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UNDERSTANDING ACCOUNTING INFORMATION, QUALITY, AND OPERATIONS SUSTAINABLE DEVELOPMENT PERFORMANCE: THE MEDIATING ROLE OF DIGITAL TRANSFORMATIOkN

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Research Paper

Abstract: *An effective accounting information system allows for the seamless integration of modern digital tools into operational processes, leading to better decision-making and resource management for long-term success. The importance of decision sciences in utilising accounting data and digital technologies to promote sustainable development in organisational operations is highlighted. Therefore, the study sought to examine the comprehensibility of accounting information's influence on sustainable development performance by considering the mediating effect of digital transformation. Information was gathered by distributing a questionnaire to 384 executives from Chinese state-owned enterprises. The executives were selected using a convenient sampling technique. The study employed a quantitative research approach and utilised a cross-sectional research design. The findings of the PLS-SEM demonstrate that the quality of accounting information has a positive and significant impact on sustainable development performance and digital technology transformation. The digital transformation also has a noteworthy positive impact on sustainable development performance. Additionally, the study revealed that digital transformation plays a role in connecting the quality of understandable accounting information to sustainable development performance. This study contributes to the current body of knowledge by presenting a conceptual framework that examines the relationship between the clarity*

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of accounting information, digital transformation, and corporate sustainable development performance. This study also assists enterprises in revaluating their sustainability strategies.

Keywords: *Understandability, Accounting information quality, Sustainable development performance, Digital transformation, Second-order construct*

1. Introduction

In the ever-changing world we live in, the concept of operations sustainability has gained significant importance. This is due to its ability to implement optimisation models and strategies, resulting in responsible decision-making that aligns with the long-term well-being of society and the environment. Incorporating sustainability into operations allows organisations to tackle a range of challenges while optimising efficiency, resilience, and ethical considerations. As the understanding of sustainability progresses, businesses are recognising the importance of incorporating sustainability performance into their traditional measures of business success (Mio et al., 2022). This study, like many others, evaluates sustainable development performance by examining its social, environmental, and economic dimensions. This approach is based on the "triple bottom line" theory proposed by (Elkington, 1998). Nevertheless, there is still a lack of comprehensive research on the factors that drive enterprises' sustainable development performance.

According to Al-Dmour et al. (2023), the integrity of financial reports plays a crucial role in enhancing a firm's economic performance. Academics have observed that adopting a decision-science perspective can yield positive outcomes. Research specifically reveals that access to high-quality accounting information significantly enhances sustainability efforts. This is because accurate data enables informed decision-making, allowing organisations to effectively allocate resources, manage risks, and align their operations with sustainability goals. Another study has highlighted the importance of incorporating robust accounting practices into decision-making processes. This not only promotes transparency, accountability, and efficiency but also contributes to the long-term sustainability of organisational operations (Kalash, 2023). In their study, Boubaker and Elnahass (2024) explore the complex relationship between the quality of accounting information and sustainable performance. They provide valuable insights into this interconnection (Boubaker & Elnahass, 2024). Liu et al. (2024) believes that improving transparency and quality in financial reporting can have a positive impact on environmental actions and ultimately contribute to sustainability (Liu et al., 2024).

When it comes to foster decision-making, it is essential to focus on the understanding ability of accounting information. According to Beerbaum et al. (2019), it is crucial to present the information in a manner that enables users to easily access and comprehend its content. Bacha and Ajina (2020) conducted a study on the understanding ability of annual reports and their relationship to corporate social responsibility (CSR) information. The research also explored the connection between CSR and corporate functioning (Bacha & Ajina, 2020). Aldoseri and Melegy (2023) investigate the relationship between the comprehensibility of annual reports, informal efficiency, and stock liquidity. There is a limited amount of research that

explores the connection between information comprehensibility and corporate sustainability development performance. Accordingly, the first research question is: Is there a positive effect of understanding ability of "accounting information quality" on sustainability of the corporate development performance?

Digital transformation is one of the factors that contribute to the enhancement of enterprise sustainable development performance (Li, 2022). Businesses or firms adopting digital technologies to change their business model and operational procedures, converting physical processes into digital ones (Tavoletti et al., 2022). In their study, Xu et al. (2023) explore the impact of digital transformation on eco-innovation and sustainability practices in Chinese production firms (Xu et al., 2023). Zhang et al. (2022) assess the influence of digital transformation on business sustainability within the context of Industry 4.0 (Zhang et al., 2022). Both authors have highlighted the positive impact of digital transformation on corporate performance and sustainability.

However, the literature also contains conflicting perspectives. Chen and Hao (2022) discovered that specific attributes of boards of directors can hinder the relationship between digitalization and ecological results, suggesting that not all aspects of digital transformation contribute to sustainability. Ji et al. (2023) investigate the role of operational efficiency and innovation as mediators in the relationship between digital transformation and sustainability outcomes. Their findings indicate that not all digital transformation initiatives result in positive sustainability outcomes (Ji et al., 2023). Digital technologies offer numerous options for enhancing environmental sustainability. One example is about the application of big data analytics to improve resource management and reduce waste, along with the use of the Internet of Things (IOT) to monitor environmental variables in real-time (Li, 2022). Adopting these technologies can significantly reduce a firm's environmental impact. Consequently, the second research question is: Is there a positive effect of digital transformation on sustainability of the corporate development performance?

