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A SYSTEMATIC LITERATURE REVIEW INFORMATION TECHNOLOGY SOPHISTICATION: CAPITAL AND PERFORMANCE

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ABSTRACT
This study aims to conduct a literature review in the field of technological sophistication with data from all international research publications in the field of accounting information systems. The relevant data in this review were obtained from 50 articles from 1994 to 2022 globally. The results of research in many articles that discuss the relationship of information technology in improving company performance, various results methods describe the relationship between Information Technology business and strategic alignment. So that in this alignment strategy emerges important attention to the views by business and IT (Information Technology) executives around the world (Raymond and Coretau, 2009, Johnson and Lederer, 2010). The purpose of this article is to add a detailed literature review so that it can be used by academics and practitioners in understanding the resources needed to maximize technological sophistication. This can be obtained by exposing information technology literature related to company performance. It is hoped that this article will be useful for ongoing discussions regarding sophistication of technology in companies.

Keywords
Information Technology Sophistication; Performance; Evaluation; Capital; Company

INTRODUCTION

At this time business companies prefer to invest in Information Technology such as hardware and software, network, data integration to be able to improve company performance (Velcu, 2010). But from the research results there is a mixed relationship between Information Technology and Company Performance, several studies show IT alignment as a construction that improves company performance (Croteau & Bergeron, 2001; Kearns & Lederer, 2001; Luftman, 2004; Sabherwal & Chan, 2001). There are only a few research results that link strategic alignment with the results of Information Technology sophistication. Researchers show strategic alignment has a strong relationship with firm performance (Sabherwal & Chan, 2001), competitive advantage (Kearns & Lederer, 2001). From the results of research in general it is found that strategic alignment affects the sophistication of information technology so that Information Technology can mediate the relationship between strategic alignment and organizational performance. This article extensively reviews whether there is a relationship between information technology and the contribution of company performance or the need for other organizational factors such as the use of investment with the company's business strategy so that this article can explain the extent to which information technology sophistication improves company performance.

The productivity paradox is a strong relationship between investment in information technology sophistication and performance. Researchers in this field have tried to examine the effect of investing in information technology sophistication and organizational performance in the economic (Al-Eqab & Adel, 2013; Santhanam & Hartono, 2003). The researchers explained that investment in information technology sophistication includes hardware, software, telecommunications and networks (Dedrick et al., 2003). Here Dedrick et al. (2003) also stated that economic performance at the economic level refers to economic growth,

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labour productivity and social welfare. Economic growth in a country is calculated from the rate of change in real and gross GDP (Gross Domestic Product). Evaluation of this growth on labour productivity and other resources efficiently to create added value. So that it can be stated that social welfare is achieved when the market provides goods and services at a lower cost than the income of the people in that country.

Matrix of economic performance in industrial sectors such as financial measures, labour productivity and profitability. The issue in this article is related to the business value and organizational impact of investing in information technology sophistication. This literature study uses two approaches, the first contains literature that studies the direct relationship between investment in information technology sophistication and company performance such as Bakos and Treacy (1986) at the economic, industrial and organizational levels. And the second approach includes empirical studies that examine the indirect relationship between information technology sophistication and company performance.

Current macroeconomic research shows that company investment in information technology sophistication has an impact on increasing labour productivity and boosting the economy. As stated by Roach (1987) that there is an impact of information technology sophistication on increasing the productivity of information and production workers in the computerized field and less on economic performance. Baily and Chakrabarti (1988) found that there was no correlation between investment in information technology sophistication and productivity. They explain this occurs when the production of dense information results in a fall in the price of information technology where this is a decrease in performance.

Likewise Loverman (1988) in the study period 1987 to 1984 stated that several manufacturing sectors did not experience an increase in performance towards investment in information technology sophistication. In addition, Starssmann (1990) found no relationship between investment in information technology sophistication and increased performance productivity. However, Dedrick (2003) found that there is a positive relationship between investment in information technology sophistication on Gross Domestic Product (GDP) and increased productivity. A difference in that as many as forty-three samples stated that investment in information technology sophistication did not significantly increase the presentation of Gross Domestic Product (GDP) or productivity growth (Dedrick et al., 2003).

