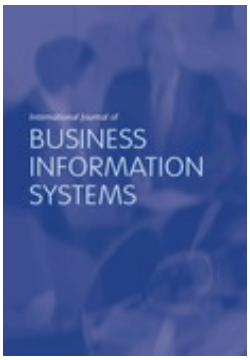

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Effect of intellectual capital and information system capability on effective strategic decision making to achieve financial performance

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Effect of intellectual capital and information system capability on effective strategic decision making to achieve financial performance

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Abstract: This study analyses the importance of intellectual capital and information system capability applied in state-owned companies in Indonesia, influencing the company's financial performance through mediating variables. Using the theory of resource-based view (RBV) and bounded rationality to investigate these relations, a series of hypotheses are developed, considering effective strategic decision-making as a mediator variable. The study analyses structural equation modelling (SEM) derived from empirical data from 106 companies in Indonesia. The study attempts to precisely analyse how the impact of intellectual capital and information system capability on established state-owned companies in Indonesia is affected by effective strategic decision-making. The research exposes that information system capability does not influence financial performance, whereas intellectual capital and information system capability indirectly leverages financial performance through effective strategic decision-making.

Keywords: intellectual capital; information system capability; ISC; effective strategic decision making; financial performance.

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1 Introduction

Digitalisation in Industry 4.0 resulted in rapid and continuing market growth. Industry 4.0 describes a technique to move from dominant machinery to digital output. In order to achieve an effective transition of the Industrial 4.0 standard, the main elements of a concrete future business climate must be clearly recognised. Industry 4.0's characteristics are based on heterogeneous data and the convergence of information to meet the agile and complex development requirements and increase the performance of the entire industry. Industry 4.0's goal is to improve operating efficiency and productivity as well as the automation level (Thames and Schaefer, 2016). It is combining of ten significant innovative technologies that are

1 sensors, and machine intelligence algorithms

2 autonomous robots

3 big data, analytics, and integration

4 simulation and digital twin

5 the industrial internet of things

6 cybersecurity

7 the cloud and edge computing

8 additive manufacturing

9 augmented and virtual reality

10 human-machine cooperation (Kumar and Gupta, 2020).

These features are not only very much related to internet technology and advanced algorithms, but also suggest that Industry 4.0 is a technological method for adding value and managing information.

In addition, the fourth industrial revolution put great pressure on industries and companies to maintain their competitiveness by keeping updated with recent developments in information system (IS) and technology capabilities infrastructure that establishments indicate their preference to prioritise industrialisation such as connecting machines and generate data analytics using IoT, cloud and big data and establish the basis of further interventions (Sundram et al., 2018; Dutta et al., 2020). In the development and production functions, intervention is very often needed, where other Industry 4.0 technologies are implemented that promote efficient outcomes that have an effect on business expectations. Companies draw on the comprehensive information opportunity,

based on pace, cost and range, through technology management (Zeng and Pathak, 2003). IS capability will help to improve visibility within supply chains and networks, allowing businesses to introduce suitable IT technologies so thereby incorporate and strengthen decision-making processes (Christiaanse, 2005).

Changes in business variations in the internet world of this information encourage firms to make policy choices quickly and accurately in particular state-owned corporations in Indonesia. They play a vital role in digitalising the economy by implementing their offers, efficiency gain, and customers' attraction. Compared to local and global digital leaders, Indonesia's state-owned enterprises have relatively lower digital maturity (AT. Kearny, 2020). Annual digital investment in these entities would need to triple over the next four to five years to ensure that they could catch up with advanced ASEAN economies. The World Bank reported in July 2020 which digital adoption by the State-owned companies in Indonesia is lagging compared to other Southeast Asian countries, which measured 0.39 in 2014 and 0.47 in 2016. Their digital governance transformations progress is slow, and services are delivered in status quo because of the capability to develop and operate digital services (failed on performing user research and services design), to manage IT infrastructure (the plan to build a dedicated government IT infrastructure is currently under-resourced and a clear development plan is not yet available, and to transform service.

In principle, as IT provides industrial companies with an ongoing changing business environment (such as its impact on information exchange capacities), more research is needed to investigate how IT activities affect cross organisational relations and achievement (Bocconcelli et al., 2017; Karjaluoto et al., 2015). The resource-based view (RBV) states that competitive advantages depend on internal aspects of a company (Barney 1991; Aboyassin and Abood 2013). However other scholars have shown that IT cannot generate lasting improved performance because of poor income (Rehman and Hussain, 2013) and failure of the IS (Chae et al., 2014, Chae et al., 2018; Aydiner et al., 2019). In addition firms fail to achieve improved performance after cross-organisational information sharing via IT capabilities has been implemented (Sundram, 2012; Hutahayan, 2020). IS capability is the varied procedure which flexibly describes the impactful conversion into outputs by an enterprise as a combination of resources and expertise (Ravichandran and Lertwongsatien 2005). Therefore, it creates a wider perspective of a company by merging sources and skills for higher performance. Consequently, this study shows inconsistent findings about the possible ways that IS capability may impact on financial performance of Indonesian state-owned companies.

However, the 2019 McKinsey survey on the topic of Digital banking in Indonesia revealed the irony that most digital transformations carried out by state-owned banking companies have failed to achieve financial performance goals. Research shows that 70% of complex, large-scale digital innovation change programs do not achieve their goals. The problem faced is the lack of mastery of information technology and the delay in responding to the increasingly innovative steps of financial technologies player as new competitors.

Information and knowledge control the information age. Human capital's role is also increased by the value of the organisation (Abhayawansa and Abeysekera, 2008; Hong et al., 2007; Wang et al., 2015). The managerial accomplishment is influenced significantly by the organisation's determination to maximising intellectual capital's (ICs) significance (Harrison and Sullivan, 2000). Bontis et al. (1999) affirmed that the connection between IC and business performance is positive and substantial. IC must

meet specific strategic criteria to such an extent as the critical elements of an improvement firm. To achieve a competitive advantage, its strategy requires some human resource competencies (Wickramasinghe and Zoyza, 2009). As the globalised world has come, corporate growth and success have undergone turbulent changes and the role of intelligent capital to obtain greater outcomes is more important (Nahapiet and Ghoshal, 1998; Serenko and Bontis, 2013; Stewart, 1997). The RBV defines those competitive advantages depend a firm's internal elements or capabilities (Barney 1991; Aboyassin and Abood 2013). Although there is much academic research into and impact on IC, previous research could not yet demonstrate why certain companies with qualified senior management teams, high-quality institutional mechanisms and management of ISs have still been unsatisfactory in their financial performance. Most of the older employee displayed a lack of interest and willingness to learning computer skills which have a high negative impact on the operation of the organisation (Ossai and Degoke, 2014). Companies with the relatively similar IC level might not benefit equally, as they differ in the capacity to sensitise, seize and restructure the capital (Hsu and Wang, 2012; Hutahayan, 2020). Consequently, this study shows inconsistent findings about the possible ways that IC may impact on financial performance of Indonesian state-owned companies.

