	8.0	1	5.9	0	0	7	3.9
	IT/Communications	36	9.0	4	23.5	2	66.7	32	17.9
	Manufacturing/Mining	38	9.5	0	0	0	0	26	14.4
	Personal/Other Services	27	6.7	1	5.9	0	0	6	3.3
	Property/Business Services	46	11.4	5	29.4	0	0	7	3.9
	Retail Trade	38	9.5	0	0	0	0	10	5.6
	Transport/Storage/Logistics	17	4.2	0	0	0	0	13	7.2
	Wholesale Trade	24	6.0	0	0	1	33.3	18	10.0
	Multiple from above	11	2.7	0	0	0	0	14	7.8

Technology adoption varies by industry (Walsh et al., 2021), and client preferences may inhibit or encourage innovation (Krieger et al., 2021).

Organisation size can influence adoption, with larger firms often found to be faster adopters than smaller entities (Raguseo, 2018; Rosli et al., 2013; Tarmidi et al., 2014). However, Lowe et al. (2018) found that take-up in the Big Four has been comparable to that in other organisations in accounting.

2.3. Strategies to support adoption

Roos (2015) highlighted the importance of organisations recognising the value of technology for evidenced improvements in productivity and organisation growth. CPA Australia (2021b) emphasised how a digital transformation strategy can help organisations understand how technology is supporting their strategic objectives and to ensure it is aligning with client needs and organisational culture. Another known strategy to support adoption is building staff awareness, at all levels, of the benefits of technology. This may be achieved through internal champions, budgets dedicated to technology and campaigns to demystify unfamiliar technologies (Jackson et al., 2022a). Davern et al. (2019) asserted the importance of the profession remaining abreast of technological developments, possibly through collaborating with specialists (Krieger et al., 2021), while Raguseo (2018) emphasised extending current staff capability through training or recruitment. Walsh et al. (2021) accentuated the role of governance and regulation, highlighting the need for timely and effective communication between organisations and governing bodies. Earlier work (Jackson et al., 2022a) observed the interplay between TOE factors and strategies designed to overcome them.

3. Methodology

3.1. Participants

A total of 602 accountants in managerial roles (proprietor, director, or senior, executive or middle manager) participated in the study. Of these, 422 worked in Australian organisations, representing all states and territories, and 180 in South-East Asia, with 26 from Hong Kong and 154 from Singapore. Table 1 summarises the characteristics of those who took part in the online survey (n = 582), the virtual interview (n = 17) or both (n = 3). Gender was reasonably uniform across the geographic samples. Only Australians took part in the interviews, and the majority of participants were male. In both regions, most participants were based in the private sector, with greater representation from small or medium-sized businesses in Australia and larger organisations in South-East Asia. A diverse range of industries were represented, with some differences by region.

3.2. Procedures

A third-party survey panel provider recruited the eligible participants with an agreed sample of at least 550 accounting managers from Australia and South-East Asia. Eligibility criteria were: first, being a professional accountant in a managerial role in an accounting organisation or an accounting work area/department within an organisation based in another industry or sector (see Table 1) and, second, being in Australia, Singapore or Hong Kong. The survey panel provider sought representation from all Australian States and Territories. Once ethics approval was granted, eligible participants were invited to complete an online survey in June 2021. Australian survey participants were asked to take part in a follow-up interview, with three volunteering. The research team reached out via email or LinkedIn messages to invite professional contacts for the remaining 17 interviews with purposive sampling, ensuring representation from both the eastern and western states of Australia. The team conducted interviews between July and September 2021 with interviewees not known to the interviewer. Interviews lasted approximately 45 min, were audio and video recorded and were transcribed using dedicated software with transcripts and recordings crosschecked by the interviewer.

3.3. Measures

As part of survey instrument development, a small sample of industry representatives piloted the survey, resulting in minor alterations to improve clarity and flow. Participants first responded to questions on demographic and work characteristics. Organisation size groupings were defined by employee number (Australian Bureau of Statistics, 2022). For context, survey respondents were provided with definitions for CRM, ERP, RPA, blockchain and AI, with cloud-based technology incorporated into each, as examples of technology.

For the first research question (factors influencing technology adoption), respondents rated the extent to which they agreed that each TOE item was important to their organisation for adopting technology (five-point scale; 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). TOE measures were identified from in-depth reviews of the framework over time (e.g., Baker, 2012; Cruz-Jesus et al., 2019; Gangwar et al., 2014). More specifically, items for Technology were adapted from Oliveira et al. (2014) except for technology competence items, which were derived from Al-Somali et al.'s (2010) seven items. The sources of Organisation items were: top management support (Oliveira et al., 2014), firm size (Australian Bureau of Statistics, 2022), staff support (Gutierrez et al., 2015; Tripopsakul, 2018), organisational support (Schmidt et al., 2020), and technology orientation (Al-Somali et al., 2010). Finally, items within the Environment dimension were adapted from Oliveira et al. (2014). Item adaptations comprised only minor changes to reflect the broader adoption of technology (rather than a specific type).

For the second research question (barriers that inhibit adoption), survey respondents provided an open response on any barriers

Table 2
Bivariate correlations between dimensions of TOE framework (survey, $n = 585$).