Meanwhile, Litan and Rivlin (2001) found that information technology sophistication contributed to increased productivity. From their test, there were eight industrial sectors that contributed 70% to the increase in the country's Gross Domestic Product (GDP). They also found that the impact of information technology sophistication for five years could increase productivity growth from 0.2% to 0.4%. In the study of Navarrette and Pick (2002) with a time series of eleven years tested the effect of technological sophistication investment on three dimensions of performance measurement, namely net income, return on assets (ROA) and return on equity (ROE). They found that there was a positive relationship between investment in information technology sophistication on industry net profit and return on assets (ROA).

At the company level, research by Shannak (2010) found that investing in information technology sophistication in small-categorized banks was more successful in improving financial performance compared to large-categorized banks. At that time they thought it happened because small banks were lagging behind in information technology. Research on spending accumulation for 4 (four) years, they found that banks that are large for information technology sophistication correlate with greater profitability than smaller banks. better service and competitive prices increase company performance towards information technology sophistication, but not linearly towards increased profitability (Eliyana & Agustina, 2021). They argue this is because consumers lower costs for purchasing low-cost products and services and consumers prefer new suppliers. Thus lower prices paid by consumers for lower cost products and services can reduce profitability.

Based on the results of this study, it can be seen that investment in information technology sophistication has a positive correlation with business performance, especially in the return on asset (ROA) parameter. So the findings in this study can be interpreted that financial performance can be significantly influenced by variations in the relationship between information technology, business strategy and other competitive metrics throughout the company. The study also emphasizes that the integration of these contingencies can explain the correlation between investment in information technology sophistication and financial performance. At the company level, it can be seen that investment in information technology sophistication is influenced by organizational structure, business strategy and implementation of company practices. Mohamad (2017) states that investing in information technology sophistication has better

management quality to improve firm performance. Tallon et al. (Tallon et al., 2000) alignment of information technology sophistication with business strategy can increase the investment value of information technology sophistication itself.

In simple terms, it can be seen that previous research was not able to capture the positive effects provided by investment in information technology sophistication, while recent research has shown more positive results. The researchers also noticed that yields were higher in manufacturing companies than in the service sector. According to Brynjolfsson and Hitt (2000) that previous research did not have sufficient data for investment in information technology sophistication and the sample size was relatively small. Brynjofsson (2013) provides 4 (four) reasons for investing in information technology sophistication in improving organizational performance including: there are errors in the measurement of input and output variables in different studies; there is an effect of lagging behind information technology due to the process of adjustment and learning; there is a loss of profits and returns on the distribution of profits and mismanagement of information technology sophistication and management errors imitating other company investment decisions without paying attention to important information such as the negative effects of adoption which can affect the organizational structure. Then Cidik (2019) also suggest further research on how investing in information technology sophistication can be more effective and efficient which can identify independent variables such as growth and innovation as well as organizational structure and business processes.

Many researchers conducted research on the relationship between strategic alignment and company performance, finding that there is a positive relationship between strategic alignment and organizational performance (Antoni et al., 2020; Dong et al., 2008; Ellitan, 2017; Sabherwal et al., 2019; Wu et al., 2015). Al-Busaidi (2010) tested a survey method of 244 academic institutions in the USA to test whether company performance was influenced by alignment between organizational strategy and information technology sophistication and found a positive relationship between alignment and performance.

There is a positive relationship between the level of strategic alignment and performance and business strategy and Information System (IS) strategy have a positive impact on performance (Chao & Chandra, 2012). They also found that Information System (IS) strategic alignment, business and Information System (IS) effectiveness had a positive relationship to performance. However, their research did not clearly show profit and loss statements, so their research used subjective business performance data. Dong et al. (2008) examined the relationship between business strategy, Information System (IS) strategy, strategic Information System (IS) alignment and performance. The research method was conducted using a five-point Likert scale based on two perspectives, namely market growth related to competition in the last three years and profitability. The results show that there is a negative relationship between business strategy and business performance but there is a positive relationship between alignment strategy and performance.

