Digital Culture Revolution in Improving Firm Performance in Indonesia

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Abstract. This research examines the moderating role of digital culture, business intelligence, accounting information systems, and digital technology in transforming, revolutionizing, and improving firm performance. The novelty of this research is the addition of the dimensions of each variable so as to increase the accuracy of variable measurement. It can be implemented by the company, which if implemented carefully will support the firm's performance. The research sample is a company in Indonesia with a closed questionnaire collection method. The study results show that only digital culture can significantly increase firm performance and digital culture moderates the increase in firm performance by business intelligence. The test results show that digital culture has the most significant effect on firm performance. Recommendations that can be given to companies are that implementation must be carried out immediately so that the firm's competitiveness can continue to excel in the market. Recommendations for future research can use other factors such as the application of green, leadership, innovation, and other factors that can improve firm performance, especially digital performance.

Keywords: Firm Performance, Digital Culture, Business Intelligence, Accounting Information System, Digital Technology

1. Introduction

Indonesia's economic growth has fluctuated in the last 10 years. In 2011, it reached its highest point, namely the growth of Gross Domestic Product (GDP) of 6.26%. For several years, there have been ups and downs in economic growth but it is still said to be good because it has a positive value. This can be seen in Figure 1.

In 2020, there was a sharp decline, where GDP growth of -2.93% coincided with economic difficulties experienced by almost the whole world. However, it was only one year and began to increase slowly in 2021. In 2020, when the COVID-19 pandemic began to spread in Indonesia, this led to a business transformation, which relied more on the online sector than offline due to restrictions on community activities. Based on data from Kominfo, internet/digital penetration in Indonesia in 2014 was 17%. Whereas in 2018 it was 64.8%, in 2019-2020 it was 73.7% and in 2021-2022 it was 77.02%. This proves that digitalization will greatly affect human life, including in business.

In a fast-paced and dynamic business world, companies are looking for new ways to stay competitive and relevant. The main drivers of change are digital technologies and the transformation of traditional business practices. As we adopt new digital technologies, we also adopt new digital cultures, changing the way we operate and compete. The development of information and communication technology has changed the way companies operate. Organizations must adapt to these changes to stay competitive, and digital culture is becoming a key factor in this transformation (Pradana et al., 2022).



Fig. 1: Indonesia's Economic Growth Source: Central Bureau of Statistics, 2023

In the digital era, companies must adapt quickly to changes that occur in an increasingly complex and rapidly changing business environment. The phenomenon of changing firm performance is the adoption of digital technology and business digitization. Digitalization opens up new opportunities for companies to improve operational efficiency, improve customer experience and improve financial performance. However, digitization poses new challenges, such as data security and privacy risks, regulatory uncertainty, and increasingly fierce competition. Companies that succeed in the digital era are able to manage risks and exploit the opportunities they face.

The roles of business intelligence, accounting information systems, and digital technology are becoming more important (Chandra et al., 2018). They are key tools for managing and analyzing data, providing insight into customer behavior, market trends, and business performance. Utilizing these three things, companies make data-driven decisions and stay ahead of the competition.

There are several studies that support the selection of these factors, such as research (Bach et al., 2018; Rouhani et al., 2016) showing a positive effect of business intelligence on firm performance, but

research (Vugec et al., 2020) shows the opposite. For accounting information system variables, research (Latifah et al., 2021; Rosa & Purfini, 2019) shows a positive effect on firm performance, but research (Khalid & Kot, 2021) shows a negative effect. For digital technology variables, research (Renaldo et al., 2021, 2022) shows a positive effect on firm performance, but research (C. D. Astuti et al., 2022; Renaldo & Augustine, 2022) shows no effect.

At the same time, digital culture moderation is becoming increasingly important. By managing digital culture effectively, companies improve collaboration, productivity, and communication, while minimizing the risk of cyber threats and reputational damage. Research that examines the effect of digital culture on firm performance by (Farida et al., 2021) has a positive effect, but research (Kwarteng & Aveh, 2018) shows results that have no effect.

This research examines the moderation role of digital culture, business intelligence, accounting information systems, and digital technology in transforming business performance in exploring how these tools can be leveraged to drive innovation, improve customer experience and increase revenue. Specifically, the main objective is to see whether digital culture moderation can improve company performance or not. This research looks at the challenges and opportunities associated with digital transformation (Subiyakto et al., 2023) and provides recommendations for companies looking to adopt these tools and practices.

Previous research has only discussed non-financial performance but has not measured a company's digital performance. Previous research has not used business intelligence, digital technology, and digital culture variables, especially in Indonesia. The weakness of the previous variable measurement is that it still does not include digital elements and business intelligence. The novelty of this research is the development of new dimensions and indicators to measure each variable. Firm Performance Variable added 1 dimension (3 indicators). The Digital Culture variable is added to 2 dimensions (6 indicators). Business Intelligence Variable added 2 dimensions (7 indicators). The Accounting Information System variable added 2 dimensions (10 indicators). Digital Technology variables added 2 dimensions (7 indicators). This insight is to improve the accuracy of variable measurement and can be implemented by the company, which if implemented carefully will support the company's performance.

