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Article

Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency

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Suggested Citation: Makhloufi, Lahcene; Yaacob, Noorulsadiqin Azbiya; Laghouag, Abderrazak Ahmed; Sahli, Alhussain Ali; Belaid, Fateh (2021) : Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 8, Iss. 1, pp. 1-23, https://doi.org/10.1080/23311975.2021.1935665

This Version is available at:
https://hdl.handle.net/10419/245051

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Cogent Business & Management

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/oabm20

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To cite this article: Lahcene Makhloufi, Noorulsadiqin Azbiya Yaacob, Abderrazak Ahmed Laghouag, Alhussain Ali Sahli & Fateh Belaid | (2021) Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency, Cogent Business & Management, 8:1, 1935665, DOI: 10.1080/23311975.2021.1935665

To link to this article: https://doi.org/10.1080/23311975.2021.1935665

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Published online: 15 Jun 2021.

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Makhloufi et al., *Cogent Business & Management* (2021), 8: 1935665
https://doi.org/10.1080/23311975.2021.1935665

cogent business & management

Received: 14 March 2021
Accepted: 23 May 2021

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Reviewing editor:
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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency

Lahcene Makhloufi[1]*, Noorulsadiqin Azbiya Yaacob[1], Abderrazak Ahmed Laghouag[2], Alhussain Ali Sahli[2] and Fateh Belaid[3]

Abstract: The purpose of this research is (1) to examine the integration impact of IT assets (e.g., intangible IT resources, IT capability, and IT flexibility) on core competency, and (2) to explore the mediating effect of core competency on the relationship between IT assets and sustainable competitive advantage (SCA), and (3) to determine whether IT flexibility strengthen the relationship between core competency and SCA. The study applied a quantitative and cross-sectional approach to collect data from 164 Malaysian small and medium-sized enterprises (SMEs) targeting managers from the middle-to-upper level. The findings infer new insights regarding IT integration's critical role within core competency activities to achieve SCA. The results show that IT assets possess a positive and significant impact on core competency (CC), and CC positively impact SCA. Finally, CC partially mediates

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PUBLIC INTEREST STATEMENT RESEARCH HIGHLIGHTS

Shows that IT assets have a positive direct significant influence on core competency and sustainable competitive advantages.
Demonstrates that core competency is partially and positively mediates the relationships between intangible IT resources, IT capability, and IT flexibility on competitive advantages.
Shows that IT flexibility moderates and significantly improve the competitive advantages of Malaysian SMEs in the wood-based industry.
Incorporates IT assets (e.g., intangible IT resources, IT capability, and IT flexibility), core competency, and competitive advantages in a single study.Demonstrates the importance of developing technological competencies to shift from low-tech industry to high-tech to improve competitiveness and productivity of Malaysian wood-based industry.Determining the importance of core competency integration into a firm's dynamic capabilities generates strategic core assets of sustainable competitive advantages.We emphasize the critical role of technological competencies to shift the furniture industry from traditional form to digitized ones (innovative furniture).

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the relationship between IT resources and IT capability to SCA, and IT flexibility positively moderates the relationship between CC and SCA. This study addressed IT's integration within core competency activities to help SMEs achieve SCA. The study advances dynamic capability theory by providing new insights into the importance of core competency and IT integration to develop and reconfigure existing capabilities to fit business strategy goals.

Subjects: Management of Technology & Innovation; Innovation Management; Entrepreneurship and Small Business Management; Small Business Management; Asian Business

Keywords: Sustainable competitive advantage; Core competency; IT flexibility; IT capability; Intangible IT resources; Dynamic capability theory; Malaysian SMEs

1. Introduction to the problem

The core competency concept was developed by leading experts Hamel and Prahalad (1990) in strategic management. With advanced uncertainty and high failure of business sustainability, core competency (referring to the capability of firms' productive resources, including skills and technologies, and tacit and explicit knowledge assisting the firm in formulating collective learning and know-how, which yields distinctive capabilities via organizational processes, ensuring superior coordination of firms functional core activities) is vital for strategic resources creation (Hamel & Prahalad, 1990; Prahalad & Hamel, 1997). An organization's capability to advance the business in a volatile environment marked by competition, increased customer needs and pressure, product life cycle period, and regulations require core competency, which enables the firm to identify a framework wherein the core strengths can be determined and thus strategize accordingly (Assensoh-Kodua, 2019; Ravichandran et al., 2005). Therefore, core competency is a skill that empowers an organization to deliver unique benefits and services for its customers by enabling the corporation to formulate, improve, upgrade, and deploy those unique resources that play a crucial role in creating sustainable competitive advantage (SCA) (Chen et al., 2017; Hsiao & Hsu, 2018).

Information technology (IT) is recognized as a critical factor that enables a firm's core competency by improving operational efficiencies, minimizing cost, and automation (Ashrafi & Mueller, 2015; Chen et al., 2017). The IT infrastructure flexibility and IT strategic planning empower advanced computing capabilities, effective information processing, business analytics effectiveness, tracking customers' needs and anticipated preferences, competitors' actions and reactions, and regulations and law of new markets (Al-Surmi et al., 2020). Beyond significantly contributing to the operational and tactical impacts, IT strategic planning capability is a key driver for enabling an organization to transform strategies, relationships partners, linking customers' needs with business design, and developing competitive business models (Bharadwaj et al., 2013; Ilmudeen & Bao, 2020).

IT capability plays a strategic role in creating new products to fit customer needs, while IT knowledge resources support an organization to collect, disseminate, and analyze the data (information) about customers, markets, competitors, and processes to effectively increase responsiveness toward any changes within the business environment (Ashrafi & Mueller, 2015). Past IT studies introduced IT capability as several dimensions (e.g., IT operation, IT knowledge, IT competencies, IT management, and IT alignment) concerning business performance and competitive advantage (Ilmudeen et al., 2019). It was reported that IT improves an organization by exploring and exploiting opportunities, which leads to reconfiguring existing IT resources to avoid rigidity (Tian et al., 2010). For example, an empirical investigation by Asherafi (2015) found that IT capability and IT knowledge have a significant impact on firms' financial performance. At the same time, Chen et al. (2014) found that IT capability can enhance business performance through IT

flexibility. Besides, empirical evidence by Lu and (Ram) Ramamurthy (2011) stated that IT capability influences firms' marketing flexibility and operational processes, while Tallon and Pinsonneault (2011) established the relationship between customer, operational flexibility, and firm performance.