The concept of bounded rationality theory is, therefore, when making critical decisions, the tractability, cognitive limits and the time allotted for decision-making process is limited to rational thinking (Simon, 1977). Informational distortion provides a key function in adverse decision-making, since the idea of restricted rationality may even require links to information at some stage. The provision of more accurate and reliable data should support effective decision-making, and the ability to forecast will increase policymakers' ability to make more effective and comprehensive decisions, and then to achieve the organisation's goal (Huber 1990).

We address these gaps based on bounded rationality perspective through effective strategic decision-making (ESDM) as mediator on the relationship between the IS capability, and IC on financial performance. This makes the firm a tool for strategic decision-making to use its incorporated IS play a crucial role in facilitating the effective operation of the work to better, more efficient and productive work practices. IS capability plays a key part in making judgement. Managers cope with highly substantially structureless assignments and, despite the high level of uncertainty, have to make decisions (Islei et al., 1991). Technology reduces the time expended toward information review. Insufficient of ISCs, companies are not making the necessary choices in time compared to their competitors. The duration and dedication taken to take decisions can be minimised using technological resources and related systems. This increases information capacity of managers in the decision-making process in order to accomplish their organisation targets (Huber, 1990).

There are several contributions to this research. Firstly, the specification of ISCs and IC allows RBV theory to explore the financial performance of stated companies in Indonesia more effectively. Second, the mediating role model is intended to regard the impact on the relation between IS capability and IC and financial result by ESDM. Thirdly, this research is considered essential for the policy-making process, significantly for managers to leverage companies' financial performance in Indonesia.

2 Literature review

2.1 Theory of bounded rationality

In practice, theory of bounded rationality indicated that decision-making seeks the best form or option in all circumstances in current hypotheses that have been affirmed by decision-makers (Simon, 1957). This is called as the theory of bounded rationality that people are reasonable by intention. Owing to information processing and knowledge limitations, they are constrained in their comprehension. Any organisation would rarely be able to store all potential solutions for a particular problem with the usage instead of seeking to optimise for a solution (Desouza et al., 2003).

In this method, general objectives (measured by the quantitative outputs) are established for system first; then the smaller targets or outputs for the individual component functions are defined and associated and then the inputs necessary for each function to be performed are described (Desouza et al., 2003). Changing the system's overall performance triggers the chain reaction of adjustments to previous outputs and allows functions at the end of the process to operate on new information inputs. In reality, the need to work on new and new information inputs for organisations grows rapidly in the evolving and unpredictable market climate in which the performance of organisations is challenged every day. But the ability to handle the new information created within the organisation is very limited for an organisation as a whole. The organisation is limited to a predefined smaller set of information inputs and only operates on inputs within limits in order to achieve such satisfactory outcomes rather than optimised outputs.

Drawing upon theory of bounded rationality, ISCs and IC also minimise an organisation's level of hierarchy throughout decision-making and contribute to quicker and more exact recognition of challenges and/or possibilities (Han and Li, 2015). For example, both purchasing and procurement managers have inadequate knowledge of all contract terms and conditions. This limited rationality would eventually include further adaptation because after signing, the agreement would have to be amended. For example, IS capability usually does an algorithm search by the decision-maker who sets out his expectations gradually and stops the first 'satisfactory' decision he finds (Pomerol and Adam, 2003). Precise prediction greatly increases the transparency and decision-making capacity; managers may therefore focus on more important factors (Islei et al., 1991). Efficient decision-making also contributes to the implementation and development of successful new products and services through latest tech (Baum and Wily, 2003), helping to increase business process efficiency.

2.2 Theory of RBV

The RBV says that for such internal aspects (resources) within the organisation a sustainable competitive advantage needs to be achieved. The RBV concentrates on the resources and capability that decide the success of the organisation. Sources comprising of assets, knowledge and skills decide the mechanism of empowerment to develop productivity and business. Resources can be generally described as firm-controlled properties, business processes, characteristics of the company, information and expertise that can be used to establish and execute its strategies (Barney, 1986). In addition, the business is a set of capital, talents and skills. Unlike its rivals, variations in the capital,

capabilities and skills of an organisation will decide their competitive benefit (Barney et al., 2001).

Sources should meet the following features:

1 value, implying a critical significance for consumers and firms

2 rare resources ensure to be limited and extraordinary in the perception that are hard to find in the rivalry

3 imperfect imitability, those sources cannot be reproduced by organisations that do not have such resources

4 non-substitutivity, the substitution of resources with alternate sources is not feasible (Barney, 1986).

Drawing on RBV's theory, IC is the fundamental basis for its competitive advantage, corporate strategy improvement, and propensity to achieve higher-average profits.

2.3 General system theory

The general system theory (GST) portrays IS as a superordinate system consisting of social and technical subsystems, with knowledge playing a critical role as a mechanism for the transfer of units of information from the social to technical subsystems and vice versa (Kast and Rosenzweig, 1972). The social subsystem comprises the persons (e.g., structure, incentive structures) and their interconnections, including expertise, competencies, and values (Lee et al., 2015). The technical subsystem is described as the computers, instruments, and methods required to turn inputs into outputs to improve the firm's efficiency (Sykes et al., 2014). Both social and technical subsystems are malleable, with flexible and permeable limits, and arise under evolving circumstances and processes (Wynn and Williams, 2012). In other words, the subsystems are open systems that communicate with the system's environment and share with other subsystems (Pike et al., 2018). The GST provides users with full control and offers them a powerful way to observe human and technology activities and events (Porra et al., 2005).