2. Literature Review

2.1. I/O and RBV Paradigm

The I/O (Industrial Organization) theory posits that external factors, specifically industry-related influences, have greater significance in attaining competitive advantage compared to internal factors. Heterogeneity, complexity, and changes in the industry environment impact a company's strategic planning intensity. Conversely, the Resources Based View (RBV) Theory asserts that internal factors hold greater importance than external factors (industry) in gaining a competitive advantage. Competitive advantage is contingent upon the resources possessed by the company. The internal resources of a company or organization serve as a source of competitive advantage (Hutahayan, 2020).

The relation of the RBV theory in the variables of business intelligence, accounting information systems, and digital technology is that these three variables are internal components capable of influencing the company. Increasingly applying these three factors, will improve firm performance. Companies with strong capabilities in collecting and analyzing business data have a valuable resource. Companies that are able to produce accurate and relevant financial information have advantages in making financial decisions and long-term planning. Companies that are able to effectively adopt and integrate digital technology have capabilities that are difficult for competitors to imitate.

Meanwhile, the relation between I/O theory and digital culture variables is because digital culture originates outside and generally influences companies. Digital culture, which includes values, norms, and practices related to technology and digitization, usually stems from external trends and influences such as technological developments, industry trends, and consumer behavior. The digital culture that

develops in the external environment can have a major impact on company performance. Companies that are able to adopt a digital culture that suits their external environment and integrate it with their operations and business strategy can gain a competitive advantage.

2.2. Firm Performance

Firm performance is defined as a collection of metrics used to measure the efficiency and effectiveness of company actions (Kakhki & Palvia, 2016). Firm performance (Kourriche & Aboutafail, 2023) refers to the evaluation and measurement of the extent to which the company has achieved the set goals and objectives. This involves assessing the effectiveness and efficiency of the company in carrying out its business operations. Measurement of firm performance uses the dimensions of environmental performance (Nguyen & Hoai, 2022), financial performance (Hutahayan, 2020), marketing performance (Hutahayan, 2020), and digital performance (novelty). A measurement approach to obtain holistic and generalizable variables. The argument for the need for digital performance is that digital performance enables organizations to increase operational efficiency and productivity by automating business processes, reducing human error, and improving workflow.

2.3. Digital Culture

Organizational culture refers to a set of shared values and beliefs that guide individuals in understanding how the organization operates and establish norms of behavior within the company (Arefin et al., 2015). Digital culture refers to mindsets, behaviors, and practices related to the use of digital technology in everyday life. This culture reflects the social transformation brought about by advances in information and communication technology, especially the internet and mobile devices.

The aim of digital culture moderation is because digitalization impacts not only technology and business processes but also corporate culture and ways of working. Changes in the culture of the digital era can significantly affect firm performance. Digital culture moderation is an approach to managing and directing cultural change in organizations. This moderation helps companies overcome cultural challenges that arise as a result of digitalization, maximize the benefits of digitalization, reduce inconvenience, change the view of technology to be positive and productive, change employee behavior, and strengthen a collaborative culture that is flexible and adaptive. This is important to create a work environment that is responsive to change and can maximize the benefits of digital technology.

Measurement of digital culture uses the dimensions of organizational culture (Arefin et al., 2015), digital transformation (Nguyen & Hoai, 2022), human capabilities, and innovation capabilities as a novelty. A measurement approach to obtain digital culture variables that can improve corporate culture towards digitalization. The argument for why human capabilities and innovation are needed is that good human capabilities and continuous innovation help companies stay competitive in a changing global market.

2.4. Business Intelligence

Business Intelligence (BI) encompasses the tools, applications, and methodologies commonly employed to aid decision-making in business settings (Kavitha et al., 2023). Through BI, managers can effectively convert and manipulate data into valuable knowledge and actionable insights (Abai et al., 2019). Measurement of business intelligence uses the maturity dimensions of business intelligence (Vugec et al., 2020), the effectiveness of business intelligence (Arefin et al., 2015), data processing, and data visualization as a novelty. A measurement approach to obtain business intelligence variables whose application can help companies manage their data. The argument for adding dimensions is efficiency, data processing allows the collection, storage, and processing of information efficiently. With good data processing, data can be accessed quickly and easily, saving time and resources. Then effective communication, because data visualization allows the presentation of complex information in graphical form, which is easier to understand and attractive to the audience. This facilitates more effective and impactful communication.

2.5. Accounting Information System

The Accounting Information System (AIS) is comprised of four primary sub-systems. Firstly, the transaction processing systems facilitate the organization's daily operations by generating messages and documents for various users. Secondly, the management reporting systems produce specialized reports to aid internal management in making crucial decisions like budgeting. Thirdly, the ledger reporting system generates traditional financial reports required by law, such as balance sheets and income statements (Renaldo & Murwaningsari, 2023), and other documents mandated by law; and a fixed asset reporting system, which processes transactions related to the acquisition, maintenance, and disposal of fixed assets within the organization. Traditionally, AIS relied heavily on paper-based processes, making it less suitable for the fast-paced modern business environment. However, with the advent and progress of information technology (IT), the nature of business operations, including AIS, has undergone a significant transformation (Khalid & Kot, 2021). The AIS measurement uses the dimensions of Integration, Flexibility, Accessibility, Formalization (Farida et al., 2021), Knowledge, and Company Support as a novelty. A measurement approach for accounting information system variables helps companies get information faster. The argument for adding this dimension is in-depth knowledge, where knowledge of accounting information systems includes a deeper understanding of accounting principles, regulations, and financial reporting standards. With this solid understanding, systems can be properly designed and configured to record and report financial information accurately and in compliance with legal and regulatory requirements.