This research extended the body of knowledge by standing on three primary empirical studies (Ravichandran and Lertwongsatien, 2005; Chen et al., 2017; Rivard et al., 2006) which published in top academic journals but failed to provide evidence concerning the strategic effect of missing link between firm's resources, capabilities, and their competencies on SCA. The empirical study by Ravichandran and Lertwongsatien (2005) stated that emphasizing IT capability and its outcomes (e.g., firm performance and SCA) leads to poor comprehensiveness on the issue conditions of SCA achievement, especially in dynamic environments. However, giving more attention to core competency enabled by IT flexibility and IT strategic planning helps managers exploit the strategic process of core competency impact on SCA. Ravichandran and Lertwongsatien (2005) found a positive relationship between IT support for core competency and its performance. Another study by Rivard et al. (2006) revealed that IT support core competency has a significant impact on firms' profitability. In contrast, Chen et al. (2017) found that IT support for core competency significantly impacts firms' strategic flexibility.

Unquestionably, these three studies used IT support for core competency as a single construct to measure strategic flexibility and firm performance, where they combined the two concepts to reflect one single complicated factor. This leads to ambiguity among researchers and confusion among managers since core competency differs from one organization to another. In addition, these studies were unable to determine what kind of IT assets and core competencies interacted together and did not identify which factor contributed most to strengthen core competencies. For these reasons, these studies increased ambiguity rather than clarity in understanding precisely how IT improves core competency (e.g., technological, marketing, and functionality competencies). Therefore, this effort was made to identify and distinguish these factors to explore the most influential IT resources that flexibly integrates with core competency to enhance competitiveness.

Another reason for conducting this study was to provide empirical insight into direct relationships of particular IT factors on core competency independently, enabling firms to deploy specific strategic activities via coordination and interaction of IT with business strategy. Rather than addressing the direct effect of IT on SCA, this research examined the binding impact of IT (e.g., IT capability, Intangible IT resources, and IT flexibility) on core competency and the extent to which these factors enable core competency to attain SCA. This critical contribution can help researchers understand new ways for different IT dimensions to enhance SCA and help managers clarify the ambiguity of the relationship between IT and core competency to better create distinctive capability in maintaining SCA. Therefore, this study closes this critical missing link between IT, core competency, and SCA. Based on the above discussion, this paper assumed that the extent of IT capability and IT resources that influences core competency would depend on the importance of IT flexibility in enabling close interaction between IT department and core activities, such as market-driven competency (e.g., tracking customer, competitors, and market information) and related technological competencies (e.g., improving responsiveness to develop a new product based on customer needs).

Similarly, this study also addressed the direct and indirect effects of IT flexibility on core competency and SCA. IT flexibility consisting of technical skills of IT personnel in technical matters, networks, hardware, and software, are critical factors that enable the organization to develop present and future applications and accelerate the firm's effectiveness and responsiveness with business changes. Also, a systematic review of past IT studies (Ashrafi & Mueller, 2015) argued that IT infrastructure is recognized as an enabler that influences a firm's flexibility (Kohli & Grover, 2008; Lim & Trimi, 2014). In this research, it was assumed that considerable investment in IT might not improve core activities when IT flexibility does not interact with appropriate core strengths,

leading to a negative influence on overall business strategy and related goals (Tian et al., 2010). An organization must determine its core strengths and focus on it to leverage IT capability and flexibility to respond to customer needs, competitor's actions/reactions, market regulations, and other factors that might be able to affect the critical determining core strengths (Behnam & Cagliano, 2019; Hsiao & Hsu, 2018).

In summary, the primary motivation for conducting this research was to fill gaps by (1) disclosing the missing link between IT resources and capabilities on core competency and SCA by examining IT flexibility's strategic effect on core competency. (2) The majority of past IT studies focused on IT capability and its relations to firm performance or SCA while overlooking other aspects. (3) Investigate and delineate the link between IT capability, IT resources, and IT flexibility and core competency on SCA. (4) Determining what kind of core competency yields added value and the need to exploit these core strengths.

In addition, based on the resource-based view (RBV), IT flexibility is the leading strategic enabler for empowering organizations to achieve SCA. So far, how IT flexibility impacts firms to create SCA via core competency is yet to be explored. Moreover, these distinctive competencies are dependent on functional capacities within the corporation IT department and thereby impacted by the knowledge, technological, and relationship resources acquired by the IT department. In the following sections, the relationship between constructs and hypotheses is discussed. The paper, therefore, consists of five sections starting with an introduction and secondly discussing theoretical framework and hypotheses development. The third section emphasizes the methodology applied (e.g., sampling technique, data collection, and measurement variables). At the same time, the fourth section was representing the data analysis and findings. The last section discussed the conclusions obtained, interpreted the results, validated the hypotheses, and elaborated on theoretical contribution and practical implication for academicians, policymakers, and stakeholders.

2. Theoretical framework and hypotheses development

2.1. Intangible IT resource (IITR), IT capability (ITC), and core competency (CC)

Core competency (CC) is the critical driver of superior business performance (Hsiao & Hsu, 2018). Hamel and Prahalad (1993) viewed CC as a triangle of competencies where each competency complement and integrated with other competencies, namely: technological, marketing, and integrative competencies (Prahalad & Hamel, 1997). Technical competencies refer to firms' ability to combine and integrate several applications to develop and design unique products, upgrade processes that lead to new knowledge and routines (Smith, 2008; Zoia et al., 2018). These close interactions of tangible and intangible assets will enhance firm competitiveness, fulfilling customer needs, and attracting new ones, along with expanding market shares (Cetindamar et al., 2009). In comparison, market competencies refer to the corporation's capacity to apply the obtained knowledge (information) and skills to match the market's demands, and customer needs by adding value to their products and services (Acikdilli et al., 2020; Golfetto & Gibbert, 2006).