Prior research has explored the influence of digital transformation on the integrity of accounting information. For instance, Wang (2023) investigates the impact of digitalization on the transparency of accounting information, highlighting the potential for digital initiatives to enhance the quality and transparency of accounting information (Wang, 2023). However, little literature has examined the influence of "accounting information quality" and its characteristics on digitalization, and to fill this research gap, the third research question is: Is there a positive effect of understanding ability of "accounting information quality" and digitalization transformation? Many studies examining the factors influencing the sustainability of corporate development performance incorporate digitalization as a moderating variable. For instance, Nayal et al. (2022) investigate the influence of sustainability strategies on the business performance of sustainable supply chains, specifically focusing on the moderating role of digitalization (Nayal et al., 2022). This study seeks to address the lack of research on the role of digitalization as a mediating factor in the relationship between accounting information clarity and corporate performance sustainability, based on this, the fourth research question is: Is there a mediating impact of digitalization between understanding ability of "accounting information quality" and sustainability of the corporate development performance? Moreover,

previous studies have primarily focused on other fields and have paid little attention to operations research and decision sciences, particularly in the context of Chinese state-owned enterprises.

China is one of the prominent emerging markets that is dedicated to the pursuit of digitalization (Li, 2020). Thus, this study aims to conduct a comprehensive survey of Chinese SOEs. Examining data from 384 Chinese SOEs provides contributions to the current literature in three areas. The paper highlights the challenges of enhancing transparency and improving the quality of accounting data to enhance the sustainable performance of Chinese state-owned enterprises. Secondly, this study investigates the mediating mechanisms that contribute to the diverse effects of digitalization on the connection between the quality of accounting information and sustainable development performance. It aims to uncover the complex role of digitalization in enhancing performance. The paper proposes a novel strategy that considers the relationship between transparency, digitalization, and environmental sustainability. The study is presented as follows: Section 2 presents the theoretical framework and hypotheses. This section will describe the methodology, specifically focusing on the collection and measurement of data. Sections 4 and 5 cover the empirical findings and analysis. The examination is presented in Section 6.

2. Theory and hypotheses

2.1 Theoretical background

This literature acknowledges that dynamic capabilities have positive effects on digitalization in the field of decision sciences (Papadopoulos et al., 2022). Firms must possess dynamic capacity to maintain a competitive advantage by identifying new niches, capitalising on opportunities, and effectively allocating internal and external resources (Bosman, 2024; Teece et al., 1997). Khadka (2023) found that businesses can maximise their benefits through digitalization by leveraging modern technologies such as websites and applications. These technologies offer real-time data on customer behaviours and habits across various industries and locations. The tool enhances the ability to identify and exploit market opportunities (Nylén & Holmström, 2015). Additionally, according to Warner and Wäger (2019), it is highly likely to implement agile responses, such as streamlining processes and required resources. Furthermore, digital technologies enable businesses to quickly obtain solutions by optimising current performance and efficiently utilising resources. The resources are being reorganised through these efforts (Mikalef et al., 2019). Digitalization refers to an employer's ability to quickly adapt and implement appropriate changes (Soluk & Kammerlander, 2021).

The role of theory-based notions in accounting is significant, particularly in analysing the impact of accounting data quality on managerial decisions and effectiveness (Libby et al., 2014). The knowledge base theory posits that organisational capacity is derived from the acquisition, integration, and effective application of knowledge (Grant, 1996; Nonaka & Takeuchi, 1995). The quality of instruction in accounting plays a crucial role in the knowledge-based theory, contributing to effective knowledge management and improved organisational

performance (Anisman et al., 2024; Wang & Clift, 2009). The understanding ability of accounting information has a direct impact on the flow and application of knowledge within a firm (Libby et al., 2014). Comprehensible accounting data facilitates information sharing, enhances awareness of the organisation's financial health and performance among management and staff, and ultimately improves resource allocation and decision-making (Alam et al., 2024; Lev, 2000). However, there are multiple challenges to enhancing the comprehensibility of accounting information. Accounting standards and reporting practices can make it challenging to interpret information (Brüggemann et al., 2013). Furthermore, the diversity of knowledge within the company and the uncertainty of the external environment can influence the level of understanding of information recipients (Tsoukas, 1996). Firms should promote the sustainability of corporate performance by digitalizing the quality of accounting information.