	α	SC	Cost	RA	Compatibility	TC	MS	SS	OS	TO	CP	RS
Technology												
Security concerns	0.85	1										
Cost savings	0.73	0.305**	1									
Relative advantage	0.86	0.416**	0.591**	1								
Compatibility	0.85	0.340**	0.587**	0.696**	1							
Technology competence	0.75	0.236**	0.451**	0.530**	0.595**	1						
Organisation												
Top management support	0.82	0.292**	0.416**	0.534**	0.600**	0.535**	1					
Staff support	0.86	0.237**	0.469**	0.556**	0.637**	0.624**	0.695**	1				
Organisational support	0.89	0.294**	0.402**	0.529**	0.593**	0.613**	0.667**	0.716**	1			
Technology orientation	0.87	0.208**	0.424**	0.437**	0.603**	0.593**	0.654**	0.646**	0.603**	1		
Environment												
Competitive pressure	0.76	0.289**	0.459**	0.487**	0.548**	0.471**	0.549**	0.484**	0.434**	0.594**	1	
Regulatory support	0.82	0.146**	0.435**	0.383**	0.502**	0.455**	0.433**	0.523**	0.424**	0.551**	0.519**	1

** $p < 0.01$ level (2-tailed).

beyond the TOE items. Further, interviewees considered their organisation's main barrier or challenge to adopting technology. For the third research question (strategies to manage barriers), survey respondents rated the importance (five-point scale, 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important) of six strategies identified in the literature as supporting the adoption of technology. They were also invited to share any additional strategies in an open response question. Interviewees considered what strategy (or strategies) was used to overcome the barrier they had identified and why?

3.4. Analysis

Means and standard deviations were computed for the TOE items' importance for technology adoption. Bivariate correlations were calculated to assess convergent validity and to understand any associations between the different TOE factor dimensions. One-way multivariate analysis of variance (MANOVA) with Tukey post-hoc analysis was used to explore variations in TOE factor dimensions by organisation size, sector and region. Means and standard deviations were also calculated for the six strategies for supporting technology adoption. One-way analysis of variance (ANOVA) with Tukey post-hoc analysis identified any differences in survey responses by organisation size, sector and region.

The research team conducted thematic analysis at an individual-response level according to the process outlined by Braun and Clarke (2006). Using Microsoft Excel, common themes were identified in survey open responses on barriers to adoption and strategies to overcome these barriers. The team used inductive coding and developed a framework of themes and associated subthemes (where applicable); these were crosschecked among members. They then coded individual responses against the framework, recoding respondent numbers and illustrative quotations. Interviewee responses on the main barrier their organisation experienced in adopting technology were deductively coded against the TOE framework, while strategies employed to overcome these barriers were inductively coded. The team developed one framework of themes, given the close similarities between the coding scheme for the open survey responses on additional strategies to overcome barriers and the interview responses. Supporting quotations are denoted with I for interviewee, A for Australian survey respondent and SEA for South-East Asian respondent, followed by the respondent number.

4. Results

4.1. Importance of TOE factors for adoption

Data were first checked for normality; all variables were within the accepted thresholds of 3 and 10 for skewness and kurtosis,

Table 3
Technology-related factors for adopting technology (survey, $n = 585$).

	All		Australia		SE Asia	
	M	***SD***	***M***	***SD***	***M***	***SD***
Security concerns	3.97	0.892	3.90	0.934	4.13	0.768
Degree of organisation's concern with data security for new technology	3.99	0.854	3.92	0.885	4.14	0.761
Degree of concern for customers with data security for new technology	3.94	0.898	3.86	0.941	4.14	0.761
Degree of concern about privacy for new technology	3.98	0.923	3.93	0.975	4.11	0.783
Cost savings	3.63	0.963	3.61	0.964	3.67	0.957
Benefits of new technology are greater than costs of adoption	3.84	0.915	3.80	0.930	3.93	0.875
With new technology there is a reduction in energy costs and environmental costs	3.62	0.916	3.59	0.915	3.69	0.916
Maintenance costs of new technology are very low	3.42	1.057	3.43	1.048	3.39	1.081
Relative advantage	3.91	0.803	3.90	0.819	3.94	0.767
New technology allows business operations to be managed in an efficient way	3.91	0.811	3.90	0.828	3.94	0.771
The use of new technology improves the quality of operations	3.90	0.805	3.92	0.813	3.87	0.787
Using new technology allows specific tasks to be performed more quickly	3.88	0.779	3.87	0.789	3.91	0.757
The use of new technology offers new opportunities	3.92	0.820	3.88	0.838	3.99	0.777
Using new technology allow business productivity to be increased	3.96	0.801	3.93	0.825	4.02	0.744
Compatibility	3.72	0.871	3.69	0.881	3.80	0.843
New technology fits with work style of the organisation	3.71	0.843	3.68	0.867	3.77	0.783
New technology is compatible with current business operations	3.75	0.857	3.72	0.864	3.81	0.838
New technology is compatible with organisation's corporate culture and value system	3.74	0.876	3.69	0.880	3.86	0.860
New technology is compatible with existing hardware and software	3.70	0.906	3.66	0.912	3.77	0.890
Technology competence	3.68	0.966	3.70	0.957	3.64	0.983
Organisation has individual(s) with 'expert' knowledge of information technology	3.59	0.981	3.60	0.974	3.57	0.998
Organisation has sufficient financial resources to implement new technology	3.58	0.999	3.57	0.974	3.59	1.055
Organisation has individual(s) who could plan and carry out various parts of the evaluation procedure	3.65	0.932	3.67	0.887	3.60	1.028
Most of staff have unrestricted access to computers and the internet	3.68	1.029	3.69	1.037	3.64	1.012
Most of staff are computer literate	3.90	0.890	3.95	0.915	3.79	0.824