The spectrum of application of GST can be captured that the systems approach is applied in many different ways including; hard, mechanistic, closed and predictable systems, such as physical systems and biological systems, to soft, organic, open and unpredictable systems, including cognitive systems like human interaction, human perception, and human brain simulation (Burton-Jones et al., 2015). It is therefore evident that GST could become a very powerful and much needed instrument for the development of the IS capability. Complex systems are made up of their parts that interact and together make up the larger system. These relationships continue into smaller and more complex systems. In the context of IS systems, the sociotechnical framework (which includes the social subsystem and the technological subsystem) is the proper subsystem to concentrate on (Sarker et al., 2019). The social system comprises of the users (including their information, expertise, and values), structures (e.g., hierarchy, incentive structures), and their interrelationships (Lee et al., 2015), so that structured trends emerge, along with mutual types, worth's, and signs (Allon and Hanany, 2012). In this sense, the technical subsystem is stated which involves, among other things, the devices, equipment's, and practices that are required to turn inputs into outputs, providing an enhanced performance for the organisation (Sykes et al., 2014). In order to amplify

business success, ISCs (i.e., linking systems, interfaces, information, technology, business sense) provide the fundamental basis to optimise business efficiency. Drawing on GST, IS capability are the fundamental basis to leverage financial performance.

2.4 Relationship between IC and financial performance

The firm's resources (RBV) point of view that the competitive advantage is achieved by necessary, rare, inimitable, and unsubstituted heterogeneous resources (Barney, 1991). The strategic and specific information structure integrated into organisational processes with assets is different from tangible resources such as property, packaging materials, or capital readily accessible from transactions that lead to significant changes in the company's operational environment (Tull and Dumay, 2007). The most critical factor for shareholders is financial performance. Based on shareholder value, this indicates the interest or attention of shareholders. Financial performance indicates whether the plan of the organisation leads to fundamental changes. The company's excellent financial results, i.e., growth strategies and profitability strategy, can be enhanced in two ways, according to Kaplan (2009). Improving efficiency can be accomplished by:

1 decreasing direct and indirect costs or making better use of financial and physical assets

2 decreasing capital expenditure and fixed capital required to maintain those market levels.

IC is identified as any key contributor to the firm's value-generating processes, is regulated by the firm and generated by the firm (Bontis, 1999). Among the contexts, there is a certain consensus on the three existence of IC contributions: human capital, relational capital, and innovation capital, the most frequent elements implemented in this research (Martín-de-Castro et al., 2011; Subramaniam and Youndt, 2005). Human capital supports and is important for creative success because the expertise, experience and expertise of workers in today's rapidly evolving world are key (Hsu and Wang, 2012; Han and Li, 2015). Recognition of IC and IS strategy is vital for organisational for organisational learning and IS success (Moeni et al., 2020). Human capital aims to improve the quality of information and learning and emphasises the role of individuals and communities in the sharing of knowledge (Hutahayan, 2020). The effort to acquire sufficient knowledge of intelligence and resources to incorporate and tackle the real challenges and awareness of the complex and on evolving business environment (Wahyuni et al., 2020). High-quality effects professionals with intense preparation and advanced expertise enable them to build up their intellectual capacity (Martín-de-Castro et al., 2011). They enhance their work efficiency by providing businesses with more decisive strategic judgment, working more efficiently, and eventually boosting its innovative results (Han and Li, 2015).

Relational capital is considered one of the main factors in recognising wealth creation by social structure (Subramaniam and Youndt, 2005). An organisation may receive valuable information or assistance from its clients, partners and customers. The relational capital of an organisation often directly affects the combination and sharing mechanism and makes it reasonably accessible network capacity (Nahapiet and Ghoshal, 1998). As evidence, business and government links' economic and operational output (Luo et al., 2012). Companies can boost innovative performance through close and embedded

customer ties, mainly some manufacturing companies with stronger strategic alliances will faster develop new products at a lower cost to influence innovative performance (Bonner and Walker, 2004). Empirical research shows that relational capital improves creative success for companies in Asia (Batjargal, 2003; Luo, 2003).

Innovation capital is a mechanism for the introduction of new products and/or services in an enterprise or the creation of new manufacturing and operating systems for satisfying consumer requirements (Jones, 2004). Innovation plays majorly in value creation, including new market growth, preservation of the current market shares, and improved competitive advantage. An essential part of the business strategy is creativity. The business has powerful weapons to conquer the innovative market. Creativity is also the subject of academia and market study. Major studies have tackled numerous market issues with attaining successful global competitive advantage (Hitt et al., 2001; Kuratko et al., 2005). Innovation aims not only to lower prices, but also to increase the quality of goods and services, to develop improved products, to expand the product experiences and to adapt to the preferences and requests of consumers. The performance company's growth also involves innovative products and services, new organisational structures, and new business plans. The impact of innovation upon firm success metrics has been shown by Terziovski (2002), which are varieties of strategies such as

1 integral innovation orientation

2 incremental innovation orientation

3 an extremist innovation orientation demonstrated the impact of innovation on firm achievement metrics (customer fulfilment, efficiency and technical effectiveness).

In sum, IC contributes to enhancing financial performance. Therefore, we posit the following hypothesis:

H1 The influence of IC on financial performance is significant.

2.5 Relationship between IS capability and financial performance

IS capability is important aspects of a company's ability to efficiently execute and use IT systems. IS strengths include fast sending and economic planning and strategically aligned cooperation (Gu and Jung, 2013). Likewise, IS capacity is characterised as a means of recognising and accessing knowledge acquired and easily implemented that is potential of IS organisations to develop awareness (Cepeda-Carrion et al., 2012). Therefore, rigorous IS capability will create value in a company by reacting swiftly to market change (Wang et al., 2015). The intersection of IS strategies and business strategies by access to reliable and easily accessible technologies can broaden the organisation's 'choice space' for doing business within markets (Teubner and Stockhinger, 2020). For example, information function capabilities required to run and maintain transactional systems ('systems of record') reliably and those for the agile development of small, modular applications in response to changing customer and market opportunities, thus will leverage income sales of products.

The capability of IS consists of numerous and complex aspects. There are various perspectives on the potential of IS in the current literature. Three viewpoints are suggested, for example, by Feeny and Willcocks (1998), a design of IT architecture, an enterprise vision, and an IS service offering. In the light of this IS capacity building,

thought, preparation, contractual facilitation, contract monitoring, informed purchasing and production of sellers that are giving accurate information to suppliers with changes in schedule, the manufacturer ensures the key supplier to respond faster to these changes, which can directly improve the production flexibility and leverage sales of product (Feeny and Willcocks, 1998). In addition, the following aspects are identified by organisational versatility, operational performance, preparing and outward and inward analysis which were the appropriate capability of IS (Mclaren et al., 2011). In addition, ISCs include three interrelated components: company and IS expertise, IT infrastructure versatility and process effective use. Tools and expertise are related to ISCs. Resources are stocks of available organisational factors, and thus substantive IS resources include the IT facilities that an individual owns and maintains. Skills are the cross-functional skill of the company to coordinate, use and activate these tools. IS competencies have six distinct features according to Peppard and Ward (2004), i.e., strategy creation, IT capacity description, IS contribution definitions, solutions provision, operations and execution. Garrison et al., (2015) argues the capability consisting of these areas that are defined by both resources and skills. Therefore, ISCs are based on IS of sources and skills and are the base of a competitive model which offers companies the expertise they need to achieve a better result (Wang et al. 2015).