2.6. Digital Technology

Technology serves as a convenient and efficient tool to accomplish tasks with ease. It constantly evolves over time, progressing from simple to complex forms. Digitization, which involves transforming analog data into digital datasets, represents the utilization of digital resources (W. A. Astuti & Augustine, 2022). Measurement of digital technology uses the dimensions of digital collaboration and digital technical capabilities by (Nasiri et al., 2020) and Supply Chain Technology and Platforms as a novelty. A measurement approach for digital technology variables that provide collaboration and performance-enhancing capabilities. The argument for adding this dimension is to increase connectivity because digital technology enables better connectivity between various partners in the supply chain, such as suppliers, manufacturers, distributors, and customers. This helps in the real-time exchange of information, speeds up workflow, and reduces response time to changing requests or requirements.

2.7. Research Hypothesis

2.7.1. The Effect of Business Intelligence on Firm Performance

Business Intelligence assists companies in the quick and effective collection, analysis, and presentation of relevant data. With access to accurate and up-to-date information, management can make better and more informed decisions. This can have a direct impact on firm performance by enabling more strategic decision-making, identifying new opportunities, and mitigating risks. This is supported by research (Bach et al., 2018; Ho et al., 2022; Rouhani et al., 2016) and RBV theory because internal company implementation will support accelerated performance. The first hypothesis of this research is: H1: Business Intelligence improves Firm Performance

2.7.2. Effect of Accounting Information Systems on Firm Performance

AIS enables companies to collect, manage and report financial data more accurately and efficiently. With an AIS, human error can be reduced and data processing becomes more automated. This ensures that the resulting financial reports are more reliable and accurate, which in turn improves the quality of information used in making decisions to support firm performance. This is proven by research (Khalid & Kot, 2021; Latifah et al., 2021; Rouhani et al., 2016) and RBV theory because good system resources

will speed up the data processing process needed in achieving company performance. The second hypothesis of this study is:

H2: Accounting Information Systems improve Firm Performance

2.7.3. The Influence of Digital Technology on Firm Performance

Digital technology enables business process automation and more efficient use of tools. Companies can take advantage of integrated software and systems to automate routine tasks, reduce the time required to complete tasks, and improve overall operational efficiency. This can reduce production costs, speed up response times, and optimize resource use thereby increasing firm performance. This is proven by research (Hanelt et al., 2021; Lutfi et al., 2022; Nguyen & Hoai, 2022) and RBV theory because digital technology must be followed by companies so they are not left behind the performance of other companies that have implemented it. The third hypothesis of this study is:

H3: Digital Technology improves Firm Performance

2.7.4. The Effect of Digital Culture on Firm Performance

The digital culture encourages companies to be more innovative and adaptive to changes in technology and markets. By promoting an open attitude to change and experimentation, companies can create an environment that enables the emergence of new ideas, the development of innovative products and services, and the optimization of business processes. An adaptive digital culture also allows companies to more quickly respond to trends and evolving market needs and ultimately affect firm performance. This is proven by research (Kwarteng & Aveh, 2018; Nasiri et al., 2020; Nguyen & Hoai, 2022) and I/O theory because digital culture is an external factor that enters the company and if implemented properly will improve performance. The fourth hypothesis of this study is:

H4: Digital Culture improves Firm Performance

2.7.5. Digital Culture Moderates the Effect of Business Intelligence on Firm Performance

A strong digital culture promotes technology acceptance and adoption. In the context of Business Intelligence, a digital culture that supports the adoption of BI technology will provide incentives for employees and company management to use and utilize available BI tools. With a digital culture that is effective in moderating the use of BI, companies can achieve significant performance improvements. Better data-driven decision-making, faster response to market changes, and increased operational efficiency are some of the possible outcomes. This is proven by research (Bach et al., 2018; Farida et al., 2021; Vugec et al., 2020). The fifth hypothesis of this research is:

H5: Digital Culture moderates the improvement of Firm Performance by Business Intelligence

2.7.6. Digital Culture Moderates the Effect of Accounting Information Systems on Firm Performance

A digital culture that encourages education and awareness about Accounting Information Systems will help employees and company management understand the importance of AIS in improving a company's financial performance. By providing relevant training and resources, companies can ensure that employees have a good understanding of the AIS and are able to use it effectively to achieve good performance. With a digital culture that is effective in moderating the implementation of AIS, companies can experience a positive impact on their performance. The use of more accurate and comprehensive financial information, as well as more informed decision-making, can result in better financial and operational performance. This is proven by research (Ali et al., 2016; Hutahayan, 2020; Latifah et al., 2021). The sixth hypothesis of this research is:

H6: Digital Culture moderates the improvement of Firm Performance by Accounting Information Systems

2.7.7. Digital Culture Moderates the Effect of Digital Technology on Firm Performance

Digital culture encourages collaboration and engagement among employees, departments, and teams in

the use of digital technology. With digital collaboration tools such as file-sharing platforms, instant messaging, and virtual workspaces, employees can work together effectively even in different locations. A digital culture that encourages collaboration and engagement will strengthen the influence of digital technology on firm performance through increased communication, coordination, and work efficiency. With a digital culture that is effective in moderating the application of digital technology, companies can experience significant performance improvements. Benefits include increased operational efficiency and productivity. This is proven by research (Kuntari et al., 2022; Kwarteng & Aveh, 2018; Pradana et al., 2022). The seventh hypothesis of this study is:

H7: Digital Culture moderates the improvement of Firm Performance by Digital Technology

3. 3. Research Methodology

3.1. Research Design

This study uses a quantitative approach to examine the effect between variables. This research is survey research with a questionnaire data collection method (cross-sectional). The scale used is an interval. Developing a questionnaire based on previous research and adding dimensions as a novelty (according to Table 1). There is no interference from the researcher so this research studies the phenomenon as it should happen (Sekaran & Bougie, 2016), so even though the sampling uses criteria, the questionnaires are distributed randomly. The research environment is non-contrived due to surveys on field studies. The unit of analysis is a company with a one-shot (cross-section) timeframe. Data analysis begins with descriptive statistics, preliminary tests (validity and reliability), hypothesis testing, and sensitivity tests.

3.2. Population and Sample

The population is human resources who play an important role in the company. Based on the Central Bureau of Statistics, there are 29,363 companies in Indonesia. According to (Hair et al., 2019), the minimum ratio of observations to variables is 5:1. This study uses 91 indicators forming 22 dimensions which form 5 variables plus 4 control variables, so there are 95 indicators that need attention. With a ratio of 5:1, the minimum sample size is 455 companies. Samples can be used as 500 because if you have a complex model, you can use a minimum sample of 500 (Hair et al., 2019).

A sample of 500 companies that are considered to represent Indonesia, namely by looking for as many as 15 sample companies per province in Indonesia. The sampling technique was purposive sampling. Respondents in the company were limited to a minimum of a manager's position, with at least 3 years of work experience in the company to demonstrate that the respondent has the necessary prowess and expertise to join in research to provide in-depth data (Acquah et al., 2020). Of the 500 questionnaires distributed, only 250 respondents were successfully obtained.

3.3. Types, Sources, and Data Collection Methods

The data used in this research is primary data. The research data comes from the company's respondents' answers to the questionnaire given. Distribution of questionnaires using Google Forms within a period of 3 months.

3.4. Research and Measurement Variables

The operational variables used in this study are shown in Table 1. Variables are measured using dimensions and indicators from previous research, added with new dimensions with arguments that have been explained in the literature review. Codification of indicators based on dimensions and variable names. This study uses a 6-level Likert scale.

X7 • . 1. 1.	D'		S
variable			
F1rm	Environmental Deufermental	The company complies with environmental regulations	(Nguyên & Hoai, 2022)
Performance	Performance	The company prevents and mitigates environmental crises	-
		reculatory compliance	
		The composite advantes and the multic shout the	-
		any ironment	
	Eirm	The company experienced revenue growth	(Hutshavan 2020)
	Performance	The company experienced revenue growth	(Hutanayan, 2020)
	1 enformance	The company experienced a reduction in costs	-
	Maulastina	Solar of the company experienced an increase in the use of assets	-
	Derformence	Sales of the company's products have increased	-
	renormance	Company's auribules nave increased	-
	Distal	The commonly experienced on increased	Nevelty
	Digital	Company experienced an increase in user retention	Noverty
	Performance	Companies accelerate the use of information	-
		Companies are increasing the conversion of data into	
D' '4 1	0 1		(4 6 4 1 2015)
Digital	Organizational	Most people in companies have input into the decisions that	(Arefin et al., 2015)
Culture	Culture	Comparation and collaboration correct functional rales are	-
		cooperation and collaboration across functional roles are	
		There is a high degree of a mean and the set have this as and	-
		done in the company	
		The empression to doing hypinges is years consistent and	-
		readiatel	
			-
		customer comments and recommendations often read to	
		The company is your remaining and changes his	-
		The company is very responsive and changeable	-
		The company has long term goals and direction	-
		in the future	
	Distal	Communica digitize assembling that can be digitized	(Nauron & Hasi 2022)
	Transformation	Companies adjuze everything that can be digitized	(Nguyên & Hoai, 2022)
	Transformation	sources	
		Companies create stronger networks between different	-
		business processes with digital technologies	
		Companies are enhancing efficient customer interfaces with	-
		digitality	
		The company achieves information exchange with digitality	-
	Human	Digital skills development is supported and promoted in the	Novelty
	Capability	company	itoveny
	cupacing	Employees are well trained in the use of digital tools	-
		Digitization of the operating environment is easily accented	-
		by employees	
	Innovation	Digitality enables innovation and new ideas in companies	-
	Capability	Digitality forces employees to develop new solutions	-
	cupacing	Digitality helps generate new products and services	-
Business	Business	Business Intelligence is used across all (where needed)	(Vugec et al. 2020)
Intelligence	Intelligence	organizational units hierarchical levels and application	(1 agee et al., 2020)
memgenee	Maturity	areas	
	1.1	Internal (structured or unstructured) and external data are	-
		fully integrated, and requirements (e.g., data quality) are met	
		Decision making is based on Business Intelligence and	-
		Business Intelligence is considered to have a critical impact	
		on organizational performance	
		Company-wide data warehouses are used	-
		Automatic data integration: special tools for data	-
		management and integration are used	
		Various Business Intelligence tools and techniques are used	-
		There is a Business Intelligence competency center	-
		(Business Intelligence data analytics or similar) with a	
		comprehensive spectrum of tasks and competencies	
		Business Intelligence specific processes are actively defined	-
		and managed	