respectively (Kline, 1998). Common method bias was investigated using Harman's single-factor test (Podsakoff et al., 2003). Results indicated no concerns: the one-factor solution explained 38.9 % of the variance, and a seven-factor solution emerged for all variables, accounting for 63.6 % of the variance. With respect to validity and reliability, principal components analysis confirmed that each TOE factor was unidimensional, and Cronbach alpha scores for dimensions within each factor were all above the widely accepted threshold of 0.7 (see Table 2). Strong, positive bivariate correlations between items measuring the Organisation and Environment factors confirmed convergent validity, while inter-item correlations were moderate to strong for Technology.

Interpretation of the magnitude of associations between the TOE factors drew on Cohen's (1988) effect sizes, with 0.10 being small, 0.30 moderate and 0.50 strong. Relative advantage, compatibility and technology competence within Technology observed strong, positive correlations with the different Organisation factor dimensions. Also positive were both cost and security concerns, which observed significant correlations but of a lesser magnitude. With respect to correlations between the Technology and Environment factors, there were moderate to strong correlations between dimensions apart from security concerns, which again were smaller in size. Moderate to strong positive correlations were also reported for the different aspects of Organisation with Environment. No negative or insignificant correlations ($p < 0.01$) were reported across the factor dimensions.

Table 3 summarises the means and standard deviations for participants' level of agreement with different Technology dimensions. Results show that security and privacy concerns are clearly important for adoption, particularly in South-East Asia. Strong perceptions of the relative advantages of adoption were also important, with respondents from both regions recognising the value of gains in efficiency, productivity, quality and growth opportunities as enablers of adoption. Less important was the degree of compatibility with current operations, systems and culture and the respondents' organisation's technological competence in terms of expertise, infrastructure and financial resourcing. Interestingly, the lowest composite average score was for cost savings, although this still approached the 'agree' rating marker. Benefits outweighing the costs of adoption was recognised as the most important item among respondents, and maintenance costs the least.

Table 4 shows the mean ratings and standard deviations for Organisation dimensions. Although marginally lower than security concerns and relative advantage gains within Technology, top management, staff and organisational support were considered important for adoption. Participants considered their organisations' technological orientation, or openness to technological change, of less importance, including cost savings from the Technology cluster. At the item level, respondents emphasised management support for implementing technology; providing staff with support, resources, training and development; and appreciating the strategic value of technology to the business. In contrast, they assigned relatively lower scores to willingness to take risk, experimentation with technology, technological forecasting and remaining abreast of technological change.

Managers' average scores for Environment (see Table 5) were marginally lower compared to most Technology and Organisation dimensions, aligning more with cost savings, technological competence and technological orientation. While they recognised competitive advantage as important, they assigned lower ratings to pressure from competitors and the existence and information on regulations and laws related to technology.

4.2. TOE factors by organisation type and region

For the MANOVA ($\alpha = 0.05$) on the TOE factors (see Table 6), it made conceptual sense to explore variations at the factor level given

Table 4
Organisation-related factors for adopting technology (survey, $n = 585$).

	All		Australia		SE Asia	
	M	***SD***	***M***	***SD***	***M***	***SD***
Top management support	3.75	0.927	3.73	0.957	3.80	0.854
Management supports the implementation of new technology	3.89	0.865	3.87	0.901	3.93	0.777
Top management provides strong leadership and engages in information systems process	3.77	0.909	3.75	0.941	3.81	0.833
Management is willing to take risks involved in the adoption of new technology	3.59	1.006	3.56	1.029	3.66	0.953
Staff support	3.78	0.912	3.79	0.900	3.74	0.940
Staff enthusiastically support the adoption of new technology	3.69	0.962	3.69	0.947	3.69	0.998
Staff have adequate know-how on how to adopt new technology	3.74	0.911	3.76	0.890	3.70	0.957
Staff believe that new technology has potential strategic value for the business	3.81	0.861	3.82	0.844	3.78	0.900
Adequate training and education are given to staff to adopt new technology	3.86	0.913	3.88	0.918	3.81	0.904
Organisational support	3.82	0.875	3.83	0.904	3.81	0.806
Organisation provides staff guidance on how to change to the new way of working with new technology	3.79	0.865	3.80	0.879	3.77	0.833
Organisation provides staff the necessary help and resources	3.84	0.887	3.82	0.916	3.87	0.819
Organisation gives the necessary support and assistance	3.83	0.874	3.85	0.918	3.78	0.766
Technology orientation	3.49	1.024	3.47	1.020	3.55	1.033
Policy of the organisation has been to always consider the most up-to-date available technologies	3.57	0.991	3.55	0.983	3.62	1.009
Organisation has a long tradition of attempting to try out new systems, applications, methods, and equipment	3.49	1.015	3.45	0.998	3.59	1.050
Organisation devotes extra resources (i.e., time, money) to technological forecasting	3.41	1.066	3.40	1.078	3.43	1.041

Table 5
Environment-related factors for adopting technology (survey, $n = 585$).