In the field of IT innovation, for example, the term of synergy has been especially useful because concepts such as mutually supportive IT reliability (an example of an integrated approach) arise from the synergy of IT capabilities (each of which is a socio-technical subsystem) (Chatterjee et al., 2020; Chatterjee et al., 2021) while strategic IT alignment reflects capability helps improve firm performance in such environments (Sabherwal et al., 2019). The IS innovation framework, for example, serves as an innovative goal and driver, improving the permeability of knowledge across system boundaries, enabling the exchange and dissemination (using a technical subsystem) of knowledge (epitomised by the function of information) for the dynamic learning across social structures in an organisation (Boland et al., 2007). This research uses the GST principle of hierarchical subsystems to impact the organisation's output through the use of the power of IS. The second hypothesis is developed on the basis of previous arguments.

H2 The influence of ISCs on financial performance is significant.

2.6 Relationship between IC and effective strategic decision making

Each strategy calls for qualified human resources. IC is critical in the knowledge age since the success of the execution of the strategy determines strongly on the preparation of human capital. A plan for innovation involves skills aligned with strategic needs. In order to assess strategic success and achieve a sustainable competitive advantage, the position of IC is extremely significant. A business can turn its resources to reach its targets and aims by proper managing of human capital. The combination of intellectual assets and professional practices along with adaptation to internal and external dynamics change are important for the management of human resources. Flexibility is a crucial element in effective business plan execution. Aligning human capital management into the plan enables a clear interpretation of ways in which human capital attributes can be handled, assets underestimated or underestimated and costs and benefits of human capital management are assessed.

There has been an increased recognition of the need to incorporate a wider range of information on personnel in order to ensure an effective decision-making process (Nawaz, 2014). The competency of human resource function becomes more efficient and facilitate better information for decision making (Beadles et al., 2005; Ostermann et al., 2009). The skills of human resource are tacit and explicitly linked toward the process of company decision-making (Mata et al., 1995). Ranganathan and Sethi (2002) states ESDM that is a crucial activity for corporate leaders to have a positive or negative impact on organisational results. In specific high contexts have fewer restrictions and allow leaders to influence organisational results whereas low-discretion situations enable managers to form the results of their organisations (Finkelstein and Hambrick, 1998). For example, the degree of independence of the executives can have a major impact in the performance of an organisation for which it can either take strategic decisions or disregard them (Preston et al. 2008), as the executives are required to have the versatility to encourage strategic IT projects intended to improve value to the business (Broadbent and Kitzis, 2005; Smaltz et al., 2006).

To successfully deliver the plan, the management of the company demands human resources in line with the strategic requirements. In the business and IT divisions, all staff, from top to bottom, both attend to their individual duties but can also help to support strategic cohesion by contributing to the company's overall objectives (Oehlhorn et al., 2020). Adding a human resource management feature that links with the IT and company overall strategic objectives emerged as an important part of the implementation. Trustworthy institutional capital affects internal process performance, which ultimately will influence business performance. Human capital as an intangible asset has no direct effect on financial performance but enhances the performance of business processes (Kaplan, 2009). Innovation in strategic execution affects financial results by IC for innovation and in this case internal process performance. The organisational management needs an IC to execute the plan efficiently and to provide knowledge for the better decision-making process. Matching knowledge and the need for decision-making would enhance executives in making decision quality and justifying human resource investment decisions (Gerloff, 1991; Preston et al., 2008; Oehlhorn et al., 2020). The second hypothesis is developed on the basis of previous arguments.

H3 The influence of IC on effective strategic decision making is significant.

2.7 Relationship between ISCs and effective strategic decision making

IS capability plays a vital role in decision-making. Stakeholders face extremely unorganised activities and have a great amount of confusion to determine (Islei et al., 1991). However, some studies argue that IS skills have no major effect on ESDM. Structured ISs therefore have structured data, but decision-makers still require intangible and unstructured information in order to determine (Molloy, 1990). Compared to their peers, businesses do not take the requisite decisions in a timely manner without adequate ISCs. The time and effort needed to take decisions can be minimised using technical infrastructure and associated programs. Winkler and Wulf (2019) argue that IT service management capabilities such as customised application enhance the effectiveness of IS-generated decision-making by fostering goal and resource alignment between IS and business functions. For example, when the CEO asks data analysts about specific information (e.g., consumer purchases on the website) as data analysts are required to

provide details on the sales trend. However, many firms have access to advanced big data technologies that are synchronised with IS, which could improve knowledge to generate strategic decisions (Ghasemaghaei and Turel, 2020). In addition, value adds business processes are undeniable when knowledge is handled accordingly across the supply chain. These principles are gained as knowledge enables individuals and processes to take efficient actions and decisions. In this way, information management seeks to ensure that the resources required in the supply chains are optimally applied and realised. In maintaining projects, knowledge management is particularly critical by exchanging the relevant information which enables companies in the supply chain to take better decisions. These decisions may be optimistic, negative, inadequate or motivated, but they are ultimately guided by the knowledge given (Titus,Bröchner, 2005).

ISCs therefore improve the efficacy of executives in decision-making to accomplish their managerial objectives (Huber, 1990). A wide number of people may also be involved in the decision-making process. IT-based services have a direct effect on consumer conduct, particularly when it comes to remaining at or leaving the IT-based service. Factors that influence this decision-making include IT experience, availability of personal IT equipment, IT intervention activities, customer and user preferences, as well as the value of certain functions (Tsohou et al., 2020). IS skills often minimise an organisation's level of authority during decision-making and cause challenges and/or opportunities to be detected quicker and more accurately. Precise prediction of IS strategic orientation increases clarity and decision-making; managers may therefore focus on more important factors (Islei et al., 1991; Aydiner et al., 2019; Winkler and Wulf, 2019). Then we predict a positive link between the capability of the IS and effective strategic decision making, leading to the following hypothesis:

H4 The influence of ISCs on effective strategic decision making is significant.