In this article there are 2 (two) questions that need to be discussed, namely whether the alignment of Information System (IS) plans with business plans is correlated with information technology sophistication for competitive advantage by Information Technology (IT) executive staff and other senior executives and secondly whether business plans in line with the Information System (IS) plan regarding the use of information technology sophistication for competitive advantage by Information Technology (IT) executive staff as well as by other senior executives. Evaluation of competitive advantage, such as how far the benefits of the Information System (IS) are for creating cost efficiency and product differentiation, for making available business strategies effective and for creating new business strategies.

Tayeh (2015) found that small companies that align strategy with performance will be more successful. The company performance measured here against managers' ratings in relation to competitors, including long-term profitability, financial resources, sales growth (sales growth), corporate image and customer loyalty. Using questionnaire data from 250 companies, the authors find that small companies with a high level of alignment achieve better company performance.

Yayla (2012) found alignment as a cooperative method between business strategy and information technology strategy. In their research with a total of 505 questionnaires from the field of Information Technology (IT) and business managers in the manufacturing, telecommunications and information services sectors. The aim of this research is to examine the effect of alignment strategy on business performance. Performance measurement is assessed using a five-point Likert scale questionnaire, looking at how far the

company's performance is in productivity, cost efficiency, innovation capability, reactivity to business, responsiveness to customer needs and relationships with business partners. From their research it was found that a higher level of alignment results in higher performance.

Likewise with Sabherwal (2019) conducted research on 84 Information Technology (IT) managers empirically in testing strategic alignment on the relationship between investment in information technology sophistication and firm performance. Performance indicators are assessed subjectively by observing the Information Technology (IT) Manager's estimate of IT spending over the last 3 years against annual spending on personnel, hardware and software costs. As well as the Manager was asked to estimate the income before tax and profit per employee for the past year. In this study it was found that strategic alignment directly affects company performance as well as a moderating (strengthening) variable between investment in information technology sophistication and performance.

The results also vary in research on the relationship between strategic alignment of Information Technology Sophistication (information technology sophistication) and company performance (Croteau & Bergeron, 2001; Sabherwal & Chan, 2001). The authors found that aligning company strategy with the use of information technology sophistication had a very high effect on performance levels. The authors also found that companies in the mining sector were more dominant in using information technology sophistication to expand product innovation and market opportunities Research Croteau and Bergeron (2001) observed a subjective measure of organizational performance by asking respondents how the company's performance compared to other companies in the same market over the past 5 years related to profitability, sales growth, liquidity and capabilities, investment.

The researchers also found that strategic alignment affected performance when they used the gestalt, covariance, mediation and deviation approaches. However, no effect was found when done with the moderation method. There is research showing that strategic alignment and accounting performance in accounting firms have a negative relationship (Evans et al., 2019; Li & Ye, 1999; Palmer & Markus, 2000).

Flexible automation involves more use of technology in product design and manufacturing activities (Kotha & Swamidass, 2000). Researchers used data from 87 flexible automation users in the US and Japanese and German companies, found that strategy alignment had a positive effect on sales growth but had no effect on the return on investment. Li and Ye (199) examined another hypothesis variable, namely whether information technology sophistication that is increasingly integrated with strategic management will improve company performance. They use indicators Return on Assets (ROA), Return on Sales (ROS) as a measure of company performance. Thus, the study aims to conduct a literature review in the field of technological sophistication with data from all international research publications in the field of accounting information systems

METHODS

This article uses literature studies from various papers in the Scopus journal with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) rules which can be seen in the flowchart of Figure 1.