	All		Australia		SE Asia	
	M	***SD***	***M***	***SD***	***M***	***SD***
Competitive pressure	3.68	0.935	3.63	0.973	3.79	0.835
Organisation thinks that new technology has an influence on competition in their industry	3.73	0.876	3.67	0.909	3.88	0.779
Organisation is under pressure from competitors to adopt new technology	3.50	1.055	3.45	1.104	3.61	0.930
Organisation understands the competitive advantages offered by new technology in its industry	3.80	0.874	3.77	0.905	3.86	0.796
Regulatory support	3.55	0.929	3.52	0.928	3.63	0.808
There is legal protection in the use of certain new technologies	3.65	0.926	3.62	0.922	3.72	0.934
The laws and regulations that exist nowadays are sufficient to protect the use of new technologies	3.53	0.921	3.50	0.908	3.59	0.950
Information about laws and regulations related to new technologies is sufficient	3.48	0.940	3.44	0.954	3.58	0.902

that the positive inter-item correlations were moderate to strong, aligning with Maxwell's (2001) recommended use of MANOVA. Pillai's trace (P) statistic was used given some significant Box tests and its recognised robustness to heterogenous variances among dependent variables (Finch, 2005). The significant MANOVAs showed differences in each TOE factor by organisation size, while variations by sector were limited to Organisation and Environment and regional differences to Technology. Notably, the Pillai's trace for organisation size was closer to one than for region and sector, suggesting this has a greater statistically significant effect on the TOE factors.

Significant univariate results are summarised in Table 7. Given the exploratory nature of the study, Bonferroni corrections were not applied. Results show significant variations by organisation size for all five Technology dimensions. Tukey post-hoc analysis ($\alpha = 0.05$) revealed that large organisations reported significantly higher average scores for security concerns than both small and medium-sized businesses. For cost savings, compatibility and technological competence, small businesses reported significantly lower average ratings than both medium and large organisations and a significantly lower average for relative advantage compared to only large organisations. With respect to region, the South-East Asian managers reported significantly higher average ratings for security concerns than those in Australia.

Regarding Organisation dimensions, smaller businesses reported significantly lower average scores than medium and large organisations for both management support and technological orientation. For sector, not-for-profit organisations assigned lower scores for technological orientation compared to those based in both public and private sectors. Finally, for Environment, smaller businesses rated competitive pressure and regulatory support lower than both medium and large organisations. Again, not-for-profit respondents gave lower ratings for both Environment dimensions compared to those from private and public organisations.

4.3. Qualitative analysis of barriers to adoption

Survey participants' open responses and interviewee commentary on the main barrier in their organisation focused on Technology or Organisation factors, with no mention of Environment. For Technology, five interviewees noted *cost* as the most important barrier, largely related to implementation (e.g., hardware, upgrades and licensing), costs of transitioning to newly adopted technology (e.g., lost billable hours) and maintenance. One considered *compatibility* the main barrier: 'we have different clients from different industries … identifying how we can make the tool work for all is time-consuming' (I7).

Interviewees discussed Organisation-related barriers at length, with two noting *management support* as important. One advocated that leaders creating change within organisations, such as through automation and digitisation, was more pertinent than managerial support for implementing technology: 'leadership is around creating a culture that says "this is important, this is where we're headed, this is where we're changing and I need everybody to be on board" … leadership has to actually create this kind of change, not just a manager trying to implement it' (I20).

Nine interviewees' comments on *staff support* related to resistance to learning technologies, staff's ability to learn in a timely manner and training staff without interrupting normal work processes. Some noted the difficulties of older staff embracing and

Table 6
Significant MANOVAs for variations in TOE factors.

Factor	Variable	Between groups df	Within groups df	F	Pillai Trace (P)	*p*-value	η^2
Technology	Organisation size	10	1158	4.325	0.072	<0.001	0.036
	Region	5	579	3.822	0.032	0.002	0.032
Organisation	Organisation size	8	1160	5.525	0.073	<0.001	0.037
	Sector	8	1160	2.998	0.041	0.002	0.020
Environment	Organisation size	4	1164	8.958	0.060	<0.001	0.030
	Sector	4	1164	3.097	0.021	0.015	0.011

Table 7
Univariate analysis for variations in TOE factors.

Factor/ variable	Dimension	df	MS	F	*p-value*	η^2
Technology: Organisation size	Security concerns	2	4.399	7.338	<0.001	0.025
	Cost savings	2	8.414	14.517	<0.001	0.048
	Relative advantage	2	1.780	4.321	0.014	0.015
	Compatibility	2	3.560	6.907	0.001	0.023
	Competence	2	3.180	6.891	0.001	0.023
Technology: Region	Security concerns	1	6.454	10.713	0.001	0.018
Organisation: Organisation size	Management support	2	5.078	8.152	<0.001	0.027
	Technological orientation	2	11.558	14.568	<0.001	0.048
Organisation: Sector	Technological orientation	2	4.509	5.515	0.004	0.019
Environment: Organisation size	Competitive pressure	2	9.864	17.450	<0.001	0.057
	Regulatory support	2	5.350	8.657	<0.001	0.029
Environment: Sector	Competitive pressure	2	2.646	4.484	0.012	0.015
	Regulatory support	2	3.107	4.966	0.007	0.017

adapting to technology, and others mentioned staff may feel threatened by technology replacing their roles. One interviewee reflected on the role of *organisation size*, noting the challenges of communicating the process and value of technology to staff in his larger organisation compared to smaller companies he had worked for. *Organisational support* and *technological orientation* were mentioned by two interviewees. For example, 'we're not necessarily thinking of how data and technology is changing the world around us. Sometimes we focus on everyday things rather than what's going to completely disrupt us in the near future … from a cultural point of view, a lot of firms in the mid-tier sector don't have the resources to have people involved in thinking about new technology' [I4].