2.8 Relationship between effective strategic decision making and financial performance

The output of decision-making influences executive decisions when determining practical solution to the problem for a business (James and Mark, 1996). The good decision-making outcome therefore leads firm results into the successful implementation of new products and services and allows to incorporate them into new technologies (Baum and Wally, 2003), contributing for improved company efficiency. The financial and non-financial versatility, consistency, awareness and expenses of corporate and organisational capacities (Bernhard et al., 2006). Efficient decision-making allows economies of scale and synergies of expertise through various organisational combinations and makes it easier to maximise opportunities both in a dynamic and non-dynamic environment. For example, management decision-making develops the capabilities which ultimately form the strategic choices of the organisation (Noda and Bower, 1996). Managers will also take separate measures that affect the strategic development of the business, allowing the strategy to evolve without the intervention of management (Mintzberg, 1994). In comparison, decentralised strategic decision-making practices can include managers through autonomy which enables them to take strategic actions and their involvement in the key strategic decisions of the company (Andersen, 2001). In the context of the leader of organisations that apply centralised IS capability that makes strategic decision-making to optimise the organisation's performance as a

whole (Liu, Huang, and Lucas, 2020). For example, CEOs have more improved strategic decision-making mechanisms and are more efficient in selecting judges because supporting system integration, knowledge sharing, and collaboration between different departments are more efficient and help with a concerted effort to improve financial performance.

In addition, Karahanna and Chen (2006) address that the strategic effectiveness of the CIO is significantly linked to the financial performance of the company. We imply who CIOs that are efficient strategic leaders are able to exert strategic decision-making power properly in order to take strategic measures which are more likely to improve IS' contribution to organisational efficiency and to track the progress of such initiatives. We therefore expect the following hypothesis to be found in a positive connection between decision-making and financial performance:

H5 The influence of effective strategic decision making on financial performance is significant.

2.9 The role of effective strategic decision making in mediating the impacts of IC and financial performance

The organisational management needs an IC to execute the plan efficiently and to provide knowledge for the better decision-making process. Matching knowledge and the need for decision-making would enhance decision quality and consequently business performance (Preston et al., 2008). Successful strategic decision-making practices may include managers through autonomy to take strategic-effect steps and involvement in the essential strategic decisions of the organisation (Andersen, 2001). Thus, the following hypothesis is set as follow:

H6 The effective strategic decision making mediates the relation between IC and financial performance.

2.10 The role of effective strategic decision making in mediating the impacts of ISCs and financial performance

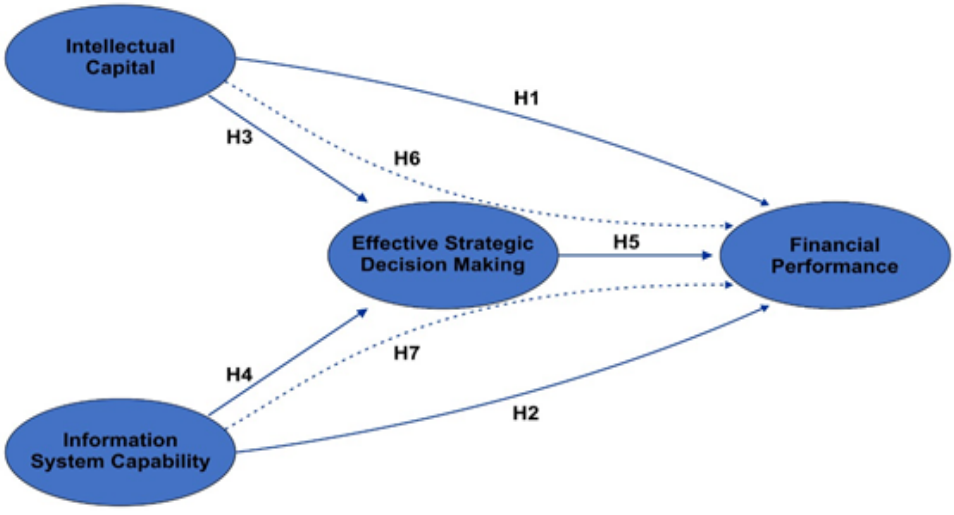
IS skills improve managerial effectiveness in decision-making, which decreases the level of corporate hierarchy through decision-making processes and facilitates the quicker and further precise detection of challenges and/or prospects (Huber 1990). In addition, strategic efficiency for decision-making is positively related to the financial performance of a company (Karahanna and Chen, 2006). Efficient strategic leaders are able to exercise strategic decision-making powers properly in order to take strategic measures that improve the IS's contribution to corporate efficiency and track the effective implementation of those initiatives. Thus, the following hypothesis is set as follow:

H7 The effective strategic decision making mediates the relation between ISCs and financial performance.

2.11 Conceptual design

Based on the findings, both of the IS capability and IC leverage financial performance with the role of mediator in ESDM. The conceptual model introduced is illustrated in Figure 1.

Figure 1 Conceptual model of study (→ :direct effect; →: indirect effect) (see online version for colours)



3 Methodology

3.1 Data collection and sample

The data used in this analysis have been gathered from a database of the Indonesian Ministry of State Enterprise. We have randomly chosen 113 firms as the study respondents. The research unit was at the company level. The key informants in this research study were the top managers, the chief executive officer (CEO), and the chief information officer (CIO), who made up the top management because they were actively involved in strategic alignment. The executive roles that are usually held by the CEO and top management are long established. And often a top-level member who holds executive positions is added to a CIO role to reflect a reform to the organisational structure (Karahanna and Preston, 2013). Besides aligning the organisation's objectives and strategies with the goals of the organisation's parent corporation, a top-level manager is also active in revising value development and aligning the business of the organisation as well as the IS strategy (Chan, 2002).

The self-addressed and stamped envelopes have also been supplied with a cover letter describing the importance of the study in promoting the return of full questionnaires. Requests for follow-ups and letters of reminders were used to explain challenging questions and increase the response rate. These efforts culminated in the receipt of 106

valid questionnaires with a response rate of 93.8% an appropriate standard for survey-based management study (Handley and Benton, 2009).