2.2 Understandability and Sustainability Development Performance

A significant body of research highlights the importance of the comprehensibility of ''accounting information quality ''in driving corporate sustainable development performance. The authors in Al-Dmour et al. (2023) propose that the quality of accounting information has a significant impact on business performance. They highlight the importance of factors such as comparability, relevance, faithful representation, and understanding ability in achieving this outcome. Their research emphasises the role of knowledge management procedures in this process (Al-Dmour et al., 2023). BM Ololade and AD Adekanmi explore the connection between sustainability information disclosure and financial reporting quality. They discuss the importance of accounting information and how it can affect understanding ability and corporate social responsibility (Ololade & Adekanmi, 2019). Liu and Anbumozhi (2009) propose that the availability of clear and reliable environmental accounting information can enhance sustainability practices and performance (X. Liu & Anbumozhi, 2009). According to Ojiakor (2017), having clear and easily comprehensible environmental accounting information is essential for improving the sustainability of corporate performance. In their study, Sun et al. (2022) investigate the impact of adopting "International Financial Reporting Standards" (IFRS) and "Global Reporting Initiative" (GRI) standards on the clarity of corporate reporting and the effectiveness of information for sustainable decision-making (Sun et al., 2022).

However, various scholars have presented different perspectives on the matter. For instance, Kamala (2014) offers valuable insights into the difficulties of utilising corporate environmental reports for decision-making. This suggests that the comprehensibility of these reports may not always lead to improved sustainability in corporate performance (Kamala, 2014). In their study, Helfaya and Whittington (2019) analyse the efficacy of quality measures in promoting environmental sustainability disclosure. They explore how the comprehensibility of disclosure may impact sustainability performance, shedding light on any potential limitations. Exploring the link between the comprehensibility of accounting information and the long-term success of a company, we make the following hypotheses:

H1: *There is a positive influence of understanding ability of "accounting information quality" on sustainable development performance.*

2.3 Digital Transformation and Sustainability Development Performance

In their study, Ionaşcu et al. (2022) explore the relationship between digitalization (digital transformation) and sustainable development. They propose that incorporating digital technologies can improve the overall sustainability of corporate performance (Ionaşcu et al., 2022). In their research, Xu et al. (2023) explore the relationship between digitalization, eco-innovation, and sustainable performance. They find that digital strategies and capabilities have a positive influence on corporate environmental responsibility and sustainability (Xu et al., 2023). Sun et al. (2024) investigated the impact of digitalization on CSR performance. They found that digitalization positively affects CSR performance by encouraging corporate green initiatives (Sun et al., 2024). Prior research indicates that digitalization positively impacts corporate performance and sustainability.

Some scholars have identified digitalization limitations and barriers that could impede the enhancement of corporate sustainability development performance. Marx (2022) explores the application of design thinking in digitalization, highlighting the significance of comprehending specific cause-and-effect relationships that are relevant to the context. Marx (2022) emphasises the crucial importance of overcoming barriers to continuous adaptation for successful digitalization that aligns with sustainability (Marx, 2022). Toth-Peter et al. (2023) investigate the role of Industry 4.0 technologies in enabling the adoption of circular business models and the integration of sustainability into digitalization. This study examines the environmental, social, and economic challenges associated with digitalization and its potential to promote sustainability. It offers a balanced perspective on the benefits and limitations of digitalization in this context. According to the preceding discussion, this study suggests the following hypotheses:

H2: *There is a significant impact of digital transformation on sustainable development performance.*

2.4 Understand-ability and Digital Transformation

According to knowledge base theory, comprehensible accounting information can assist management in effectively integrating knowledge across various departments and areas of expertise. This integration enables the formation of valuable insights that aid in making strategic and operational decisions for the firm (Balicka, 2023; Jones, 2024; Pearlson et al., 2024), thereby facilitating the successful implementation of digitalization (digital transformation). L. Turner, AB Weickgenannt, and M.K. Copeland explore the extensive dimensions of accounting information systems, delving into the influence of digitalization on the accounting and auditing domains. They also highlight the significance of clear and concise writing, efficient business processes, and high-quality information in promoting digitalization (Turner et al., 2020). There is still a research gap related to the impact of the clarity of accounting information quality on digitalization, so we can make the following assumption:

H3: *There is a significant impact of understanding ability of "accounting information quality" on digital transformation.*

2.5 The Mediating Role of Digital Transformation

Belhadi et al. (2022) conducted a study that investigates the impact of digital business transformation on sustainability performance. The results show that digitalization processes can change the way inner skills, like being able to understand accounting information, affect long-term results (Belhadi et al., 2022). In their study, Fernando et al. (2019) explore the concept of environmental innovation. Their research suggests that digitalization can be a valuable tool for enhancing sustainability by improving service capabilities and fostering innovation. This, in turn, may have implications for the comprehensibility of accounting information, which can serve as a basis for strategic decision-making (Fernando et al., 2019). In their study, Phornlaphatrachakorn and Kalasindhu (2021) investigate the impact of digitalization on the quality of financial reporting. They suggest that improving the quality and understanding ability of financial reporting could help drive digitalization efforts and contribute to sustainable performance. Nevertheless, there is a lack of research that specifically investigates the connection between comprehensibility and sustainability performance, with digitalization as a potential mediator. To address this research gap, we make the following hypotheses:

H4: *There is a mediating impact of digital transformation in the relationship between the understanding ability of "accounting information quality" and sustainable development performance.*

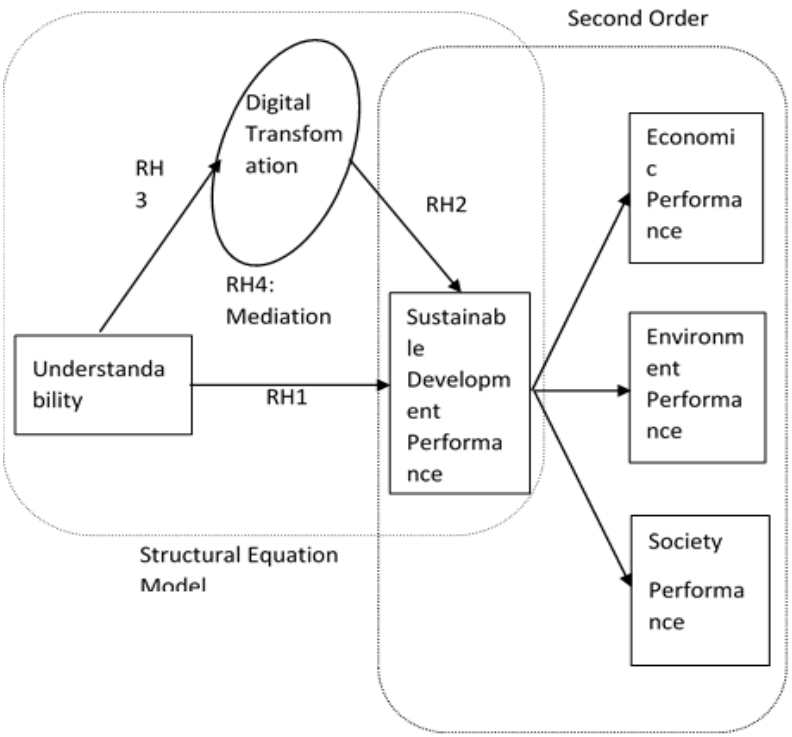

Figure 1: Conceptual Framework

After considering the arguments mentioned earlier, Figure 1 illustrates the conceptual framework of the research. Within this research framework, the clarity of accounting information and the impact of digital transformation are primary factors, while sustainability performance is a secondary factor that encompasses three dimensions: economic performance, environmental performance, and social performance. This proposed framework focuses on the area of decision sciences in operation research.

3. Methods

The study focused on examining the connection between accounting information quality and sustainable development performance among Chinese state-owned enterprises, with a particular emphasis on the mediating effect of digital technologies. For this purpose, a quantitative research approach was utilised, which is considered more suitable for conducting questionnaire-based studies compared to qualitative research methods. Furthermore, the study used a cross-sectional research design, gathering data from multiple respondents at a single point in time. The self-administered questionnaire was evaluated using a seven-point Likert scale. The collected data was analysed using SPSS and Smart PLS.

3.1 Data collections Procedures and Demographic profiles

China is currently the world's second-largest digital economy and has the largest digital consumer market globally, according to recent data (Ma, 2022; Y, 2022). Hence, the authors examined executives in Chinese state-owned enterprises. Prior to conducting formal data collection, this study recruited 20 individuals with Ph.D. degrees and expertise in sustainability performance to participate in a pilot test. The author made adjustments to the questionnaire's phrasing and estimated completion time based on feedback from the PhD participants. This study employed a convenience sampling approach during the formal data collection phase to efficiently and accurately identify Chinese companies involved in digitalization. Questionnaires were collected from executives of Chinese SOEs, including CEOs, operations managers, financial managers, and other senior executives with finance expertise. To streamline this procedure, the study utilized the data collection services offered by WenJuanxing (www.wjx.cn), a reputable technology platform and market research company that uses census data to obtain a representative sample of executives from Chinese SOEs.

The distribution of 457 questionnaires in September 2023 yielded a return rate of 89.7%, with 410 of those returned. A total of 410 questionnaires were collected, of which 384 were deemed valid, resulting in a response rate of 93.66%. A total of 384 completed responses were included in the statistical analysis. The questionnaire was divided into two sections. The initial phase of the study aimed to comprehend the comprehensibility of "accounting information quality," digitalization, and sustainable development performance, including economic, environmental, and social dimensions. The measurement scales for these constructs were derived from prior research and consisted of 24 items assessed using a 7-point Likert scale, as described in the Appendix.

The concepts of "accounting information quality" and digitalization are reflective first-order constructs. The sustainability development performance construct consists of three first-order reflective components: economic performance (3 items), environment performance (6 items), and society performance (5 items).

These components form a second-order reflective-reflective structure. The authors employed a disjoint two-stage method (Hair Jr et al., 2023) to enhance the accuracy of the model when processing the second-order variables. The second section of the survey collected demographic information from the participants, including age, gender, education level, economic district, and years of work experience. Table 1 summarises this information.