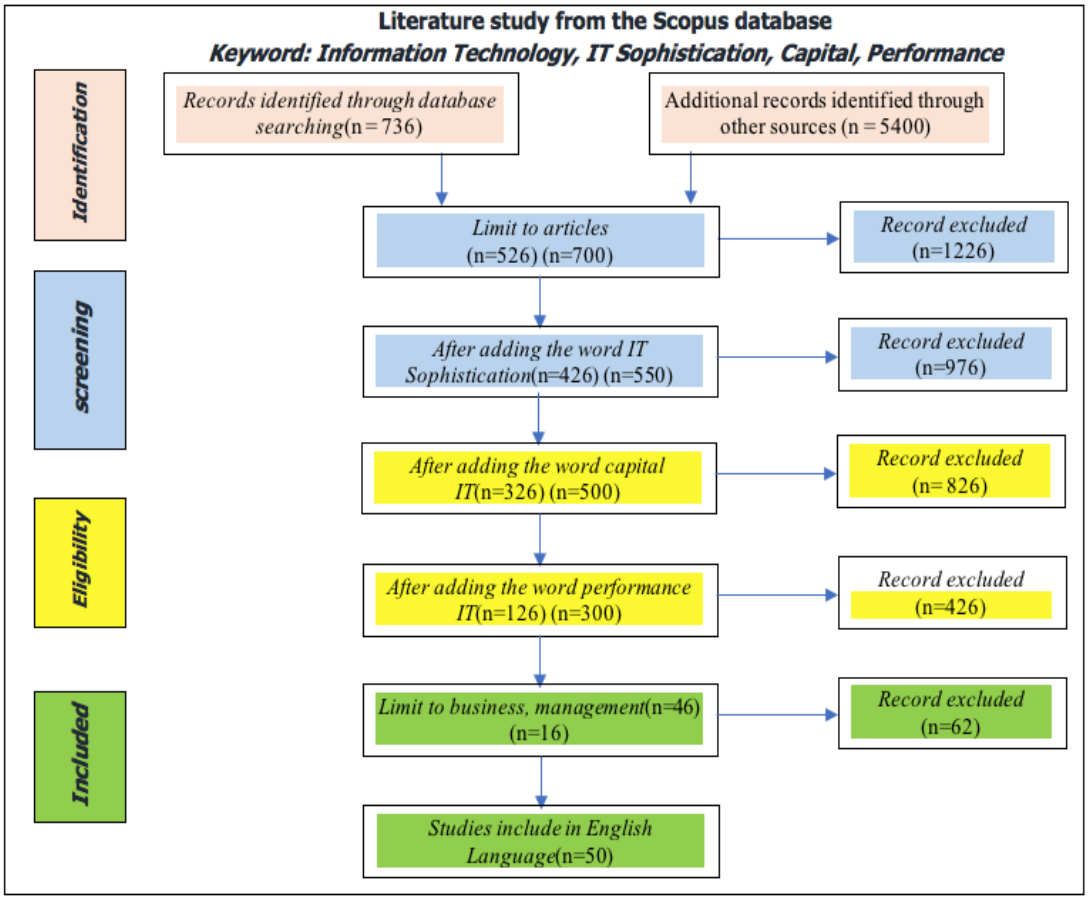

Figure 1. Flow chart of article writing literature with the PRISMA rules

Figure 1 shows the mechanism and search protocol for indexing journals such as Scopus. Then a search was carried out in the database using the keyword Information Technology Sophistication and the results were 736 articles. Then added the syntax title-abs-key (Capital IT) to obtain 526 articles, the next step is to add performance IT to obtain 126 articles and add the syntax (limit-to (doctype, "ar")) to obtain 46 articles. Then added the syntax title-abs-key (information and technology and sophistication and capital) and and (IT business) and (Performance) and (limit-to (doctype, "ar")) to get 50 articles.