Table 1 Stated-owned company profiles

Characteristics		*Number*	*%*
Respondent's position	CEO/Director	33	31.10%
	Vice President	43	40.56%
	General Manager	30	28.30%
Number of employees	Less than 100	41	38.67%
	Equal or more than 100	65	61.33%
Business sectors	Insurance and other services	9	8.6%
	Energy, oil and gas	2	1.2%
	Mineral and coal	2	1.2%
	Food and fertiliser	10	9.9%
	Defence and manufacturing industry	11	11.1%
	Cement industry, surveying and other industries	17	14.8%
	Telecommunications and pharmaceutical industries	3	2.5%
	Construction and housing services	17	16.0%
	Regions and logistics tourism	10	11.1%
	Banking and financing	8	7.4%
	Plantation and forestry	3	2.5%
	Transportation facilities and infrastructure	14	13.6%

3.2 Instrument development

The researchers defined three variables on the basis of the literature review (IC, ISCs, effective strategic decision making) contributing to financial performance. As example, respondents were asked to state the importance of IC and ISCs to enhance their financial performance, applying a five-point scale, 'strongly disagree' (1) and 'strongly agree' (5). This analysis categorises IC into human capital, innovation capital and relational capital. Human capital was measured by four items which employees' company have capability to adapt dynamic situation, good integrity, good loyalty, and synergy to create added-value (Yitmen, 2011). Relational capital was measured by four items which company have to build good reputation, to maintain good relationship with business partners, commitment to maintain satisfying customers, and good relationship with shareholders (Yitmen, 2011; Costa et al., 2014). Innovation capital was measured by four items which company have to enhance innovation in design product, to monitor innovative strategy periodically, IS to be easily for innovative strategy, and good standard operating procedure to support innovation (Yitmen, 2011; Wang et al., 2014).

ISCs was measured by 12 items which company have good capacity for IS infrastructure, a high response demand from external client, flexible operating on internet system, a provided data real-time for employee, integrated to involve a different functional unit, capable IT staff to implement new technology, capable IT staff to give fast solution, capable IT staff to synchronise between IS strategy and corporate strategy,

to increase effective decision-making, to help effective firm performance, to help purchasing making fast decision, and easily to create the planning of corporate strategy (Aydiner et al., 2019).

Effective strategic decision making was measured by two items which company makes strategic decision with fast, and high quality (Baum and Wally, 2003; Cragg et al., 2002). Financial performance was measured by three items which company have growth sales, return on asset (ROA) in last three years, and growth net income (McMillan, 1988).

4 Data analysis and results

In order to understand the direct and indirect impact of IC and ISC on financial performance with the mediating influence of effective strategic decision making at stated-owned companies in Indonesia, for the evaluation of the overall measurement model, a statistical SmartPLS software package partial least square-structural equation modelling (PLS-SEM) was used.

4.1 Measurement model

Convergent validity and discriminant validity have been tested. Convergent validity is the extent to which the objects to measure a single building agree. We have evaluated convergent validity by testing substantial factor loads exceeding 0.7, composite reliabilities exceeding 0.8 and the average extracted variance (AVE) that should be more than 0.5 for all constructs (Fornell and Larcker, 1981). The majority of factor charges in our model are greater than 0.7 and measuring objects are removed if their factor loads are less than 0.70. The results show that our model meets the criterion of convergent validity. With Cronbach α, we tested the internal reliability of scales. Table 2 indicates the loading factor, AVE, CR and (C–α) of all constructions.

Table 2 Convergent validity

Constructs	*Items*	*Factor loadings*	*Cronbach α*	*Composite reliability*	*AVE*
Intellectual capital (IC)	IC1	0.872	0.948	0.956	0.707
	IC2	0.766			
	IC3	0.844			
	IC4	0.793			
	IC5	0.874			
	IC6	0.791			
	IC7	0.832			
	IC8	0.687*			
	IC9	0.691*			
	IC10	0.885			
	IC11	0.675*			
	IC12	0.898			

Table 2 Convergent validity (continued)

Constructs	*Items*	*Factor loadings*	*Cronbach α*	*Composite reliability*	*AVE*
Information system capabilities (ISC)	ISC1	0.878	0.942	0.952	0.741
	ISC2	0.812			
	ISC3	0.799			
	ISC4	0.879			
	ISC5	0.895			
	ISC6	0.688*			
	ISC7	0.905			
	ISC8	0.614*			
	ISC9	0.598*			
	ISC10	0.648*			
	ISC11	0.635*			
	ISC12	0.852			
Effective strategic decision making (ESDM)	ESDM1	0.922	0.835	0.924	0.858
	ESDM2		0.931		
Financial performance (FP)	FP1	0.853	0.862	0.916	0.785
	FP2	0.892			
	FP3	0.911			

Note: * Dropped from the final construct due to the low factor loadings (below 0.70).

This new suggested approach was also used to check the discriminant validity in the form of Heterotrait-Monotrait ratio of correlations and the results are shown in Table 3. If the HTMT surpassed the value of 0.90 (Gold et al., 2001), then there is problem of discriminant validity. As all the values are less than the HTMT (Gold et al., 2001) shown in Table 3 that discriminant validity has been identified. All constructions in the measurement model also were determined to be sufficiently discriminatory. The estimation model takes into account the relationship between the variables and their items. The measuring of goodness-of-fit model were shown to be acceptable (standardised root mean square residual [SRMR] = 0.06, and normal fit index [NFI] = 0.914) and confirmed the proposed model because of SRMR value < 0.08 and NFI value > 0.9 (Henseler et al., 2014). Finally, we posit how the framework fits well with the data and is therefore sufficient to test the hypothesis for the study.

Table 3 Discriminant validity

	ESDM	*FP*	*IC*	*ISC*
ESDM				
FP	0.861			
IC	0.859	0.878		
ISC	0.853	0.864	0.885	

4.2 Hypothesis examining

The research assesses the structural relationships between the variables by analysing the various mediatory impacts through a path analysis. Path analyses were employed to evaluate hypotheses in the research model using the Smart-PLS program. The research shown in Table 4 portrays standardised path coefficients of the study model. Table 4 and Figure 2 describe that the path coefficients from IC to Financial Performance was also positive and significant ($\beta = 0.421$; p value < 0.01), whereas the path coefficients from information system capability (ISC) to financial performance was also positive but non-significant ($\beta = 0.144$; $p < 0.01$). Therefore, H1 is supported but H2 is not supported. The path coefficient from IC to effective strategic decision making was positive and significant ($\beta = 0.400$; $p < 0.01$), and the path coefficient from ISC to effective strategic decision making was positive and significant ($\beta = 0.425$; $p < 0.01$). Thus, there is enough evidence to support H3 and H4. Finally, the path coefficient from effective strategic decision making to financial performance was positive and significant ($\beta = 0.382$; $p < 0.01$) that the result supports H5.