Table 1: Demographic Profile of Participants

	Frequency	Percentage
Gender		
Female	168	43.75%
Male	216	56.25%
Age Category		
<25	3	0.78%
25-34	26	6.77%
35-44	90	23.44%
45-54	102	26.56%
55-64	108	28.13%
65-74	50	13.02%
>=75	5	1.30%
Education Classification		
College and below	27	7.03%
Undergraduate	168	43.75%
Master's Degree	116	30.21%
PhD	73	19.01%
District		
Eastern Region	157	40.89%
Central Region	96	25.00%
Western Region	95	24.74%
Northeast Region	36	9.38%
Working years		
Less than 5 years (inclusive)	17	4.43%
5-10 years (including 10 years)	36	9.38%
10-15 years (inclusive)	60	15.63%
15-20 years (including 20 years)	76	19.79%
20-25 years (including 25 years)	81	21.09%
25-30 years (including 30 years)	66	17.19%
More than 30 years	48	12.5%

4. Findings

Regression-based PLS-SEM was used to analyse the data, using SPSS 26.0 and SmartPLS 4. PLS-SEM is more flexible than CB-SEM and is well-suited for smaller data

sets due to its ability to handle different data distributions. Moreover, PLS-SEM serves as a causal predictive technique in the SEM framework, effectively connecting interpretative analysis with predictive accuracy. This establishes a strong basis for extracting management insights (Shmueli et al., 2019).

4.1 Demographics

Table 1 presents an overview of the demographic characteristics of the respondents. The significant proportion of survey participants with a high Level of education contributes to a robust knowledge foundation for digitalization, enabling quick comprehension and adjustment to emerging technologies. The middle-aged and older population, particularly those aged 35–64, may require further instruction and support in utilising digital technology and comprehending accounting information in order to enhance their adaptability (Abril-Jimenez et al., 2022).

The proportion of individuals with higher education (bachelor's degree and above) in this demographic data is notably high, at 92.97% (Demamu, 2024). This suggests that the respondents possess a robust capacity for learning and the potential to adapt to emerging technologies. The Eastern region has a higher population proportion, indicating that state-owned enterprises (SOEs) in this region have greater opportunities and resources for advancing digitalization and improving sustainability performance (Xu et al., 2022). The proportion of individuals with higher education (bachelor's degree and above) in this demographic data is notably high, at 92.97% (Demamu, 2024). This suggests that the respondents possess a robust capacity for learning and the potential to adapt to emerging technologies. The Eastern region has a higher population proportion, indicating that state-owned enterprises (SOEs) in this region have greater opportunities and resources for advancing digitalization and improving sustainability performance.

Table 2: Descriptive Statistics

	DT	AIQU	SDP
N	384	384	384
Missing	0	0	0
Mean	4.31	4.21	4.42
Std. error mean	0.0728	0.0680	0.0594
Median	4.20	4.40	4.49
Standard deviation	1.43	1.33	1.16
Variance	2.04	1.77	1.36
Minimum	1.40	1.00	1.53
Maximum	7.00	7.00	6.89
Skewness	0.218	-0.0460	-0.347
Std. error skewness	0.125	0.125	0.125
Kurtosis	-0.259	-0.403	-0.222
Std. error kurtosis	0.248	0.248	0.248
Shapiro-Wilk W	0.949	0.984	0.976
Shapiro-Wilk p	< .001	< .001	< .001

4.2 Measurement model

The final phase of the measurement modelling process involves determining discriminant validity using the heterotopic-monotopic (HTMT) correlation ratio

criterion. Bias can be explained by either the correlations between constructs or the number of items loading on each construct (Voorhees et al., 2016). In addition to streamlining the evaluation process, HTMT provides a distinct cut-off score for optimal outcomes. The HTMT scores of all first- and second-order constructs, as presented in Table 4, were below the recommended threshold of 0.9, as suggested by (Hair et al., 2019). This study confirms the discriminant validity of the constructs under investigation.

Table 3: Evaluation of construct reliability and convergent validity

Reflective Components/Constructs	Items	Outer Loadings	Cronbach's Alpha	ρ_A	AVE
First-order reflective components and unidimensional constructs					
Understanding ability of "accounting information quality"			0.901	0.903	0.716
	AIQU1	0.882			
	AIQU2	0.851			
	AIQU3	0.875			
	AIQU4	0.834			
	AIQU5	0.787			
Digital transformation			0.933	0.934	0.788
	DT1	0.898			
	DT2	0.890			
	DT3	0.886			
	DT4	0.905			
	DT5	0.858			
Economic Performance			0.875	0.877	0.800
	SDPEC1	0.873			
	SDPEC2	0.905			
	SDPEC3	0.904			
Environmental Performance			0.959	0.959	0.830
	SDPEN1	0.911			
	SDPEN2	0.908			
	SDPEN3	0.918			
	SDPEN4	0.903			
	SDPEN5	0.909			
	SDPEN6	0.916			
Social Performance			0.949	0.950	0.832
	SDPS1	0.921			
	SDPS2	0.913			
	SDPS3	0.910			
	SDPS4	0.928			
	SDPS5	0.888			
Second-order reflective construct					
Sustainable Development Performance			0.780	0.780	0.695
Economic Performance		0.821			
Environmental Performance		0.847			
Social Performance		0.831			