Table 1. Operational Variables

Variable	Dimension	Indicator	Source
		Cross-project-oriented and benefit-oriented Business	
		Intelligence profitability assessments are conducted	
		There is a specific Business Intelligence strategy and it	
		clearly reflects Business Intelligence alignment	
	Business	Business Intelligence improves coordination with Business	(Arefin et al., 2015)
	Intelligence	Intelligence partners/suppliers	
	Effectiveness	Business Intelligence reduces transaction costs with	
		Business Intelligence partners/suppliers	
		Business Intelligence improves responsiveness to/from	
		suppliers	
		Business Intelligence improves the efficiency of internal	
		processes	
		Business Intelligence improves staff productivity	
		Business Intelligence reduces the cost of making effective	
		decisions	
		Business Intelligence reduces operational costs	
		Business Intelligence reduces the cost of handling customer	
		Duringga Intelligence netwood mediating costs	
		Business Intelligence reduces time to market	
		products/services	
	Data	Business intelligence helps companies gather data	Novelty
	Processing	Business intelligence helps companies transform data	noveny
	Theessing	Business intelligence helps companies transform data	
		Business intelligence helps companies analyze data	
	Data	Business intelligence helps companies present data	
	Visualization	Business intelligence helps companies understand	
	v isualization	information	
		Business intelligence helps companies discover trends	
		natterns and discrenancies	
Accounting	Integration	Accounting information systems can facilitate the	(Farida et al., 2021)
Information	0	acquisition of company information from different	
System		functional areas	
•		Integration between accounting information system	
		components and accounting information sub systems	
	Flexibility	Accounting information systems can adjust the needs	
		Accounting information systems can adapt to environmental	
		changes	
	Accessibility	The use of computerized accounting information systems is	
		flexible	
		Ease of accessing information in existing accounting	
		information systems	
	Formalization	Accounting information systems facilitate interaction	
		The executions	
		formal communication	
	Knowledge	The company has proper accounting knowledge	Novelty
	Kilowiedge	Knowledge of company accounting is necessary for the	Noveny
		proper recording of transactions and processing	
		The company provides training to provide the latest	
		accounting knowledge	
		Accounting knowledge is an important element for	
		implementing an accounting information system	
		The company believes that accounting knowledge can	
		improve firm performance	
	Company	Management support is a prerequisite for implementing an	
	Support	accounting information system	
		The company always supports the application of an	
		appropriate accounting information system	
		The company believes accounting information needs to be	
		updated and recorded properly	
		The company invests to implement and operate a proper	
		accounting information system	

Variable	Dimension	Indicator	Source
		The company believes that an appropriate and effective	
		accounting system can reduce inefficiencies and improve	
		performance	
Digital	Digital	Digital cooperation is carried out with other companies	(Nasiri et al., 2020)
Technology	Collaboration	Digital channels are used to share information with other	
		companies	
		Digitality is changing the shape of social relations in	
		business	
	Digital	Digitality increases the value of a product or service	
	Technical	Digitality enables the integration of products and services	
	Capability	into companies	
		Digitality enables up-to-date location independent services	
		for customers	
		Digitality makes it possible to work across boundaries of	
		time, place or activity	
	Technology	The company understands the Internet of Things	Novelty
		The company implements cloud storage	
		The company understands big data	
		The company performs data analysis using technology	
	Supply	The company implements a digital platform with suppliers	
	Chain	The company implements a digital platform with customers	
	Platform	The company implements a digital platform with other	
		corporate units	

Source: Article recapitulation, 2023

All data measurements through questionnaires use a 6-point scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The measurement scale is an interval. The firm age variable is measured by calculating 2023 with the year the firm was founded (ratio). The firm size variable is measured through the number of employees (ratio), digital certification through the number of certificates owned by the company in digital terms (ratio), and company ownership on a nominal scale if the firm is owned by a foreigner, then it is coded 1 and coded 0 if it is national.

3.5. Structural Equation Modeling Analysis

Based on the research framework model, the research equation is as follows:

 $FP = b_1BI + b_2AIS + b_3DT + b_4DC + b_5BIxDC + b_6AISxDC + b_7DTxDC + b_8Age + b_9Size + b_{10}Cert + b_{11}Own + e$

Information:

FP	:	Firm Performance
BI	:	Business Intelligence
AIS	:	Accounting Information System
DT	:	Digital Technology
DC	:	Digital Culture
Age	:	Firm Age
Size	:	Firm Size
Cert	:	Digital Certification
Own	:	Firm Ownership
b_1b_{11}	:	Coefficient
e	:	Error

Structural Equation Modeling analysis is used to find out which indicators strongly support the formation of variables and to find out which variables have the strongest influence on the dependent variable (Hair et al., 2019).

3.6. Data Analysis Technique

The analysis will begin with descriptive statistics on the respondents' characteristics and the

respondents' responses. This aims to determine the condition of the research sample. Then it will be continued with Structural Equation Modeling (SEM) analysis to examine the influence between variables. To use SEM (Hair et al., 2019), several preliminary tests are needed such as outer loadings (requirements ≥ 0.7), construct reliability and validity (requirements ≥ 0.7), and a coefficient of determination test which gives a positive adjusted r-square value. All analyses will use the SMART PLS application.