Additionally, the indirect relationship of IC on financial performance through effective strategic decision making as mediator was also positive and significant ($\beta = 0.153$; $p < 0.01$), that H6 is supported. Then, the indirect effects of ISC on financial performance through effective strategic decision making as mediator was also positive and significant ($\beta = 0.162$; $p < 0.05$), that state H7 is supported. Given the above, we can conclude that effective strategic decision making fully mediates the link between ISC and financial performance. Whereas effective strategic decision making has partial mediation for link between IC and financial performance.

Table 4 Hypotheses testing

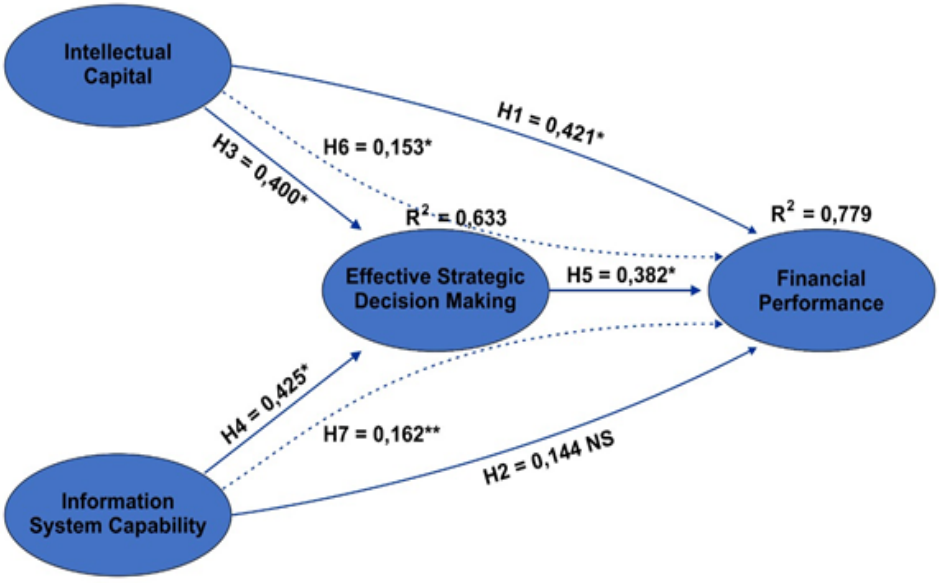
Hypothesis	*Relationship*	*Standard coefficients*	*Test result*
H_1	Intellectual capital→financial performance	0.421*	Significant
H_2	Information system capabilities→financial performance	0.144	Non-significant
H_3	Intellectual capital→effective strategic decision making	0.400*	Significant
H_4	Information system capabilities→effective strategic decision making	0.425*	Significant
H_5	Effective strategic decision making→financial performance	0.382*	Significant
H_6	Intellectual capital→effective strategic decision making→financial performance	0.153*	Significant
H_7	Information system capabilities→effective strategic decision making→financial performance	0.162**	Significant

Note: Significant at *1% and **5% levels.

Figure 2 displays the R^2 (the portion of the variance in the dependent variable that is predictable from the independent variable ranges from 0 to 1 the higher the better). R^2 value which are presented in Figure 2 show that the IC and ISC accounts for 63.3% of the

ESDM variance; the IC, ISC and ESDM accounts for 77.9% of variance in financial performance.

Figure 2 Results of path analysis (see online version for colours)



Note: *p value < 0,01; ns: not significant; ----: indirect effect.

5 Discussion

The results of the present study conclude that the IC significantly influence the financial performance of the stated-owned companies in Indonesia which confirm the findings of Bontis (1999), Hsu and Wang (2012) and Han and Li (2015). The aspect of IC lies in the wisdom of workers, which is part of human capital. The human capital of Indonesian companies was able to create value for the companies. The employees of stated-owned companies in Indonesia were able to do their utmost to get companies the best from their employees through their ingenuity and intellect. The workers were able to make the companies distinct from other companies with all their efforts. The majority of businesses in Indonesia have high quality recruitment workers with ideal competencies. It means that workers can collaborate with teams, have ideas and prepare for the achievement of the goal. The support of relational capital thus improves the exchange of information by promoting contact between members. It is because the employees of firms believe that communications network structures and arrangements have an important effect on knowledge sharing among employees and can help to improve the knowledge sharing between them in order to achieve their business goal.

Otherwise, the potential of the IS may not have had a financial effect on the output of declared companies. It is consistent with research findings for Aydiner et al. (2019) and Hutahayan (2020) that lack the IS infrastructure. Tangible and intangible ISCs were not both present in order to execute a cohesive plan to prevent ISCs from creating business

value and preserving the competitiveness of an enterprise in a marketplace. In accordance to the facilities of hardware/software for knowledge diffusion in the company, the employee's ability to introduce and manage technical ways out is lacking, and business goals are designed, coordinated and integrated into business processes that fail to achieve effective IS. Therefore, some companies that leave administrative capacity can struggle to achieve the anticipated performance gains, because IS managers have difficult bureaucracy for a management authority.

In addition, IC has a substantial influence on successful strategic decision-making, consistent with Preston et al.'s results in 2008 and Mata et al. in 1995. It is because executives are more likely to have strategic IT decision-making powers in organisations whose senior management team embraces IT. Previous research indicated which managers who inform directly to the CEO should be more able to line up with IT and provide strategic IT implementations to the company (Kearns and Lederer, 2003). The institutional role enables IT contribution by improving the latitude of the executives to pursue strategic IT initiatives. Managers will also be given strategic decision-making authority with a proven success record. This finding supports the literature which claims that human capital is a vital factor of strategic decision-making (Finkelstein and Hambrick, 1996). CEO experience even less knows the essence of the experiences required how IT human resources policies can be built to certify that a new generation of CEOs are set to take up the role (Broadbent and Kitzis, 2006).

Thus, the IS capability significantly influence on the effective strategic decision making which is consistent the findings of Aydiner et al., 2019; Islei et al., 1991. Continued investment in developing capabilities contributes to the need of technology and IS solutions by businesses. These additional expenditures should be clear and observable in terms of their contribution to the success of the business (Peppard and Ward, 2004). Investing in IS skills should then help effective decision-making to boost their efficiency with intangible assets as both create the organisational foundation to strengthen a company's power. The combined capabilities and competences of the IS capacity play a central role in strategic organisational decision-making.