RESULTS

In the collected research, it was found that strategic alignment correlated with profit on assets and profit on sales. This occurs when controlling a dynamic organizational environment. Palmer and Markus (2000) conducted a survey of 80 professionals to observe the effect of strategic alignment as a moderating variable that strengthens the relationship between corporate business and information technology strategy on organizational performance. Performance is assessed using operating ratios such as profitability, sales growth, sales per employee (to measure the effectiveness of employees/ sales staff), sales per square meter (to measure intensity towards a particular store) and stock returns (to measure the amount of inventory sold). In their research found no positive relationship between alignment and performance. The author finds that a negative relationship states that retail sector companies do not require strategic alignment, only low-level alignment can focus on internal business and information technology sophistication only for company business transactions.

Business performance is assessed by subjective measures such as growth and profitability and objective measures, namely return on assets. Business strategy is measured by Venkatraman's typology (1989), namely aggressiveness, analysis, defense, future, proactive and risk. The researcher also developed a twenty-item instrument on a seven-point scale, ranging from 1 (major weakness) to 7 (major strength), to measure information management technology (SITM), which consists of five factors: the position of the information

system (the role and contribution of IS to organization goals); strategic use of IS (application to gain competitive advantage); new IT applications (adoption of new technology); architectural planning (data, technology and system architecture); and data security (data security,

Business strategy and information technology sophistication management have negative and positive impacts on performance (Smith et al., 2013). Management of strategic information technology sophistication has a negative effect on growth and profitability, but shows a positive effect on ROA in companies that have a strong business strategy. Researchers point to mixed results for short and long term effects. This means that information technology sophistication management shows a faster effect in increasing ROA and long-term business strategy can increase company sales and profitability. It can be concluded temporarily that several studies examine the relationship between strategic alignment and subjective performance of the company.

Research results that state a positive relationship such as (Dong et al., 2008; Kearns & Lederer, 2001; Sabherwal et al., 2019). In addition, several studies have investigated the relationship between strategic alignment and objective accounting/office market performance (Brettel et al., 2016; Li & Ye, 1999; Palmer & Markus, 2000). whereas some studies (Bergeron et al., 2013) investigated the relationship between alignment and firm performance using perceptual and objective performance measures. The causal relationship between investment in information technology sophistication and company performance is difficult to apply and is still mixed up. The mixed results demand further examination of the factors influencing company performance. When compared in the field of Information Technology Management Systems, company performance is measured using two dimensions: (1) operating performance, and (2) market-based performance. Where operational performance uses the ratio of profitability and productivity performance. Market-based performance is measured using a rating scale that rates companies in new markets and bringing new products and services to the market (Ravichandran et al., 2005)

So that for future research should investigate the problem of operating performance and market-based performance by examining other key ratios taking into account using Tobin's Q. For example, Tanriverdi (2005) finds that information technology sophistication is related to increasing firm capability, which in turn improves firm financial performance. In Tanriverdi (2005), measuring financial performance uses accounting-based objective measures Return on Assets (ROA) and market-based performance (Tobin's Q) as well. In addition, some researchers use the Tobin's Q ratio as a measure of market performance. The Q ratio was introduced by James Tobin in 1969 as a predictor of a company's future investment (Mithas & Rust, 2016). The Q ratio is the ratio of the market value of a company's debt and equity to the replacement cost of current assets. Furthermore, Bharadwaj et al. (1999) argue that the Tobin's Q ratio, which is seen as a measure of the future that reflects the performance effect of investments in information technology sophistication, may reflect the evolution of intangible firms, such as product and quality improvements.

In other words, companies with a high Q-ratio tend to be companies with attractive investment opportunities, or significant competitive advantages. This paper presents several studies on the impact of investment in information technology sophistication and business information technology partnerships on performance. Thus, it is hoped that this paper can produce research that can provide a better understanding of how managers manage investments in information technology sophistication, strategic alignment that can affect company performance.