After the preliminary test is carried out, it will be followed by hypothesis testing and mediation testing. The hypothesis will be accepted if the P values are lower than the alpha used, namely 1%, 5%, and 10%. Each analysis will be completed with a moderation test. This test aims to find out whether the results of research with moderation effects can explain better about the model to the model without it.

4. Results

4.1. Descriptive Statistics of Respondent Characteristics, Respondent Responses, and Variable

As many as 63% of the respondents were men who were predominantly over 50 years of age with the last education dominated by undergraduates. As many as 78% of respondents are in managerial positions with 35% of experience working in companies held for 3-5 years. The age of the firm is dominated in the range of 3-8 years as much as 25% which are mostly centered in the Provinces of Riau, DKI Jakarta, and West Java respectively. The number of firm employees is dominated by the range of under 50 people as much as 42% with very diverse business sectors such as agribusiness, fisheries, expeditions, spare parts, online investment, trading, palm oil, food, construction, clothing, and others. As many as 82% of respondents represent companies owned by the private sector with an average digital certification of 11.5 certificates.

Respondents' responses to the firm performance variable have an average of 4,823 which is in the very good category. The highest dimension is environmental performance and the lowest is financial performance. This means that the focus of companies that are currently digitally oriented is not only on financial performance but already on environmental, digital, and marketing performance respectively. Respondents' responses to the digital culture moderation variable have an average of 4,801 which is in the very good category. The highest dimension is innovation capability and the lowest dimension is organizational culture (conventional). This means that the company has started to adopt an innovation-oriented culture, followed by digital transformation and human capabilities rather than conventional culture.

Respondents' responses to the business intelligence variable have an average of 4,702 which is in the very good category. The highest dimension is on data visualization and the lowest dimension is on the effectiveness of business intelligence. Respondents' responses to the accounting information system variable have an average of 4,772 which is in the very good category. The highest dimension is knowledge and the lowest dimension is flexibility. Respondents' responses to the digital technology variable have an average of 4,742 which is in the very good category. The highest dimension is on digital technical capabilities and the lowest dimension is on a supply chain platform. Of these three independent variables, data visualization, knowledge, and digital technical capabilities are good and have been implemented almost completely within the company.

From the responses of these respondents, it can also be identified that the dimensions that have the highest average value per variable are almost all derived from the new dimensions proposed as a novelty. This means that these dimensions are proven to have been implemented in the company.

Descriptive statistics for the variables can be seen in Table 2. For the five main variables, the average value is close to 5, which means that the respondents responded well to this statement. For company age, it is dominated by 3-8 years, company size is dominated by under 50 employees, ownership is dominated by private companies, and the average number of certifications is 11.792

	Average	Mode
Firm Performance	4.810	-
Digital Culture	4.789	-
Business Intelligence	4.697	-
Accounting Information System	4.770	-
Digital Technology	4.738	-
Age	-	3-8 years
Size	-	Under 50 employees
Certification	11.792	0
Ownership	-	Private

certificates and there are still many companies that do not have digital certification.

Source: Processed data, 2023

4.2. Outer Loadings Test

4.2. Out	1.2. Outer Loadings Test									
	Table 3. Outer Loadings Test Results									
AIS		Ι	BI		DC)T	FP		
X2.1	0.93	X1.1	0.927	Mod1	0.925	X3.1	0.915	Y1.1	0.847	
X2.2	0.927	X1.2	0.964	Mod2	0.944	X3.2	0.928	Y1.2	0.828	
X2.3	0.933	X1.3	0.956	Mod3	0.914	X3.3	0.936	Y1.3	0.871	
X2.4	0.912	X1.4	0.936	Mod4	0.916	X3.4	0.932	Y1.4	0.949	
X2.5	0.919									
X2.6	0.931									

Source: Processed data, 2023

It appears that all variable dimensions have met the requirements (>0,7). The next stage is the construct reliability and validity test.

4.3. Construct Reliability and Validity

t.5. Construct Renability and Valuity								
Table 4. Construct Reliability and Validity Test Results								
	Cronbach'	Composite	Composite	Average				
	S	reliability	reliability	variance				
	alpha	(rho_a)	(rho_c)	extracted (AVE)				
Accounting								
Information	0.966	0.967	0.973	0.856				
System								
Business Intelligence	0.961	0.961	0.971	0.895				
Digital Culture	0.944	0.955	0.960	0.856				
Digital Technology	0.946	0.948	0.961	0.861				
Performance	0.897	0.906	0.929	0.765				

Source: Processed data, 2023

Cronbach's alpha, rho a, and rho c have met the reliability requirements. AVE has also fulfilled the conditions. The next stage is the discriminant validity test.

4.4. Discriminant Validity

Table 5. Discriminant Validity Test Results									
	AIS	Age	BI	Cert	DC	DT	Own	FP	Size
Accounting Information System	0.925								
Age	0.019	1.000							
Business Intelligence	0.930	-0.001	0.946						

	AIS	Age	BI	Cert	DC	DT	Own	FP	Size
Certification	-0.111	0.121	-0.040	1.000					
Digital Culture	0.886	0.020	0.910	-0.090	0.925				
Digital Technology	0.905	0.036	0.867	-0.063	0.835	0.928			
Ownership	0.100	-0.271	0.133	0.047	0.089	0.068	1.000		
Firm Performance	0.781	0.025	0.746	-0.069	0.857	0.739	0.056	0.875	
Size	0.119	0.621	0.050	0.203	0.061	0.096	-0.181	0.110	1.000

Source: Processed data. 2023

It appears that all the criteria for discriminant validity have been fulfilled, namely the number in the diagonal position is greater than the number below it. The next step is to test the coefficient of determination.