Survey respondents' open comments revealed two additional factors beyond the TOE measures that could impact adoption. First, *procurement*, with 15 Australians and five South-East Asian respondents observing the challenges of having the knowledge and information to source the 'right' system for their organisation. Second, five Australians and two South-East Asian managers lamented *time* for adoption as problematic: 'the time taken to learn the new systems and work out how it works and how it will work in your company' (A251).

4.4. Strategies to support adoption

Table 8 summarises the means and standard deviations for strategies considered important for driving technology adoption in ascending order. Results show the critical importance of developing staff capability, followed closely by dedicated financial resources to support adoption. Participants also recognised the value of securing senior management and staff support, as well as in-house IT experts to drive adoption. Respondents, particularly those in Australia, attributed less importance to implementing organisational processes that support adoption.

ANOVA ($\alpha = 0.05$) results show no significant variations in mean ratings by sector, yet differences were detected by organisation size for senior management support, $F(2,582) = 8.001$, $p < 0.001$; staff support, $F(2,582) = 3.602$, $p = 0.028$; in-house IT expertise, $F(2,582) = 6.585$, $p = 0.002$; organisational processes, $F(2,582) = 8.742$, $p < 0.001$; and dedicated financial resources, $F(2,582) = 3.772$, $p = 0.024$. Post-hoc analysis revealed that smaller organisations assigned significantly lower mean scores than both medium and

Table 8
Strategies to support technology adoption (survey, n = 585).

Strategy	All		Australia		SE Asia	
	M	*SD*	*M*	*SD*	*M*	*SD*
Developing staff capability for the adoption of new technology	4.11	0.846	4.10	0.909	4.13	0.686
Dedicating finances/budgets to support the adoption of new technology	4.08	0.863	4.03	0.929	4.20	0.680
Securing executive or senior management (including CFO) support for the adoption of new technology	3.98	0.893	3.90	0.957	4.18	0.694
Securing staff support for the adoption of new technology	3.97	0.937	3.96	0.964	4.01	0.875
Securing the support of in-house information technology experts for the adoption of new technology	3.89	0.937	3.83	0.977	4.02	0.829
Implementing organisational processes that support the adoption of new technology	3.71	1.023	3.62	1.094	3.92	0.808

large organisations, other than for staff support and financial resources, where they differed only compared to large organisations. There were also some differences in adopted strategies by region, identified through independent samples *t*-test ($\alpha = 0.05$). Significant results were reported for senior management support, $t(583) = 3.553$, $p < 0.001$; in-house IT expertise, $t(583) = 2.176$, $p = 0.015$; organisational processes, $t(582) = 3.327$, $p < 0.001$; and dedicated financial resources, $t(583) = 2.243$, $p = 0.013$. In each case, the Australian sample reported a lower mean than the sample from South-East Asia.

The eight themes from open survey responses and interview transcripts on successful strategies to support adoption (and/or overcome certain barriers) are summarised in Table 9.

4.4.1. Training and development

This theme related to multiple barriers across the TOE factors. Participants emphasised the value of formally training staff prior to adoption and helping to build staff confidence and requisite skills and suggested staff meetings with touchpoints on technology, webinars, roadshows, instructional modules and individualised, bespoke training. Participants emphasised making the training practical and interactive and supported by a staged approach—such as using instructional videos, followed by time for staff to practise working with the technology—rather than multiple-day workshops without sufficient time for authentic practice. Further, participants highlighted the need for ongoing and continued support when adopting technology, not just at the implementation stage.

Some emphasised the value of bringing in external experts, often software vendors, to support initial training, although sourcing experts was noted as challenging and training internal team leaders and/or IT champions to deliver training was considered more sustainable. Some thought bespoke training solutions were valuable yet expensive, and many opted for standardised modules for training staff and upskilling champions/leaders, with some support from software vendors.

Several participants promoted the use of champions and IT experts for peer support and buddy systems, enabling a staged rollout across different sites and business lines. One advocated for a champions group, comprising individuals from different work areas who

Table 9
Interviewee and survey respondents' perceptions on strategies for successfully adopting technology.