Table 4: Evaluation of Discriminant Validity using the HTMT Criterion

Constructs/Dimensions	AIQU	DT	SDP		
			SDPEC	SDPEN	SDPS
First-order reflective components and unidimensional constructs					
AIQU					
DT	0.401				
SDPEC	0.389	0.573			
SDPEN	0.350	0.499	0.601		
SDPS	0.357	0.619	0.557	0.593	
Second-order reflective construct					
SDP	0.479	0.738			

4.3 Second Order Construct

Table 5: PLS-SEM vs. Indicator average

	Average loss difference	t value	p-value
DT	-0.265	3.542	0.000
SDP	-0.109	3.790	0.000
SDPEC	-0.193	3.229	0.001
SDPEN	-0.239	3.004	0.003
SDPS	-0.196	3.088	0.002
Overall	-0.211	4.012	0.000

In PLS-SEM, the PLS prediction approach uses holdout samples for predictions and performs cross-validation using a k-fold methodology (Hair et al., 2019; Shmueli et al., 2019). The predictive accuracy was assessed using various metrics, including Mean Absolute Error (MAE) and Root Mean Square Error (RMSE). Table 5 presents the results of the PLS forecasts. None of the metrics in the PLS-SEM analyses exceeded the RMSE (or MAE) values of the Naive IA baseline, indicating an improvement in the model's predictive ability.

4.4 Collinearity

Table 6: Inner VIF values.

Constructs/Dimensions	VIF
First-order reflective components and unidimensional constructs	
AIQU -> DT	1.000
SDP -> SDPEC	1.000
SDP -> SDPEN	1.000
SDP -> SDPS	1.000
Second-order reflective construct	
AIQU -> SDP	1.159
DT -> SDP	1.159

Prior to evaluating the structural relationship, it is important to analyse covariance in order to mitigate any potential influence on the regression results (Cao et al., 2024). According to Hair et al. (2019), VIF values above 5.0 suggest the presence of covariance between predicted components, while values close to or below 3.0 are

considered desirable. Table 6 shows that the inner VIF values are close to 1.0, suggesting that there are no collinearity issues in this investigation.

4.5 R Square

The evaluation of a model's effectiveness typically involves assessing its variance using the R2 metric. Hair et al. (2019) categorised R2 values of 0.75, 0.50, and 0.25 as indicators of strong, moderate, and weak explanatory power, respectively. When it comes to predicting human perceptions, attitudes, and intentions, R2 values above 0.90 indicate overfitting (Hair et al., 2019). The study found that the R2 value for digitalization (digital transformation) is 0.137, indicating potential areas for model improvement or the inclusion of additional variables (Table 8). The proportion of 0.431 is considered moderate, indicating that the model explains a substantial amount of the variance in SDP. The above results are depicted in following Table.7 below,

Table 7: The R^2 values of the Endogenous Construct

	R-square	R-square adjusted
DT	0.137	0.135
SDP	0.431	0.428

4.6 Effect Size

When comparing the magnitudes of the path coefficients and the f^2 effect, the importance of the forecasted structural formulas in explaining the causal structural formulas often aligns (Nitzl et al., 2016). The benchmarks of 0.02, 0.15, and 0.35 are commonly used to classify f^2 effects as small, medium, and large, respectively (Cohen, 2013). The AIQU has a slightly above medium effect on DT, as indicated by a f^2 value of 0.159. The findings indicate a moderate and distinct influence of AIQU on DT. The f^2 value of 0.058 suggests a small effect of AIQU on SDP, indicating a minor unique contribution of AIQU to SDP. The effect size category for this effect, as indicated by a f^2 value of 0.474, is large. This suggests that DT has a significant unique impact on SDP. The above results are predicted in following Table.8 below,

Table 8: The f^2 values of the Endogenous construct.

	f-square
AIQU -> DT	0.159
AIQU -> SDP	0.058
DT -> SDP	0.474

4.7 Structural model

The evaluation of the structural model depends on path coefficients, which quantify the strength of interactions between variables. According to Urbach and Ahlemann (2010), route coefficients are categorised as small if they are ≥ 0.19, medium if they are > 0.32, and big if they are ≥ 0.67. In order to assess the significance of the hypothesised path coefficients surpassing the suggested thresholds, we performed a bootstrap analysis with 10,000 resamples. This allowed us to calculate p-values and t-values. Figure 2 and Table 9 present the results. The path coefficient from AIQU to SDP is positively and significantly associated, supporting RH1 with a small effect. Similarly,

the path coefficient from DT to SDP is also positively and significantly associated, supporting RH2 with a large effect. Finally, the path coefficient from AIQU to DT is positively and significantly associated, indicating that RH3 has a medium effect. These hypothesis are predicted in following Table.9 below,