Findings in the field of Accounting Information Systems such as Abd Mansor (2016) on state-owned banking respondents in Indonesia found that information technology sophistication had a significant effect on improving the company's financial performance. Many countries have streamlined aspects of Information Technology (IT), namely the use of IT and IT management in the smooth operation of Goods and Services Tax (GST). Likewise, Ali (2017) found that the sophistication of the marketing Information System (IS) has proven to have a positive impact on the bank's core competencies. Salleh (2010) found that IS sophistication has a significant effect on all three dimensions of performance measures. However, more impact was seen for finance-based actions and innovation-based actions than for customer-employee based actions. Previously de Búrca (2006) found that IT sophistication moderates the performance service practice relationship. From a number of articles presented in this paper, several relevant articles are reviewed to find out the development of information technology sophistication research on investment costs and improving company performance as can be seen in Table 1.

Table 1. Reviewed Articles

No.	Researcher, year	Country	Title	method	Results
1	L. Raymond, G. Pare, and F. Bergeron (1995)	Canada	Matching information technology and organizational structure: an empirical study with implications for performance	Questionnaire	-The more sophisticated the organizational structure, the greater the impact of IT sophistication on performance.
2	Mark Colgate (Mark, 2000)	English	Marketing and Marketing Information System Sophistication In Retail Banking	Questionnaire	IT is increasingly being used by banks in an effort to gain sustainable profits. The IT that supports the marketing function is becoming increasingly important as most of the other IT applications that emerge through the marketing function develop quickly and are easy to replicate.
3	Guy Pare, Claude Sicotte (Paré & Sicotte, 2001)	Canada	Information technology sophistication in health care: an instrument validation study among Canadian hospitals	Combination of questionnaires and interviews	No relationship was found between the level of sophistication and the perceived usefulness of administrative applications in Quebec.
4	Louis Raymond and Jose´e St-Pierre (2005)	Canada	Antecedents and performance outcomes of advanced manufacturing systems sophistication in SMEs	SME producer data survey which is then analyzed by structured equation modeling.	Information technology in more advanced manufacturing is only present in one-fifth or less of the sample companies, indicating that information technology sophistication has not yet achieved wide expansion in manufacturing SMEs.
5	Seán de Brca Brian Fynes Teresa Brannick (2006)	Ireland	The moderating effects of information technology sophistication on service practice and performance	Questionnaire survey with variable measurement using a five-point Likert Scale	IT sophistication moderates relationship performance service practices. Obtained a positive relationship between service practices and service performance
6	Noor Azizi Ismail (2009)	Malaysia	Factors Influencing AIS Effectiveness Among Manufacturing SMES: Evidence From Malaysia	The distributed questionnaires were refined in three stages to SME managers	The sophistication of Accounting Information Systems (AIS), the participation of managers in the implementation of AIS, the knowledge of AIS managers, the effectiveness of consultants, and the effectiveness of government agencies appear insignificant.
7	Noor Akma Mohd Salleh Ruzita Jusoh Che Ruhana Isa (2010)	Malaysia	Relationship between information systems sophistication and performance measurement	Self-administered questionnaire survey with Scale Likert	IS sophistication has a significant effect on all three dimensions of performance measures. However, more impact was seen for finance-based actions and innovation-based actions than for customer-employee based actions.
8	Louis Raymond,	Canada	The Strategic Role of IT: An Empirical Study	Distribution of questionnaires	The strategic role of IT has no direct effect on the