Strategy	AU	SEA	I'view	Illustrative quotation
Training and development				
Formal training	57	21	11	'Providing training and clearly communicating the benefits to staff to ensure staff engagement and uptake'. [A244] 'Training is really important, and you need to train often and train well. If the training is not applied in a practical way within six days then 75 % of what you've learned is lost forever, so it is absolutely useless' [I11].
Champions/IT experts	8	7	10	'Having good, engaged team leaders is the most important element of success.' (I6)
Engaging staff				
Building awareness	33	16	11	'Creating a reason and a vision and being clear about the objectives and the value of the technology is important.' (I20)
Usage/ experience	9	5	5	'Start, rather than end, with the user experience. If you look at the software development lifecycle, it's all about technology, technology, technology, and then, after, it comes to user experience. Reverse and first let people use it; then you can use the analytics and see what's more popular, what works and what does not work.' (I8)
Innovative mindset	4	2	0	'Foster innovation capabilities through transformation and community practice.' (SEA578)
Incentives	4	13	0	'Incentivise staff for constructive feedback and ideas to improve efficiency and productivity through technology adoption.' (SEA512)
Project management				
Using consultants	8	3	0	'Bringing in a team and brainstorming on what our hurdles are and talking through solutions.' (A282)
Change management	3	1	3	'Ensuring adequate change management experts are involved in the planning and delivery.' (A206)
Internal collaboration and feedback	4	1	1	'We seek feedback after a relevant period of time, refining things to address feedback and then moving forward so we are continually improving.' (I15)
Effective implementation	25	5	6	'Project management, which means you need some honest, timely checkpoints along the way and having people in the team who have enough knowledge and common sense and judgement to call out when something doesn't look right.' (I13)
Systems and infrastructure	27	29	3	'At the time of implementation, our computers were getting old and slow, and the firm said, "it is not going to work well with the hardware that you've got". We upgraded and, yes, it was a lot of money, but it was well worth it.' (I1)
Staying informed	24	6	2	'Subscribing to appropriate news sources to track new technology developments and the success or otherwise of those products.' (A245)
Trialling technology	19	2	9	'Trial different innovative software through free sign up.' (A372)
Support				
Internal support	10	1	1	'Adequate technical support for end users.' (A395)
External support	3	0	1	'We utilise a partnership model, where we use support delivery services to support in-house functionality and application of new technologies.' (A211)
Management and strategy				
Management buy-in	3	2	2	'Any change management starts by educating and getting the leaders on board. If the partners are not on board, then it doesn't trickle down right to the grads or analysts who are implementing the tool.' (I7)
Strategy	4	8	7	'Maximise government grants and subsidy to increase adoption of technology' (SEA529)

were actively involved in different stages of adoption, becoming 'the flagbearer of the product in the early stages to the rest of the users' (I8). Another commented on the importance of intensively training champions so they can understand how the technology could be integrated seamlessly into existing systems, manage emerging issues and provide feedback to foster continuous improvement. Interviewees emphasised how champions needed a growth mindset and the role of human resource professionals in identifying staff who were open-minded and had a passion for technology adoption and transformational change.

4.4.2. Engaging staff

Both interview and survey responses emphasised the importance of building staff awareness of the purpose and value of technology, particularly communicating benefits to encourage engagement. Participants highlighted key benefits as improved efficiency, enhanced security, reduced workload, increased organisational agility and the potential for flexible, remote working. One emphasised the importance of providing reasons for technology adoption other than cost savings, which may not inspire staff. Participants felt that raising awareness of personal benefits was important, such as greater enjoyment in roles, strengthening skill bases and gaining experience in technology-related systems for future careers. Ensuring technology was fit for purpose in terms of usability and functionality was critical for engagement and gaining staff confidence.

Participants discussed communication platforms with reliance on emails flagged as problematic, with some advocating face-to-face sessions for clearer explanations of technology adoption, including rollout intentions and making staff feel part of the decision-making process. One interviewee noted, 'awareness often comes with a kick-off event because people can get their head around something happening on a particular date' (I20). Others advocated for short, digestible videos with links to training elements, rather than synchronous events, to allow people to engage at their chosen time. Others highlighted how technology vendors can incite interest and excitement among staff to encourage mental and psychological buy-in and manage any resistance to change. Once technology was 'out there', several felt word of mouth among staff users was highly effective.

Participants also felt that that encouraging staff to access technology quickly, use it and provide feedback was important. One interviewee stated, 'I think the key part around adoption is putting it in the hands of the user. If the user gets to touch and feel and experience the ease of use, sees the immediate benefits, then you know that you get that immediate buy-in' (I14). More generally, survey respondents recognised the benefits of fostering innovative capabilities, open-mindedness and a growth mindset to enable technology adoption. Incentivising staff to engage with technology was most prevalent among the South-East Asian survey responses.

4.4.3. Project management

Participants mentioned project management when discussing barriers related to Technology (costs and resourcing), Organisation (staff and management support) and Environment (clients/competitors). There were differing views on best practice in implementing technology adoption. Smaller organisations seemed more supportive of a full and fast rollout across the business, while medium and large organisations favoured either progressive and staged deployment or the initial use of pilot sites followed by full deployment. The phased approaches mean 'you are not putting the whole firm in jeopardy with a big bang, and you are learning from each particular rollout' (I20). Managers observed that rollout stages have become condensed, given technology is largely cloud-based and there are limited physical infrastructure requirements, and are largely managed in house.

Participants identified some key enablers associated with technology-related projects. First, they are best approached as a form of change management with relevant internal stakeholders in place for support. Second, a project lead/manager is critical, along with an appropriately skilled project team, such as a CFO, IT manager, an accountant and others passionate about technology. Third, sufficiently planned implementation and support from leadership. Fourth, a realistic timeline, including milestones and regular checkpoints to evaluate progress. Finally, internal collaboration and feedback on the project for continuous improvement.

4.4.4. Other

Many survey respondents recognised the need for quality *systems and infrastructure* to enable seamless integration of technology, including wi-fi, hardware, cloud-based software, and data storage. They also emphasised *staying informed* by, for example, 'scanning the environment' for new technological developments. Some had teams dedicated to forecasting technological change and opportunity, enabling organisations to plan new technology projects in line with budgeting and expenditure processes. Several participants recognised the value of *trialling technology*, using dummy versions to enhance familiarity, assess the potential value added and understand how the technology could be embedded into workflows and processes. One stated, 'I literally got to the point where I said I need to see something. I need to be able to have my team play with it' (I14).