Hence, these competencies reflect the holistic understanding and responding to customer preferences, forecasting market demands and competitors' alternative products through mobilizing marketing research, attracting customers' behavior, reaction to competitors' actions, determining valuable channels (Mitręga, 2019; N. Wang et al., 2012). By applying the collective information and mobilizing several marketing capabilities about customers, markets, and competitors, firms can formulate and deploy valuable and unique strategies that enable them to successfully compete and survive in a high fluctuated environment (Song et al., 2008). Lastly, an empirical study by Y. Wang et al. (2004) explored that integrative competencies are the key driver of core competency and firm performance. Integrative competency is the primary driver and consequence of close interaction of technological and marketing competencies to develop and

leverage processes, improving strategic business alignment, leading to superior performance (Lokshin et al., 2009; Ritter & Gemünden, 2004).

Past studies such as Ashrafi (2015) empirically tested and found that IT knowledge resources positively associate with business performance and advantages. IT knowledge resources help firms access knowledge access by tracking the triangle of business survivals: customers, markets, and competitors, to effectively respond and mobilize valuable strategic resources that match these three central fluctuated pillars of business survivals (Ashrafi, 2015). IT relationship resources refer to firms' interaction with external IT consultants to track and forecast future business opportunities, customer behavior development, alternative products, and processes, leading to enhanced firms' responsiveness and flexibility to the business changes (Guillemette & Paré, 2012). On the other hand, technological competencies that refer to the application of know-how, routines, technical and managerial skills to develop new products and processes succeeded in the light of knowledge-based corporation (Martín-Rojas et al., 2013). Therefore, technological competencies are achieved and attain SCA when it integrates with IT knowledge resources (Agarwal & Brem, 2015), which leads to creating business opportunities and acquiring prediction capabilities to estimate business changes (Chen et al., 2017).

Meanwhile, IT knowledge resources help firms marketing competencies to predict customer behavior changes, predict market demands, and improving proactive strategies to encounter competitors' actions and the fundamental business changes. Furthermore, IT consultants provide several solutions to foster marketing competencies to gain SCA through research and development concerning the changes in markets, product development and functional sides, customer preferences, rivals' choices, laws, and regulations. Therefore, this study assumed that intangible IT resources work as a major determinant of marketing and technological competencies to predict and attain SCA. Thus, we hypothesize:

H1a: Intangible IT resources positively influence core competency.

H1b: Core competency mediates the relationship between IITR and SCA.

A systematic review of prior empirical studies Ashrafi (2015) suggested that IT strategic capability fosters business performance by aligning business strategies with IT-business application, resulting in high flexibility to face business uncertainty (Tallon, 2011). IT strategic planning is the process of mobilizing and achieving a close interaction between technological capabilities, routines, IT systems, and IT-enabled business models to match business goals and objectives (Luftman & Ben-Zvi, 2011). These interactions would enable firms to upgrade products, design, develop new ones, update processes, and proactively encounter alternative products. Hence, since IT capability emphasizes the core focus of technological competencies, it can be assumed that IT capability would impact core competency and SCA (N. Wang et al., 2012).

Business knowledge and technical skills of IT personnel capability play a major part in aligning, developing, upgrading. Integration of several IT business applications into business processes and product design (Ashrafi, 2015) to foster core market and technological competencies (N. Wang et al., 2012) to absorb business uncertainty and ensure business survival (Bulchand-Gidumal & Melián-González, 2011). IT personnel capability viewed as a strategic resource for deploying these unique capabilities within critical core business activities yielded dissimilar and unduplicated capabilities by rivals, unable to understand the creation process (Rivard et al., 2006) thus becoming the foremost way for SCA. Also, leveraging IT-business applications within the core competency area is the primary source of increasing absorptive capacities to encounter external business pressures. Thus, exploring and examining the effect of IT capability on core competency is of

utmost theoretical importance and practically beneficial for IT managers in the wood-based industry.

The three studies mentioned previously (Ravichandran and Lertwongsatien, 2005; Chen et al., 2017; Rivard et al., 2006) used IT support for core competency as a single construct of two concepts in a single complicated factor to measure its impact on firm performance and strategic flexibility. Certainly, operationalization of IT support core competency would lead to ambiguity among researchers and confusion among managers due to core competency differing from one organization to another, and IT acknowledged as a variety of dimensions. Hence, these studies increased ambiguity rather than clarity to precisely understand what factors (IT assets) positively interact with core competency (e.g., technological, marketing, and functionality competencies) to yield strategic benefits. Therefore, this research intended to extend the body of knowledge based on these three primary empirical studies to provide evidence concerning the strategic effect between the firm's resources, capabilities, and competencies on SCA. Thus, we hypothesized:

H2a: IT capability positively influences core competency.

H2b: Core competency mediates the relationship between ITC and SCA.

2.2. IT flexibility, CC, and SCA

Findings by Reddy (2006) found that a lack of IT flexibility impedes the firm's capability to integrate business processes. An empirical examination by Lim (2014) of the effect of flexible IT infrastructure on four dimensions of competitive advantage among USA-SMEs indicated that ITIF positively influences all dimensions, namely (1) quality of products, (2) fast and reliable delivery, (3) production costs, (4) flexibility of product design. Also, the study confirmed that ITIF improves the flexibility of product design. Prior studies (Akkermans et al., 2003; Sambamurthy et al., 2003; Tiwana & Konsynski, 2010; Bush et al., 2010; Lin, 2010) showed that flexibility of IT infrastructure is crucial for firms' SCA. More importantly, based on RBV theory, one main reason can be justified for ITIF and SCA's relationship. According to the RBV definition of resources, ITIF can be a significant resource since it can reduce operational costs, improve product quality and design, and achieve timely delivery, which results in establishing and maintaining a competitive advantage over rivals (Kitsios & Kamariotou, 2018).