Table 9: Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AIQU -> DT	0.370	0.371	0.042	8.847	0.000
AIQU -> SDP	0.196	0.195	0.041	4.714	0.000
DT -> SDP	0.559	0.559	0.034	16.227	0.000

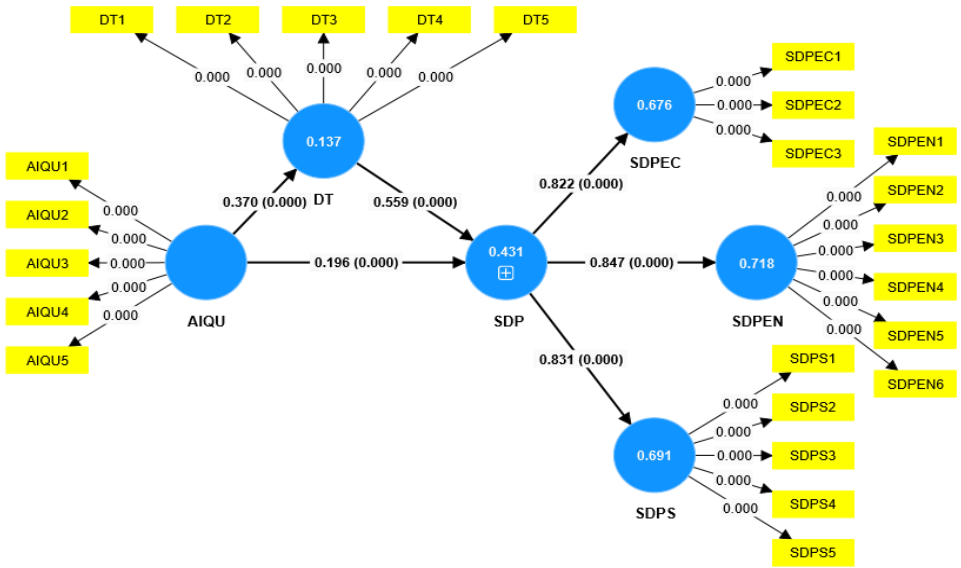

Figure.2: Structural Model

Table 10: Mediation effects.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AIQU -> DT -> SDP	0.208	0.209	0.029	7.217	0.000

The results in Table 10 indicate a significant mediation effect of DT on the AIQU-SDP relationship, with an indirect effect size of approximately 0.208. The proximity between the original sample and the sample mean, combined with the small standard deviation, confirms the reliability of the effect size. The high T statistic provides additional evidence of this effect's statistical significance, emphasizing the mediating role of DT between AIQU and SDP.

5. Discussion and Conclusion

Enhancing the quality of accounting information in decision sciences improves sustainable development performance by facilitating the adoption of digital

technology. Advanced systems enable better data accuracy, accessibility, and analysis. By integrating high-quality accounting information with innovative digital tools, organisations can enhance decision-making, track and report sustainability practices, and optimise resource management to align with environmental, social, and economic objectives. Therefore, this relationship highlights the significance of decision sciences in utilising technological advancements to advance sustainable development initiatives. This study aims to explore the mediating role of digital technologies in the relationship between accounting information quality and sustainable development performance in Chinese state-owned enterprises. It incorporates a holistic perspective by integrating dynamic capabilities theory and knowledge-based theory.

The regression results indicate a positive and significant impact of the accounting information system on the sustainable development performance of state-owned organisations in China. The findings of this study differ from previous research conducted in different contexts. While prior studies may not provide direct evidence for the findings of this study, they do offer some indirect support. Schroeder et al. (2019) investigate the potential of circular economy strategies to contribute to the achievement of Sustainable Development Goals (SDGs) in developing nations. They also discuss the significance of transparent and comprehensible accounting information for promoting sustainable practices. Bebbington and Larrinaga (2014) examine the role of accounting in sustainable development, focusing on research questions of broader significance and discussing performance and reporting guidelines (Bebbington & Larrinaga, 2014). The improved understanding ability of accounting information quality can contribute to enhancing sustainable development performance.

The findings indicate that digital technologies have a positive and significant impact on sustainable development performance. This study demonstrates the contribution of digitalization to sustainable development performance in Chinese companies. This research in the decision sciences emphasises the significant role of digital technologies in enhancing sustainable development performance. It underscores the importance of embracing technological advancements for informed decision-making. Bohnsack et al. (2022) conducted a previous study that aligns with this finding. The results align with Li et al. (2018) study on how SMEs can achieve digitalization from a capability perspective. They emphasise that digitalization is crucial for sustainable growth. These findings emphasise the significance of scientists using digital tools to optimise resource allocation and drive progress towards the sustainability goals of Chinese SOEs.