Therefore, the effective strategic decision making significantly influence on financial performance which is consistent the findings of Aydiner et al., 2019 and Karahanna and Chen, 2006. This will allow an organisation to identify issues more rapidly, predict prospects for economies of scale, seek alternative use of resources, efficient, achieve higher job efficiency, and identify new distribution channels and markets. Improved effective decision-making conducts to more efficient market processes that concentrate on quicker customer response. All these attempts have an effect on revenue returns, asset values and net profits, all of which help boost financial results. In this study, we conclude that the importance of IT comes from the management's decision-making latitude. Our study shows that high-level management can be in the presence of strategic decision-making authorities and can lead to financial success in the decisions on strategic decision-making policies.

The results further indicate that ESDM is a mediator between IC and IS capability and financial achievement. It is because executives in companies, whose senior management team includes IT, are more likely to have strategic IT decision-making authority. Investments in IS capacities should also help efficient decision-making to boost their efficiency with intangible assets, as they build the organisational foundation to reinforce a company's power. Enhanced efficient decision-making then indicates to more successful business processes based on immediate customer responses.

6 Implication

Theoretically, this study supports the synergy between theory of RBV and bounded rationality for relationship IC to increase financial performance of stated-owned companies through effective strategic decision making, although building IS capability is not able to build a sustained competitive advantage for a company. The effective strategic decision making is arranged as a mediator, this represents the new model creating that solves the research gap of the relationship between IC and IS capability on financial performance. This study provides finding that effective strategic decision-making improve the consistency, pace and efficiency of strategic and organisational decision-making. This will allow an organisation to detect issues more rapidly, predict opportunities for economies of scale, find alternative use of resources, reduce costs, achieve higher job efficiency, and identify new sales channels and markets.

From a practical point of view, the findings have major repercussions for managers. First of all, financial output requires more competent IC to prove that businesses should put high focus on IC discovery and exploitation. In particular, businesses should systematically train workers and enrich their work experience in order to improve human capital, create close relationships with their partners and strengthen partnership capital, and develop efficient processes and systems of knowledge to improve systemic capital. Second, successful strategic decision-making is critical, as it not only serves as a manager, but also a bridge between IC and financial output capacity of the IS. Since investment in IS ability should help successful strategic decisions to boost their output with intangible assets as both create the corporate backbone to reinforce a company's power. An organisation with timely and reliable data increases the ability to assess and evaluate market opportunities and to be agile in strategic decision-making for fact-based business action.

7 Conclusions and limitations

The findings of this study have delivered some significantly useful evidences of the role of IC to improve financial performance in the stated-owned companies in Indonesia whereas IS capability has no a substantial impact on financial performance. Then, the study suggests that effective strategic decision making mediate the link between IC and IS capability and financial performance. However, mediating by effective strategic decision making has a greater role impact from IS capability to financial performance rather than from IC to financial performance.

There are limitations in this analysis that suggest some future research directions. This analysis uses a cross-sectional design, which will allow a longitudinal study to be used for next research to further examine the effects of IC and the IS capacity on successful strategic decision making that also leverages financial efficiency. Finally, this research is only carried out by declared stated-owned companies, and it is quite advantageous to gather data from other private companies in order to provide more confirmation of results.

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Appendix

Table A1 Instrument constructs and indicators

Indicator	*Code*	*Reference*
Constructs: information system capabilities		
(Information system infrastructure capabilities)		
The capacity of our company information system network infrastructure is fully capable of meeting the needs of our company.	ISC1	Arafat et al. (2019)
Our company information systems infrastructure is capable of responding quickly to requests from external customers	ISC2	Arafat et al. (2019)
Constructs: information system capabilities		
(Information system infrastructure capabilities)		
Our corporate information systems infrastructure provides flexible operation for internet-based systems	ISC3	Arafat et al. (2019)
Our company information system data is available to everyone in the company in real time	ISC4	Tallon (2007)
Our company information system application is integrated covering different functional areas.	ISC5	Yi Wang et al. (2013)
Information system human resources capability		
Our company's IT staff has the ability to rapidly implement new technologies.	ISC6	Arafat et al. (2019)
Our company's IT staff can quickly provide technical solutions to business problems.	ISC7	Tallon (2007)
Our corporate IT staff is able to align information systems strategy with company strategy.	ISC8	Ravarini (2010)

Table A1 Instrument constructs and indicators (continued)

Indicator	*Code*	*Reference*
Information system administration capability		
Our company information system improves the accuracy of managerial decision making	ISC9	Arafat et al. (2017)
Our company information system is able to help increase the effectiveness of our work.	ISC10	Arafat et al. (2017)
Information systems about our company's products help expedite buyers to make decisions.	ISC11	Arafat et al. (2017)
The information system in our company makes it easy to make corporate strategic planning.	ISC12	Arafat et al. (2017)
Constructs: intellectual capital		
Human capital		
Employees in our company have the ability to adapt changes for innovation in a fast manner	IC1	Yitmen (2011)
Employees in our company have good integrity in supporting company policies.	IC2	Shoichiro (2014)
Employees in our company have good loyalty in realising the company's vision and mission.	IC3	Yitmen (2011)
Employees in our company are able to work together to create economic value in our company.	IC4	Yitmen (2011)
Relational capital		
Our company continues to build a reputation by improving service and product quality.	IC5	Yitmen (2011)
Our company maintains good relationships with business partners.	IC6	Shoichiro (2014)
Our commitment as company leaders is a priority in maintaining customer satisfaction.	IC7	Yitmen (2011)
Our company maintains a good relationship with shareholders intensively.	IC8	Costa et al. (2014)
Constructs: information system capabilities		
Innovation capital		
Our company encourages increased innovation in the design of our products	IC9	I.Yitmen (2011)
Our company always monitors development strategies for innovation on a regular basis.	IC10	Yitmen (2011)
Our company has an easily accessible information system for innovation purposes.	IC11	Wang et al. (2014)
Our management systems and procedures are good enough to support innovation.	IC12	Wang et al. (2014)
Constructs: effectivity strategic decision-making		
Our company makes strategic decisions quickly.	ESDM1	Baum and Wally (2003)
Our company makes strategic decisions with the right achievement (quality)	ESDM2	Paul Cragg et al. (2002)

Table A1 Instrument constructs and indicators (continued)

Indicator	*Code*	*Reference*
Constructs: finance firm performance		
Our company is able to increase the percentage of high sales growth in a year.	FP1	Low and MacMillan (1988)
Our company has been able to achieve an increase in return on assets in the last 3 years	FP2	Low and MacMillan (1988)
Our company is able to achieve an increase in net profit in a year.	FP3	Low and MacMillan (1988)