This high modularity capability allows firms to decrease the misunderstanding between IT infrastructure and business changes that are prerequisite to overcome competitive challenges in the marketplace. Byrd and Turner (2001) found that the modularity of IT infrastructure positively impacts IT resources, which ultimately leads to creating competitive advantage. Gualandris and Kalchschmidt (2013) demonstrated that the modularity of IT infrastructure is a reliable strategic source for managing core business activities and assisting the interaction between applications and data management capabilities. Hence, it was hypothesized:

H3a: IT flexibility positively influences SCA.

IT resources foster core marketing competencies by effectively increasing responsiveness to market demands, proactively acting with rivals' actions, access to analyzing customer information and inquiries, and then determining their needs and requirements (Ravichandran and Lertwongsatien, 2005). The core focus of marketing competency is the customer, markets, and competitors (Y. Wang et al., 2004); IT knowledge resources are the primary resources for tracking these three major core focus of market competency by gathering valuable data to sense and respond to markets changes, competitors reactions, and fulfilling customer needs quickly (G. Bhatt et al., 2010; Ashrafi, 2015). IT flexibility is able to reallocate, reconfigure, and upgrade business

processes by developing new resources to enhance core competency. Besides, firms leverage IT to boost their product design, strengthen core business activities that yielded greater value-added, upgrading, and determining the scope of business opportunities (Ravichandran and Lertwongsatien, 2005; Celuch et al., 2007).

Technically, ITF leads to developing and creating new products, allowing firms to provide customers with a broader range of products that meet their needs. ITF is the backbone of business processes, which links all activities in line with top-management vision and goals. The design of products is the main factor that affects firms to enhance their growth. Thus, ITF is a critical driving force for enabling firms to produce smart and digital products. However, this research is among the first experiment that investigated the role between IT flexibility (ITF) as an enabler of strategic resources aiming to support the interaction of core competency dimensions (technological, marketing, and integrative competencies) to create SCA. Flexibility of IT resources helps the formulation of core competency dimensions; therefore, ITF has a strategic effect on the firm's SCA. This study emphasized that ITF is an enabling factor to the core competency for achieving SCA. Thus, it was hypothesized:

H3b: IT flexibility positively influences core competency.

H3c: Core competency mediates the relationship between ITF and SCA.

IT connectivity is the ability of IT systems to provide corporations with communications, coordination among all its business units, and links to the outside. However, electronic connectivity helps firms in various ways. An empirical study by Scheel (2005) emphasized that appropriate IT connectivity creates business value through empowering IT resources and integrating and linking various internal core business activities within the firm and its relationships with external stakeholders. Singh et al. (2007) observed that incompatibility of IT infrastructure could negatively affect inter-firm information sharing and communication, thus negatively affecting IT effectiveness. Tallon (2008) indicated that IT compatibility positively affects business and value creation when firms adopt it. Therefore, aligning existing IT compatibility with future IT systems would be strategically and operationally crucial.

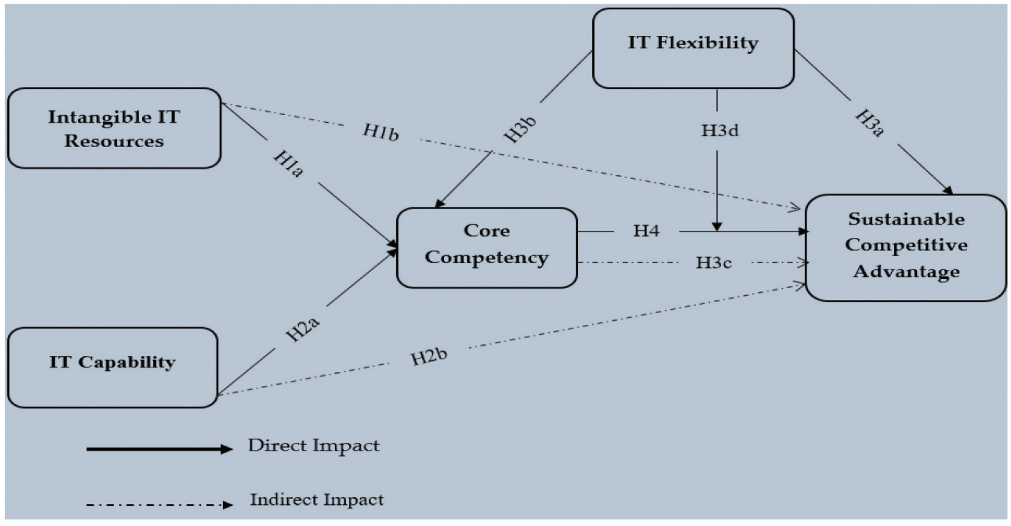
Meanwhile, IT modularity is unified business operations for shareability and reusability, such as modularization of routine systems and structured programming. Changes in product features during the production process probably require a software program to be changed as well. The practical implications of modularity within IT infrastructure are that it enables firms to respond in line with changes in business needs and customer preferences. Therefore, firms significantly require better adaptation in deleting, adding, and modifying their hardware and software components to establish IT infrastructure (S. F. Lin & Bush, 2010; Wadhwa et al., 2005). This high modularity capability allows firms to decrease misunderstanding between IT infrastructure and business changes required to overcome competitive challenges in the marketplace. Byrd and Turner (2001) found that modularity of IT infrastructure has a positive impact on IT resources, leading to enhanced SCA. Sanchez and Mahoney (1996) demonstrated that modularity of IT infrastructure is a strategic source for managing core business activities, assisting interaction between applications, and data management. Hence, it was hypothesized:

H3d: IT flexibility positively moderates the relationship between core competency and SCA.