4.5. Coefficient Determination Test

Table 6. Coefficient Determination Test Results

	R-square	R-square adjusted
Performance	0.776	0.748
Source Processed data 2023		

Processed data, 2023

The adjusted R-square value is 0.748, which means that 74.8% of changes in firm performance are influenced by business intelligence, accounting information systems, digital technology, digital culture, firm age, firm size, digital certification, ownership, and digital culture interactions, while the rest are influenced by other factors outside the research model. This model provides a strong influence on firm performance. The R-square adjusted value for the model without moderation is 0.741. Not much different but this means that models with moderation can better explain company performance. The next stage is hypothesis testing.

4.6. Hypothesis Test

			21	Standar			
	Hypothesi s	Origina l sample (O)	Sampl e mean (M)	d deviatio n (STDEV)	T statistics (O/STDEV)	P values (1- tailed)	Results
BI -> BP	+	-0.364	-0.343	0.182	2.002	0.023	Rejected
AIS -> BP	+	0.187	0.161	0.241	0.774	0.220	Rejected
DT -> BP	+	0.054	0.047	0.151	0.357	0.361	Rejected
DC -> BP	+	0.974	0.989	0.198	4.924	0.000	Accepte d
DC x BI -> BP	+	0.355	0.356	0.178	1.990	0.024	Accepte d
DC x AIS -> BP	+	-0.397	-0.407	0.190	2.094	0.018	Rejected
DC x DT -> BP	+	0.049	0.054	0.155	0.313	0.377	Rejected
Age -> BP		-0.027	-0.027	0.071	0.386	0.350	
Size -> BP		0.048	0.050	0.066	0.734	0.232	
Cert -> BP		0.034	0.030	0.048	0.704	0.241	
$\overline{Own} \rightarrow \overline{BP}$		0.006	0.001	0.042	0.154	0.439	

Source: Processed data, 2023

The results of hypothesis testing show only the fourth and fifth hypotheses were accepted, while the other five hypotheses were rejected. This means that digital culture increases firm performance and digital culture moderates firm performance through business intelligence. For other hypotheses it has not been proven to be able to increase firm performance and digital culture moderation has not been able to increase firm performance through increased accounting information systems and digital technology.

When looking at the effect size, it can be seen from the value of t statistics, where the bigger the number, the stronger the influence on firm performance. Digital culture is proven to have the biggest influence and for the moderating factor, digital culture x information systems also have the biggest influence.



5. 5. Discussion

5.1. The Effect of Business Intelligence on Firm Performance

Business intelligence has not been able to improve firm performance. This is supported by research (Vugec et al., 2020) with the research sameness that rejects the existence of business intelligence that can improve firm performance but contradicts research (Bach et al., 2018; Ho et al., 2022; Rouhani et al., 2016) and contradicts the RBV theory. An ineffective BI implementation can result in a lack of data integration, a lack of match between business requirements and the BI solutions used, or a lack of management understanding and support of the value of BI. Improper or imprecise implementation can reduce BI's potential to provide significant benefits to firm performance. Complex and unstructured BI implementations can hinder their effective adoption and use by enterprise staff. Inadequate training or difficulties in integrating BI systems with existing systems can also hinder success. As many as 38% of companies have not implemented BI in their business activities and this also causes BI to not be able to improve firm performance. This study is not in line with the RBV theory.

5.2. The Effect of Accounting Information Systems on Firm Performance

Accounting information system has not been able to improve firm performance. This is the same with research (Ali et al., 2016; Hutahayan, 2020; Yixuan & Arumugam, 2021) with the research results that do not support the hypothesis but contradict research (Khalid & Kot, 2021; Latifah et al., 2021; Rouhani et al., 2016) and contradicts the RBV theory. Accounting information systems require accurate, complete, and consistent data. If the system does not ensure adequate data quality, such as data input errors, data duplication, or lack of data security controls, then the information generated by the system may not be reliable or relevant. This can affect a company's ability to make the right decisions and measure performance accurately. If the AIS has a complex or difficult-to-use interface, employees may not make the most of it. This can hinder the adoption of the system by staff who require additional training. As many as 15% of companies have not implemented AIS so AIS has not been able to improve firm performance. This study is not in line with the RBV theory.

5.3. The Effect of Digital Technology on Firm Performance

Digital technology has not been able to improve firm performance. This is the same with research (W. A. Astuti & Augustine, 2022; Nasiri et al., 2020; Renaldo & Augustine, 2022) with the research results that do not support the hypothesis but contradict research (Hanelt et al., 2021; Lutfi et al., 2022; Nguyen & Hoai, 2022) and contradicts the RBV theory. Successful implementation of digital technology requires adequate infrastructure, including stable internet connectivity and good data security. If the company faces challenges such as limited technological infrastructure or high-security risks, then the company's performance cannot increase. Implementation of digital technology without the right strategy can result in undirected efforts. It is important to have a strategic plan that identifies the goals to be achieved with digital technology. As many as 7% of companies have not implemented digital technology are only at the basic level. Implementing digital platforms as a whole is still not feasible for companies, then the use of IoT and digitization has also not been implemented which is evident from the low number of respondents to this statement. This study is not in line with the RBV theory.