The study revealed a positive and significant relationship between the quality of accounting information and the adoption of digital technologies by Chinese state-owned enterprises (SOEs). This study highlights the significance of incorporating robust accounting practices into digital transformation strategies in Chinese State-Owned Enterprises (SOEs). It underscores the importance of accounting information quality in digital technologies in the field of decision sciences. Understanding this relationship informs decision-making processes that guide investments in technology adoption and accounting systems to enhance operational efficiency, transparency, and ultimately, sustainable performance. Gelinas et al. (2011) provide a comprehensive analysis of accounting information systems, highlighting the potential for enhanced

accounting information to improve the quality and understanding ability of digital technologies (Gelinas et al., 2018). Wang et al. (2019) conducted additional research on the importance of high-quality accounting information in adopting new technologies and driving digitalization. The findings indicate that accounting information systems in Chinese state-owned enterprises play a significant role in enhancing digital technologies, thereby contributing to the sustainability of these companies.

Finally, the study discovered that digital technologies play a important role in mediating the relationship between accounting information quality and the sustainability performance of Chinese state-owned enterprises. The findings demonstrate that digital technologies play a crucial role in mediating the relationship between accounting information quality and sustainability performance in Chinese State-Owned Enterprises (SOEs), emphasising the transformative potential of technological integration in the field of decision science. Leveraging advanced digital tools enhances the quality and accessibility of accounting information and facilitates better decision-making processes, driving sustainable development objectives forward. The research results are consistent with previous studies. Gunasekaran and Nath (1997) support the finding through examination. Moreover, Heredia et al. (2022) discovered that digital technologies play a crucial role as a mediator in various relationships. Research findings highlight the important role of decision sciences in facilitating the integration of accounting practices, technological innovation, and sustainable performance in state-owned enterprises (SOEs).

The study concluded that the quality of accounting information and the transformation of digital technology are important factors in enhancing the sustainable development of SOEs. The study emphasised the interconnectedness of factors and their transformative impact on organisational strategies and outcomes, supported by strong analysis and empirical evidence. Moreover, the mediating effect of digital technologies emphasises their crucial role in enabling informed decision-making and optimising resource allocation for sustainable progress. The findings emphasised the importance of integrating robust accounting practices and utilising technological advancements to advance sustainability initiatives. This integration can improve the resilience and effectiveness of state-owned enterprises (SOEs) in addressing sustainability challenges.

5.1 Theoretical implications

This study contributes to the existing literature in three key areas, providing theoretical significance. Prior studies have examined the effect of digitalization on "accounting information quality." However, there is a lack of research on the relationship between understanding ability and digitalization. This study shows that enhancing the comprehensibility of "accounting information quality" promotes digitalization. Furthermore, while previous research has confirmed the positive impact of digitalization on corporate sustainability, there is a lack of studies investigating the factors that drive sustainability performance with digitalization as a mediating variable. This study addresses this gap by demonstrating the partial mediating role of digitalization within the research framework, acting as a mediator between the understanding ability of the quality of accounting information and

sustainability performance. Thirdly, the research population of this study is Chinese SOEs, which fills the gap in the research population of existing studies.

5.2 Managerial implications

This study provides valuable insights for professionals. The comprehensibility of accounting information enhances its effective utilisation by management and other stakeholders in decision-making. This aids companies in making informed and sustainable decisions that are responsive to a dynamic market environment. Digitalization enhances the connection between high-quality accounting information and business sustainability. Therefore, it is crucial for Chinese SOEs to prioritise investments in digital technologies and systems such as cloud computing, artificial intelligence, and big data analytics. This will greatly improve the efficiency of their accounting, information processing, and reporting processes. Furthermore, by utilizing electronic means, enterprises have the opportunity to improve their understanding and use of accounting information, ultimately enabling them to develop and report on sustainable development strategies. This not only enhances the corporate social responsibility (CSR) status of companies but also boosts their reputation among investors and customers. Lastly, the acknowledgment and utilisation of reliable accounting data can result in improved resource planning that balances environmental preservation and economic effectiveness. The incorporation of digital technology in such a process is essential due to its ability to minimise waste and provide precise resource data.

6. Study Limitations and Future Directions

There are still some limitations in the study that could be further addressed to enhance the new research area. Initially, the main focus of this research is on executives of Chinese state-owned enterprises (SOEs). The outcomes may vary for different regions or types of businesses as the study is centred around a specific group of individuals. Therefore, further investigation could be conducted on economies and other sectors to enhance the generalizability of the research. In addition, it is important to consider other factors that may influence the relationship, rather than solely focusing on mediating effects. Conducting further research with a broader scope that includes moderating variables can enhance the generalizability of the findings. Furthermore, the study focused on the field of decision sciences within operations research, while neglecting the perspective of operations management. Therefore, to gain insights into the variations in outcomes, we could conduct further investigation into the field of operations management, specifically focusing on topics like supply chain resilience or lean sigma practices.

Data availability statement

Data included in article/supp. material/referenced in the article.

Authorship contribution statement

Lei Chen: Conceptualization, Methodology, Writing - original draft.

Gooi Leong Mow: Writing - review & editing.

Fangnan Wei Conceptualization, Data analysis

Xuejing Song: Investigation, Data Curation

Zhenguo Wang: Investigation, Data collation

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