No.	Researcher, year	Country	Title	method	Results
	Anne-Marie Croteau, François Bergeron (2011)		of its Impact on IT Performance in Manufacturing SMEs	about strategic orientation	sophistication of IT use; but has an indirect effect through the sophistication of IT management
9	Maziyar Ghasemi, Vahid Shafeiepour, Mohammad Aslani, Elham Barvayeh (2011)	Iran	The impact of Information Technology (IT) on modern accounting systems	Questionnaire survey	The use of information technology to perform accounting functions brings opportunities for companies to move towards paperless activities. Electronic data exchange and electronic fund transfers can provide opportunities for companies to implement production systems more effectively and save money.
10	Gregory L. Alexander, Linsey M. Steege, Kalyan S. Pasupathy (2015)	USA	Case studies of IT sophistication in nursing homes: A mixed method approach to examine communication strategies about pressure ulcers	Observations collected during interactions between nursing staff.	Communication systems in high IT sophistication facilities have created backup systems such as electronic status boards where interventions occur observable by everyone at any time during the shift.
11	Mahmoud Al-Eqab, Kingdom of Saudi Arabia Dalia Adel (2013)	Saudi Arabia	The Impact of IT Sophistications on the Perceived Usefulness of Accounting Information Characteristics among Jordanian Listed Companies	Questionnaire distribution	There is a significant and positive relationship between the four dimensions of IT sophistication and accounting information characteristics, also the findings from this study indicate that managerial, informational, and functional IT sophistication is more important than technological aspects in influencing the perceived usefulness of accounting information characteristics.
12	Valeria Hart (2013)	USA	Hospital IT Sophistication Profiles and Patient Safety Outcomes: A Comparison of Three States	Questionnaire distribution	A positive relationship was obtained between hospital IT sophistication and patient care outcomes using the AHRQ safety indicator
13	Sambas Ade Kesuma, Siti Zabedah Saidin, Aidi Ahmi (2016)	Indonesia	IT Sophistication: Implementation on State Owned Banks in Indonesia	Questionnaire distribution	In relation to the level of participation in Information Systems development, the results show 53.6% (moderate), 33.9% in (high participation) in planning information systems. As much as 43.2% (high participation) and 42.6% (moderate) in terms of participation in developing applications. As much as 47% high participation and 42.1% moderate participation in the elaboration of the development schedule. In the elaboration of the development budget, around 44.3% of respondents

No.	Researcher, year	Country	Title	method	Results
					indicated high participation and 42.6% moderate.
14	Nor Hafizah Abd Mansora, Intan Salwani Mohameda, Lai Ming Linga, Nawal Kasima (2016)	Malaysia	Information Technology Sophistication and Goods and Services Tax in Malaysia	A combination of information obtained from interviews and information available from various sources.	The application of the Goods and Services Tax (GST) or Value Added Tax/VAT in one country to another varies greatly. However, almost all countries have streamlined aspects of Information Technology (IT), namely the use of IT and the management of IT in the smooth operation of GST.
15	Mohamed Salih Yousif Ali (Ali, 2017)	Australia	Moderating effect of support service quality on marketing is sophistication and bank's core competencies	Questionnaire with Likert Scale	marketing information system (IS) sophistication has proven to have a positive impact on bank core competencies with a low to moderate marketing IS sophistication range.
16	Murtaza Masood Mustafa, KK Goyal (2020)	India	Diversity of Information Technology Management Sophistication in Financial Service Industry	Technology Management Literature Study	The most important contribution that influences IT Management Sophistication is identified in the financial services industry, namely IT planning, IT organization, IT control, and IT leadership. Most of these main findings confirm with the findings of past research. For example IT planning, IT organizing & IT control have been identified as the three main dimensions that define IT management

CONCLUSION

Based on the results of the literature review, it can be concluded that there is a mediating relationship between the capability of capital information technology sophistication and performance. So systematically, it can be concluded that there is a significant influence of information technology sophistication capital on organizational performance. This contributes to knowledge implications, research. This paper proposes a convergence classification consisting of publications in the field of Information Technology and Performance capital, so as to be able to characterize the collection of knowledge generated from each period.

As an implication for its application, it is necessary to identify the main themes in the areas of capital and Information Technology Performance that lead to an understanding of the development of studies to better understand the topic and general context, as well as research gaps. Furthermore, new studies can be directed to overcome the lack of previous research and advance knowledge in the field of information technology sophistication. The results of the literature review in this paper also strengthen the results of previous research, where information technology sophistication plays a role in strengthening its relationship with company performance. This means that increasing the ability of Information Technology Sophistication will increase the ability of organizational learning that affects company performance.

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