2.3. Core competency and SCA

Teece et al. (1997) argued that configuring and integrating firms' capabilities would improve existing competencies and continuously create competitive advantages. Banerjee (2003) viewed

Figure 1. Research framework.



core competency as the capacity to operate effectively while sensing business opportunities. Hamel and Prahalad (1990) argued that well-practiced managers should track opportunities through pre-emptive forecasting capabilities that other firms cannot duplicate for a subsequent successful business. Previous researchers (Hafeez et al., 2002; Hamel, 2006; McEvily et al., 2004; Sanchez, 1996; Stelzer & Brecht, 2011) identified technological and marketing competencies as a major asset that drive SCA. Sufficient technological competencies enhance firms to obtain scientific knowledge, leading to upgrade and advance products and processes, yielding new advantages (Rajkovič & Prašnikar, 2009; Stelzer & Brecht, 2011). Local scholars (Mohsen et al., 2011; Ng & Kanagasundaram, 2017; Ratnasingam, 2015) stated that Malaysian SMEs in the wood-based industry have vigorous core activities that enable them to compete in international markets. The main reasons for this thriving industry are due to the capacity of firms to maintain SCA resulting in the well-established IT infrastructure, technological capability, designers, marketing channels, promotions, distributions, skilled foreign workers, following up competitor and customer directions, tracking information about markets and demand, developing new products that suit markets demands and customers' needs, sufficient deployment of IT within business operations especially those activities that need such technologies, and implementing appropriate marketing strategies that suit markets actions and trends. Thus, it was hypothesized:

H4: Core competency positively influences SCA.

Following the discussion above, this study generated a new research model that interrelates five constructs: sustainable competitive advantage, intangible IT resources, IT capability, core competency, and IT flexibility (Figure 1). Applying RBV, it was assumed that a firm's capacity to achieve SCA via deploying distinctive IT resources and capabilities highly depends on IT infrastructure flexibility. Besides, IT flexibility is considered as the leading strategic enabler for empowering firms to gain SCA. So far, how IT flexibility impacts firms to enhance SCA via core competency is yet to be explored. Moreover, these distinctive competencies are dependent on the existence of functional capacities within the corporation IT department and thereby impacted by the knowledge, technological, and relationship resources acquired by the IT department.

3. Methodology

3.1. Sampling and targeted respondents

The focus of this study was on CC and SCA in wood-based SMEs across all Malaysian states. The list of 879 wood-based active firms registered with SMECorp as an official governmental database (2017). Following Krejcie and Morgan (1970) and applying stratified random sampling, the study targeted a sample size of 267 companies. This research aims to obtain data from top-to-middle managers to fulfill the objectives of the study. A hard cover letter attached with questionnaire explaining the importance of the study was sent out to the appropriately selected respondents. A questionnaire was provided by local (Bahasa Melayu) and English language version followed up by calls. To avoid a low-response rate and missing surveys, Wolf et al. (2013) had suggested researchers add 40% of questionnaires to the total sample size (267 + 267*40% = 388). Consequently, this study used self-administered and postal distribution to collect data. Starting from September 2017 to June 2018, out of 388 distributed questionnaire, 182 questionnaires were returned, with 18 being incomplete. Therefore, the study response rate was 42%.

Data were obtained and measured through a 7-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree." To adequately ensure the questionnaire items, an in-depth content validity process was conducted. Six academic experts from the School of Technology Management and Logistics, Universiti Utara Malaysia, were involved in the study process. The study invited two professional experts in the wood-based industry in Kedah, Malaysia, for an interview. The study benefited from experienced experts to further improve the questionnaire items by distinguishing the research model's construct. The final draft was formulated based on academics and professional expert's output. Finally, the study was carried out on a pilot investigation based on 38 firms. The results indicate that all constructs' internal consistency and composite reliability ranged from 0.817 to 0.924, with a high-reliability coefficient. The items were thereby updated and improved accordingly. The final version was then translated into Bahasa Melayu.

3.2. Measurement of variables

Following previous studies covering the context of the present research, the authors developed a measurement tool to fit the wood-based industry study context in Malaysia. Hence, this research used prior studies to adopt items for measuring IT capability dimensions (Technical skills of IT personnel, Business skills of IT personnel, and IT strategic planning) (Ashrafi & Mueller, 2015; Byrd & Turner, 2001), Intangible IT resources (IT knowledge resources and IT relationship resources) (Ashrafi & Mueller, 2015), core competency dimensions (technological competency, marketing competency, and integrative competency) (Wang & Lo, 2003; Y. Wang et al., 2004), IT flexibility (connectivity, modularity, and compatibility) (Byrd & Turner, 2001; Terry Anthony Byrd, 2000), and SCA (Kearns & Lederer, 2003; Tian et al., 2010).

3.3. Profile of respondents and firms

The study targeted respondents holding middle to upper managerial positions in wood-based companies located in all states in Malaysia.

As shown in Table 1, more than 59% of respondents have a long-term business, reflecting the established Malaysian wood-based industry ranked within the top eight major globally. Besides, up to 80% of firms have strong production capacities, shown by a large number of hired employees ranging from 6 to 250 staff, which means that firms possess clear strategies in mobilizing significant tangible (materials) or intangible (patents, design, developed software, and networks) resources. The majority of respondents (59%) have a high education level (postgraduate degree), indicating that they attract skillful employees to develop product quality and design.

4. Data analysis and results

Several statistical researchers viewed the Partial Least Square (PLS) as a valuable statistical tool for well-predicting and assessing measurement and structural models (Henseler et al., 2015). The

Table 1. Background of respondents and firms

Parameter		
Firms age (Years of Operation)	**Frequency**	**Percentage (%)**
Less than 5 years	2314	25.7
From 6 to 10 years	42	40.8
From 11 to 20 years	67	19.5
More than 20 years	32	
Number of employees		
Less than 5	32	19.5
From 6 to 75	89	54.2
From 76 to 200	43	26.2
Education		
High School	2314	27.4
Diploma	45	19.5
Degree (Bachelor)	6439	
Master	32	
Type of ownership		
Sole proprietor	52	31.7
Partnership	33	20.1
Private limited	66	40.2
Limited	13	7.9
Production activity		
Raw material to unfinished	36	21.9
furniture	112	68.2
Raw material to finished furniture	16	9.7
Only finishing and packaging		
Position		
Manager of sales and marketing	72	43.9
Manager of production	51	31
Director of R&D	23	14
CEO	18	10.9

study consists of mediation and moderation constructs suggesting PLS as appropriate for better predictivity (Albort-Morant et al., 2016). PLS does not require a large sample of data that fits the number of data (surveys) collected in this study (Chin, 1998b). This statistical tool allows us to examine all the related tests of both measurement and structural models that should be applied to explore the interrelationships among variables and their output, along with determining the model relevancy Q^2 through blindfolding procedures (Q^2) (Hair et al., 2014).