5.4. The Effect of Digital Culture on Firm Performance

Digital culture improves firm performance. This is the same with research (Kwarteng & Aveh, 2018; Nasiri et al., 2020; Nguyen & Hoai, 2022) with the research results that do not support the hypothesis and I/O theory, but contradicts research (Ali et al., 2016). Digital culture involves adaptive and flexible attitudes toward change. In a constantly changing business world, companies with a strong digital culture tend to be more prepared to embrace change and take advantage of it as an opportunity for growth. Companies are better able to adapt to changes in technology, markets, and customer needs, which in turn can improve overall firm performance. As many as 86% of companies have implemented a digital culture and its application is carried out for the daily activities of the company and employees, including digital capabilities and digital transformation. This study is in line with the I/O theory.

5.5. Digital Culture Moderates the Effect of Business Intelligence on Firm Performance

Digital culture has succeeded in moderating the increase in firm performance by business intelligence. This is the same with research (Bach et al., 2018; Farida et al., 2021; Vugec et al., 2020) with the research results that do not support the hypothesis but contradict research (Agarwall et al., 2021; Kwarteng & Aveh, 2018). A digital culture that is adaptive and responsive to change is essential in implementing and leveraging business intelligence. The rapid development of technology and the business environment requires companies to continuously monitor their performance and take necessary actions. A digital culture that is responsive to change encourages the use of business intelligence to identify new trends, patterns, and opportunities so that companies can adjust strategies and make decisions more quickly and accurately. As many as 56% of companies have implemented digital culture as well as implemented business intelligence, which means there are still opportunities for performance

improvement if companies are active in improving their implementation.

5.6. Digital Culture Moderates the Effect of Accounting Information Systems on Firm Performance

Digital culture has not been able to moderate the increase in firm performance by the accounting information system. This is the same with research (Kuntari et al., 2022; Kwarteng & Aveh, 2018; Rachmawati et al., 2022) with the research results that do not support the hypothesis but contradicts research (Ali et al., 2016; Hutahayan, 2020; Latifah et al., 2021). A digital culture that is inappropriate or not integrated with the company's accounting information system can hinder its positive influence on firm performance. If the digital culture does not support the effective use of accounting information systems, employees are either not used to using the system or are less motivated to make optimal use of it. The lack of integration between digital culture and accounting information systems can also cause barriers to information exchange and collaboration between different departments.

5.7. Digital Culture Moderates the Effect of Digital Technology on Firm Performance

Digital culture has not been able to moderate the increase in firm performance by digital technology. This is the same with research (Ali et al., 2016; W. A. Astuti & Augustine, 2022; Renaldo & Augustine, 2022) with the research results that do not support the hypothesis but contradicts research (Kuntari et al., 2022; Kwarteng & Aveh, 2018; Pradana et al., 2022). If digital culture is not in line with the company's business strategy, the impact on firm performance through digital technology can be limited. A strong digital culture must be supported by a clear vision and goals related to the use of digital technology. If a company does not have a clear strategy or alignment between digital culture and digital initiatives, then the expected benefits of digital technology may not be realized.

6. Conclusion, Implication, Limitation, and Recommendation

6.1. Conclusion

The conclusion of this study is that only digital culture can significantly increase firm performance and digital culture moderates the increase in firm performance by business intelligence. As for other variables, the hypothesis are rejected. Digital culture has the greatest influence on firm performance. Digital culture can also be useful in increasing firm performance.

6.2. Implication

For theoretical implications, researchers can develop or adapt a conceptual framework that allows them to more comprehensively analyze the interaction between digital culture and company performance. This will contribute to our understanding of how digital culture factors interact with each other and influence various aspects of performance.

For practical implications, digital culture and business intelligence can improve firm performance both through direct influence and interaction. Companies must be able to implement digital culture and business intelligence optimally in stages. It can be started by improving human capabilities and innovation capabilities for digital culture and data processing and visualization for business intelligence. Gradually implementing it, it is believed that it will help the company's activities and ultimately improve its performance, including the firm's digital performance. A strong digital culture drives the adoption of new technologies and changes in the way things work. Employees feel more comfortable dealing with new technologies and adapt quickly to new tools that increase productivity and efficiency. Managers and policymakers can try to apply it for the betterment of the company.

6.3. Limitation

The limitations of this research are respondents who have difficulty filling out the questionnaire due to limited understanding of indicators of business intelligence which are new terms for them. Of the 500 questionnaires distributed, only 250 respondents were successfully obtained within 3 months. Another

limitation is measuring digital culture using a questionnaire, it is possible that the questionnaire does not fully cover all relevant aspects of digital culture. There may be dimensions of digital culture that are difficult to measure or represent well in the measurement tools used. This study uses a crosssectional study design, in which data collection is still in 1 period only.

6.4. Recommendation

Recommendations that can be given to companies are that implementation must be carried out immediately so that the company's competitiveness can continue to excel in the market. Recommendations for future research can use other factors such as the application of green, leadership, innovation, sustainability (Rinkevičius & Miečinskienė, 2023), and other factors that can improve firm performance, especially digital performance. Researchers can also develop new instruments that can measure digital culture more accurately. Subsequent research can also make a design study in the form of longitudinal data.

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