Managers also emphasised *support* for overcoming barriers to technology adoption, both in-house (e.g., running new and existing systems in parallel until full technology implementation is ready) and external (e.g., technology vendors and experts). External experts might be contracted to resolve compatibility and legacy issues, particularly in smaller organisations that may lack specialist IT staff. Finally, the *management and strategy* theme encompassed securing management buy-in, which is critical for engaging staff at the grassroots level, and implementing innovative technology-related strategies. Such strategies span the wider business environment, competitors and the organisation's business cycle and include leveraging government or other funding for technology solutions and navigating labour laws.

Interviewees shared several ways of evaluating the success of strategies for adopting technologies. These included measuring improvements in accuracy, productivity or efficiency in processes impacted by the technology; assessing compliance with new processes; gathering statistics relating to client and staff adoption; and obtaining feedback from staff on the ease-of-use and value of technology. Most of their organisations set clear project milestones to evaluate the progress of adoption; only one indicated that a formal evaluation process was not in place.

5. Discussion

Correlations among the TOE factors provide some interesting insights and support earlier studies (Oliveira and Martins, 2011). They showed that if managers felt that the value of technology was understood, that it fitted with work style and values and that their organisation had sufficient expertise and resources for implementation, there was more likely to be staff, management and broader organisational support, as well as an overall orientation towards introducing technology. This highlights how the more human and cultural aspects of the Technology factor correspond with Organisation factors. It made sense that if managers considered that regulatory support and competitive pressures affected their organisation's adoption of technology, there was more management support and technology orientation, as these external factors engender a culture of technological change. Findings also highlighted how security concerns, and to a lesser extent cost savings, behaved, to a relatively high degree, in isolation from other factors. This corroborates the qualitative finding that staff are not particularly inspired by cost savings as a sole motivator for embracing technology and that other factors need to be apparent. In essence, for most of the dimensions, stronger ratings in that dimension are likely to be reflected in higher scores in another, culminating in a collection of powerful enablers to adoption. This accentuates the value of organisations taking a holistic approach to technology adoption with careful consideration of dynamic Technology, Organisation and Environment factors and how initiatives in one may create change in another.

Security and privacy issues, as flagged by others (Chatterjee et al., 2021), appear paramount for decisions on technology adoption. Ongoing, large-scale data breaches across different industries signal a critical need for stakeholders to address this global concern and for more research on how to manage this growing problem (Moll and Yigitbasioglu, 2019). Organisations must proactively resource the monitoring of emergent concerns and the implementation of risk mitigation strategies. There is also clear value in professional associations and industry bodies lobbying governments on security measures, as well as providing organisations with knowledge, resources and practical strategies for effectively managing data and privacy.

Appreciating the strategic value of technology for gaining an advantage is also key, as is giving staff the support, resources and training necessary for successfully adopting technology, with leadership from the top. This illuminates the need for widespread efforts to build awareness of emergent technologies and to support staff during implementation across functions and levels, and echoes the recommendations of others (e.g., Ediriweera and Wiewiora, 2021). This, again, highlights an important opportunity for relevant professional associations and industry bodies to showcase the use of emergent technologies and their associated benefits and provide development opportunities and other practical support for adoption, particularly for smaller organisations. This might include podcasts, webinars or seminars that provide guidance and education on what technology is available and what factors to consider when implementing technology. Establishing forums or communities of practice for sharing learning and experience may offer support as well as access to resources and training, such as micro-credentials, MOOCs and on-demand learning.

The study also illuminates a call to action for higher education institutions to ensure accounting curricula are suitable for producing graduates who have practical experience with emergent technologies, understand their purposes and uses in various workflows and contexts and have a growth mindset regarding technological innovation. The appetite for streamlining curricula to reflect contemporary practice is growing amid graduate skill gaps and global talent shortages (e.g., Damerji and Salimi, 2021; Dolce et al., 2020). Nonetheless, gaps in accounting education persist due to enduring challenges, such as crowded curricula and difficulties positioning accounting professionals as subject matter experts to deliver content in universities (see Jackson et al., 2022b). There is a clear need for case studies of best practice for developing technology-related skills and knowledge among future workers and of how professional bodies are adapting their accreditation and development processes to support technology-related skills (Moll and Yigitbasioglu, 2019).

As in earlier research (Skafi et al., 2020), in this study, costs featured in organisational decision-making about adopting technology. Although less important than other factors in the survey, cost was an important barrier among interviewees, and there is a clear need for organisations to be able to demonstrate that benefits outweigh costs. This highlights the value of technological forecasting that can predict likely outcomes of implementation as well as communities and forums where organisations can draw on the experiences of similar businesses. As observed by Ramdani et al. (2009), Environmental factors were considered less important in general. While managers indicated that organisations seek competitive advantage, pressure from competitors to introduce technology was not vitally important, which perhaps explains the lag in technology adoption in the profession. The findings nonetheless highlight the important role of governments in establishing fit-for-purpose legislation and regulation for the adoption of emerging technology, to help mitigate concerns for security and privacy. Incentivising technological innovation and encouraging organisations, particularly smaller ones, to leverage the value of emergent technologies will enable Australian organisations to keep pace with global competitors.