The study applied an independent samples t-test to detect any possibility of non-response bias (the differences among early and later respondents that probably share the same features). Another inquiry, namely the Levene's test, was conducted to check the equivalence of constructs variance, which was higher than 0.05, indicating the study is free from non-response bias. The significance level requirement was achieved (Pallant, 2011). Furthermore, the research passed measurement errors to clear the model's entire relationships by assessing common method variance (CMV) through a full collinearity test. The results showed that all values of variance inflation factors (VIFs) were lower than 3.3, indicating that the research model is free of CMV (Kock, 2015).

4.1. The measurement model: validity and reliability

This section consists of two-test, namely convergent and discriminant validity. The study examines convergent validity through several tests such as outer loading, factor loading, and average variance extracted (AVE). Table 2 shows that item loading was higher than 0.707 for all variables

Table 2. Measurement model assessment: Loadings, Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE)

Constructs						
1st Order	**2nd Order**	**Items**	**Loadings**	**CA**	**CR**	**AVE**
IT Knowledge Resources		ITKR1	0.75	0.88	0.91	0.59
		ITKR 2	0.79			
		ITKR 3	0.8			
		ITKR 4	0.83			
		ITKR 5	0.76			
		ITKR 6	0.74			
		ITKR 7	0.76			
IT Relationship Resources		ITRR 1	0.77	0.87	0.9	0.61
		ITRR 2	0.79			
		ITRR 3	0.79			
		ITRR 4	0.76			
		ITRR 5	0.82			
		ITRR 6	0.73			
	Intangible IT Resources	IT Knowledge Resources	0.92	0.81	0.91	0.84
		IT Relationship Resources	0.9			
IT Strategic Planning		ITSP1	0.81	0.87	0.9	0.61
		ITSP 2	0.8			
		ITSP 3	0.81			
		ITSP 4	0.8			
		ITSP 5	0.74			
		ITSP 6	0.71			
		ITSP 7	-			
Business Skills of IT Staff		BSITS 1	0.78	0.88	0.9	0.58
		BSITS 2	0.77			
		BSITS 3	0.79			
		BSITS 4	0.76			
		BSITS 5	0.73			
		BSITS 6	0.72			
		BSITS 7	0.76			
	IT Capability	IT Strategic Planning	0.93	0.84	0.92	0.86
		Business Skills of IT Staff	0.92			
Technological Competency		TC 1	0.71	0.75	0.84	0.57
		TC 2	0.78			
		TC 3	-			
		TC 4	0.76			
		TC5	0.77			

(*Continued*)

Table 2. (*Continued*)

Constructs						
1st Order	**2nd Order**	**Items**	**Loadings**	**CA**	**CR**	**AVE**
Market Competency		MC 1	-	0.75	0.84	0.57
		MC 2	0.77			
		MC 3	-			
		MC 4	0.73			
		MC5	0.78			
		MC6	0.73			
		MC7	-			
		MC8	-			
		MC9	-			
Integrative Competency		IC1	0.8	0.84	0.89	0.62
		IC 2	0.71			
		IC 3	-			
		IC 4	0.76			
		IC 5	0.8			
		IC6	0.84			
	Core Competency	Technological Competency	0.72	0.77	0.78	0.55
		Market Competency	0.76			
		Integrative Competency	0.76			
Compatibility		COMP1	0.83	0.87	0.91	0.67
		COMP2	0.86			
		COMP3	0.83			
		COMP4	0.8			
		COMP5	-			
		COMP6	0.75			
Modularity		MODU1	0.75	0.82	0.88	0.65
		MODU2	0.87			
		MODU3	0.78			
		MODU4	0.82			
Connectivity		CONN1	0.85	0.87	0.9	0.66
		CONN2	0.82			
		CONN3	0.83			
		CONN4	0.72			
		CONN5	0.84			
Technical Skills IT Personnel		TSITP1	0.78	0.87	0.9	0.66
		TSITP2	0.83			
		TSITP3	0.85			
		TSITP4	0.82			
		TSITP5	0.76			

(*Continued*)

Constructs						
1st Order	**2nd Order**	**Items**	**Loadings**	**CA**	**CR**	**AVE**
	IT Flexibility	Compatibility	0.92	0.87	0.91	0.72
		Modularity	0.82			
		Connectivity	0.88			
		Technical Skills of IT Personnel	0.76			
Construct	**Items**	**Loading**	**Cronbach's Alpha**	**Composite Reliability**	**Average Variance Extracted**	
Sustainable Competitive Advantage	SCA1	0.82	0.85	0.89	0.63	
	SCA2	0.87				
	SCA3	0.81				
	SCA4	0.74				
	SCA5	0.72				

(Hair et al., 2014). At the same time, composite reliability was higher than 0.7 (Chin, 1998b). Following Hair et al. (2017), all constructs' AVE values were greater than 0.5, suggesting that the study passed the convergent validity test.

The second test that must be applied to prove the measurement model is discriminant validity. The

study used Fornell and Larcker criterion test to compare the correlation between variables with the square root of AVE of a particular construct. As shown in Table 3, the bold values are greater than the values within the respective row and column, suggesting that the measures applied in this research were discriminant. In addition, the results indicated that the outer loading exceeded the cross-loading of all variables and remained valid. Several researchers recently argued that both two previous tests are not sufficient to prove the adequacy of discriminant validity, suggesting the need to perform the Heterotrait-Monotrait (HTMT) ratio (Henseler et al., 2015). This test (HTMT) ratio is used to ensure that the model is well examined by proving the measurement model's effectiveness and adequacy. PLS software allows us to examine the HTMT ratio. Table 3 shows that the values that appeared in the parentheses were less than 0.80, indicating that it fulfills the HTMT ratio values of maximum or below 0.85 (Kline et al., 2012). Following the results of three major test that constitutes the discriminant validity, the study performed and proved it successfully, with the HTMT inference showing a confidence interval of values less than 1.0 for all variables (Henseler et al., 2015).

4.2. Structural model

Figure 2 and Table 4 present the structural model results. Referring to the output of the PLS statistical tool, these hypotheses were tested. The first hypothesis results indicate a significant and positive relationship between ITC and CC (B = 0.199, t = 2.94, p < 0.001). Hence, H1a was supported. IITR was positively and statistically significant on CC (B = 0.370, t = 7.78, p < 0.001), suggesting that H2a was supported. In addition, the results showed that ITF had a positive and significant impact on CC (B = 0.202, t = 2.96, p < 0.01) and SCA (B = 0.370, t = 7.88, p < 0.01) respectively, suggesting that H3a and H3b were supported. Core competency (CC) significantly and positively impact SCA (B = 0.297, t = 6.31, p < 0.001), indicating that H5 was supported. Lastly, CC* ITF's interaction effect had a positive effect on SCA and statistically significant (B = 0.175, t = 4.66, p < 0.01), which means that H3d was supported.

Table 3. Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT)

	BSITS	COMP	CONN	IC	ITKR	ITRR	ITSP	MC	MOD	SCA	TC	TSITP
BSITS	**.76**											
COMP	.57 (.65)	**.81**										
CONN	.49 (.56)	.78 (.70)	**.81**									
IC	.03 (.09)	.21 (.26)	.27 (.38)	**.78**								
ITKR	.57 (.65)	.58 (66)	.51 (.59)	.02 (.09)	**.77**							
ITRR	.62 (.72)	.53 (.62)	.42 (.50)	.07 (.12)	.68 (.78)	**.78**						
ITSP	.72 (.72)	.62 (.71)	.53 (.61)	.02 (.11)	.67 (.76)	.61 (.71)	**.78**					
MC	.04 (.11)	.21 (.27)	.25 (.32)	.69 (.72)	.05 (.12)	.11 (.16)	.06 (.12)	**.75**				
MODU	.50 (.59)	.70 (.29)	.63 (.75)	.30 (.37)	.48 (.56)	.47 (.56)	.48 (.57)	.33 (.42)	**.81**			
SCA	.53 (.61)	.70 (.71)	.68 (.78)	.14 (.23)	.56 (.64)	.56 (.64)	.53 (.60)	.13 (.24)	.59 (.71)	**.80**		
TC	.40 (.50)	.37 (.47)	.32 (.40)	.26 (.32)	.35 (.43)	.43 (.54)	.39 (.50)	.27 (.33)	.29 (.39)	.34 (.43)	**.76**	
TSITP	.66 (.76)	.58 (.67)	.52 (.60)	.11 (.15)	.53 (.61)	.53 (.62)	.64 (.74)	.08 (.12)	.52 (.61)	.54 (62)	.49 (.6)	**.81**

BSITC: Business skills IT Staff; COMP: compatibility; CONN: connectivity; IC: integrative competency; ITKR: IT knowledge resources, ITRR: IT relationship resources; ITSP: IT strategic planning; MC: market competency; MOD: modularity; SCA: sustainable competitive advantage; TC: technological competency; TSITC: technical skills IT personnel.

Table 4. Structural model analysis results

H		Relationship	Std Beta	T-value (2-tailed)	*P*-value	f^2
Decision						
H1a	ITC -> CC	0.199	2.94	0.000	0.031	Supported
H2a	IITR -> CC	0.370	7.78	0.000	0.187	supported
H3a	ITF -> CC	0.202	2.96	0.000	0.034	Supported
H3b	ITF -> SCA	0.370	7.88	0.000	0.181	Supported
H4	CC -> SCA	0.297	6.31	0.000	0.117	Supported
H3d	CC*ITF -> SCA	0.175	4.66	0.000	0.058	Supported

SCA: Sustainable Competitive Advantage; CC: Core Competency; ITIF: IT Infrastructure Flexibility; ITC: IT Capability; IITR: Intangible IT Resources; $^{**}p < 0.01$; $^{*}p < 0.05$.

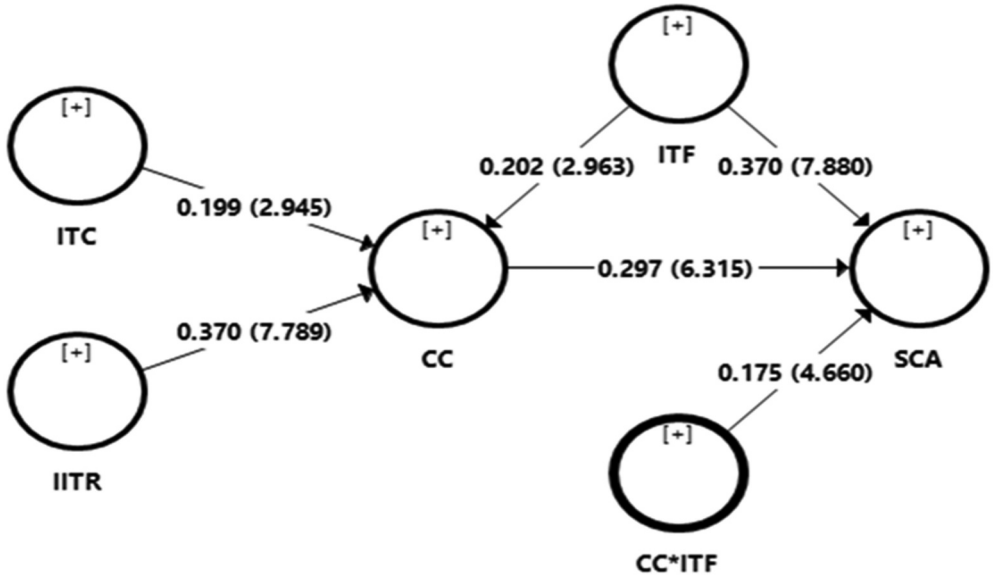


Figure 2. Structural model.