The complexities of organisational contexts, including resources, processes and structures, evidently influence technology adoption, and there is considerable variation by organisation size. Large organisations placed greater value on all Technology dimensions, on management support and technological orientation and on competitive pressure and regulatory support. These findings accord with earlier evidence of an overall bigger commitment to technology adoption among larger organisations (Al-Somali et al., 2010; Low et al., 2011), often due to better access to resources and greater ability to take risks (Oliveira et al., 2014). This suggests that a one-size-fits-all approach to fostering technological innovation might not be optimal and that increased tailoring of support for different organisational types is critical to the work of professional associations and the government in advancing digital transformation. Specialised businesses and vendors for supporting technology adoption may be particularly important for guiding and supporting smaller organisations through adoption processes, given their probable lack of in-house expertise (Krieger et al., 2021).

Findings indicate that technological orientation is less prominent among not-for-profit organisations, suggesting more education and training on the importance of experimentation, policy and technological forecasting is needed to incite a cultural shift and growth in adoption. Again, this highlights the role of professional associations in fostering change, particularly given the lack of purported pressure from competitors. The need for greater regulatory support for smaller businesses and those in the not-for-profit sector is

another area that may encourage technological innovation in the profession. Further, the discernible difference between Australian and South-East Asian respondents on security concerns may be attributed to culture, such as a lower tolerance of risk in Asia.

The study highlighted several strategies for successful technology adoption. In line with earlier work (e.g., Ali et al., 2021), imparting the value of emergent technology to staff is clearly critical, as is developing and supporting them in using technology and empowering experts and champions to enact transformational change. Ali et al. also found efficient project management to be pivotal for successful adoption; similarly, our study emphasised realistic timelines, effective communication, and actively addressing usability and compatibility concerns (e.g., through trials and vendor demonstrations) to manage Organisation-related barriers.

Echoing Davern et al. (2019), staying informed of technological innovation should aid adoption, again pointing to the role of professional associations and industry bodies in bringing the profession together to discuss barriers, challenges and a vision for the profession's future as a leader in technological change. Importantly, we advocate that multiple actions that traverse TOE factors are needed to enhance adoption, underpinned by an organisational strategy on technology with targeted measures and an evaluation plan. Deliberate and carefully considered adoption of a technology strategy is critical; it is recommended by CPA Australia (2021b) along with the 'normalisation' of technology among senior managers and staff to enhance a technologically oriented culture.

6. Conclusions

Through the lens of the TOE framework (Tornatzky and Fleischer, 1990), the study explored the viewpoints of more than 600 accounting managers from Australia and South-East Asia on technology adoption. Technology factors emerged as the most important in the view of these managers, with data security and privacy issues most greatly affecting adoption; this was particularly so among the participants in South-East Asia. Environment factors, such as regulatory support and competitive pressure, featured relatively less in technology-related decision-making, particularly among smaller and not-for-profit businesses. To help staff understand the advantages of technology, top management, staff and organisation support were clearly important, especially for larger organisations. Managers indicated strong support for the need to engage and support staff during technological innovation, noting the level of engagement as both an enabler and barrier to adoption; the strategies mentioned included building awareness, developing know-how, inciting enthusiasm and providing access to resources and training. Interestingly, there was some discrepancy in reported antecedents of adoption, perceived barriers to adoption and strategies used for supporting technological advance. For example, security and privacy played a critical enabling role yet featured less in strategies. Also, managers tended to place more emphasis on the operations involved in adoption, such as project management, rather than on strategy at the management level.

The study makes a number of practical contributions. First, it provides important insights into what Moll and Yigitbasioglu (2019) described as the neglected issue of the actual processes in adopting technology. These can be garnered from the rich qualitative commentary from managers on their learning of ways to effectively adopt technology in different settings. Second, exploration of the associations between Technology, Organisation and Environment-related factors highlights their dynamic nature and how strategising in one area may create momentum in another, accentuating the value of a holistic approach when driving transformational change. Third, the study identifies numerous considerations for organisations when developing strategies for technology adoption. For example, how they can best communicate how planned technology fits with existing work styles, culture, values and systems, as well as the benefits it brings beyond cost savings to the organisation.

Fourth, the notable differences in manager perceptions by organisation size, and to a lesser extent by region and sector, suggest that a relatively tailored approach to technology adoption, rather than a one-size-fits-all strategy, is more likely to be effective. For example, the development of technological competence could lead to significant investment in infrastructure, expertise and internal training for larger businesses, while smaller organisations may target external support, such as cloud-based services and professional associations, for development purposes. Fifth, the findings clarify the critical role of relevant professional associations in supporting members in identifying, leveraging and managing their organisation's enablers and barriers to adopting technology and crafting and implementing individualised strategies that stimulate a culture of technological orientation to advance change. Finally, the study affirms earlier assertions (e.g., Jackson et al., 2022b) on the need for collaboration among higher education providers, professional associations and industry and accrediting bodies to prepare new accounting professionals for technological change.

From a theoretical perspective, the study applied the TOE model to accounting and in different regions. It affirmed the importance of all three factors, although less strongly for the Environment-related dimensions, and highlighted the factors' interwoven nature and the role of context. While the study's cross-sectional design gives only a snapshot of accounting managers' perceptions at a particular time, the exploration in different regions using both qualitative and quantitative data provides a strong foundation for future studies. These may include applying the TOE model in a particular area of accounting or extending the study to compare perceptions in other regions.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

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