Note: ITC: IT capability; IITR: Intangible IT resources; CC: Core competency; ITF: IT flexibility; SCA: Sustainable competitive advantage.

4.3. Effect size of the model

Testing the effect size of the independent variables on related dependent ones can determine the extent of these constructs being connected and affected to CC and SCA simultaneously to demonstrate the model's strength (Hair et al., 2014). As presented in Table 4, the effect size of ITC and ITF on CC were 0.031 and 0.034, respectively, suggesting that the effects were small. Whereas the effect size of IITR on CC was 0.187 and ITF on SCA was 0.181, the effect size was medium. Meanwhile, CC possessed weak effect size (f^2 = 0.117) on SCA. The interaction effect size of CC*ITF on SCA was also weak (f^2 = 0.058) (Cohen, 1988). These constructs explained high-value variance of R-square (36%) on CC, and SCA (38%), indicating reliable relationships between dependent variables (see Table 8).

4.4. The mediation effect of CC

By applying the Preacher and Hayes approach (Preacher & Hayes, 2004, 2008), the study determined the mediation impact of CC between ITC, IITR, and ITF on SCA. Therefore, the bootstrapping procedure was applied to test indirect effects. Results indicated that the indirect effect (ITC -> CC -> SCA) had a B value of 0.059 and a value of 2.29. Following Hair et al. (2013), the variance accounted for (VAF) was calculated to determine the indirect effect size in relation to the total

Table 5. Results of the mediation model

H							
Relationship	**Std- B**	**T-value (2-tailed)**	***P*-value**	**Confidence Interval**		**Decision**	
				2.50%	**97.50%**		
H1b	ITC -> CC -> SCA	0.059	2.29	0.000	0.021	0.106	Supported
H2b	IITR -> CC -> SCA	0.11	4.71	0.001	0.073	0.15	Supported
H3c	ITF -> CC -> SCA	0.06	3.07	0.000	0.027	0.091	Supported

Sustainable Competitive Advantage; CC: Core Competency; ITIF: IT Infrastructure Flexibility; ITC: IT Capability; ITR: IT Resources; $^{**}p < .01$; $^{*}p < .05$.

Table 6. Variance Accounted for (VAF) of the Mediator Variable for CC

IVs	MeV	DV	Indirect effect	Total effect	VAF (%)	Type
ITC	CC	SCA	0.059	0.199	29.6	Partially
IITR	CC	SCA	0.11	0.370	29.7	Partially
ITF	CC	SCA	0.06	0.202	29.7	Partially

IVs: Independent variable; MeV: Mediator variable; ITC: IT capability; IITR: Intangible IT resources; ITF: IT flexibility; CC: Core competency; SCA: sustainable competitive advantage.

effect. Thus, the VAF = direct effect/total effect had a value of 0.059/0.199 = 0296, which indicated that 29.6% of the ITC effect on SCA was explained via the existence of the mediation effect of CC. Since the VAF was greater than 20% but less than 80%, CC partially mediated this relationship; thus, H1b was supported. Results in Tables 5 and 6 show that the indirect effect (IITR -> CC-> SCA) had B = 0.011, t = 4.71, respectively. Hence, VAF = 0.011/0.370 = 0.297, indicating that 29.7% of the IITR effect on SCA was explained by CC's mediation effect, inferring that this relationship was partially mediated. Thus, H2b was supported (see Tables 5 and 6).

Lastly, the mediation effect of CC between ITF and SCA was B = 0.06, t = 3.07, $p < 0.001$. The VAF value was 0.06/0.202 = 0.297, indicating that 29.7% of ITF affecting SCA is explained by the mediation effect of CC. Hence, this relationship was partially mediated, supporting H3c (see Tables 5 and 6).

4.5. The moderation effect of ITF

The study utilized the product indicator approach (Henseler & Fassott, 2010) to determine the strength of the moderation effect of IT flexibility (ITF) between CC and SCA.

Table 7 shows that IT flexibility positively strength the relationship between CC and SCA (B = 0.175, t = 4.66, $p < 0.001$). Thus, H3d is supported.

Table 7. Results of the moderation effect of IT flexibility

	Relationship	Beta	T-Value 2 tailed	*P*-value	f^2	Decision
H3d	CC*ITF -> SCA	0.175	4.66	0.000	0.058	Supported

Figure 3. Moderation effects.

Note: CC: Core competency; SCA: Sustainable competitive advantage; ITF: IT flexibility.

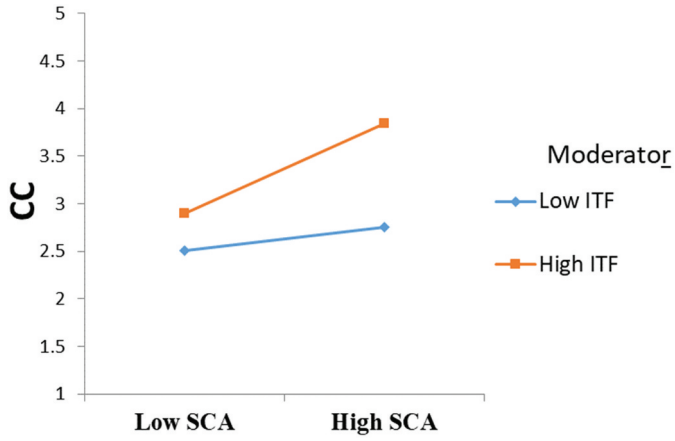


Table 8. Results of variance explained by constructs and predictive relevance of the research model

Construct	Variance Explained R^2	Predictive Relevance Q^2
Core Competency (CC)	0.362	0.341
Sustainable Competitive Advantage (SCA)	0.389	0.371

Figure 3 shows that the presence of the moderator variable, ITF, affected the intensity of the positive relationship between CC and SCA (B = 0.175; t = 4.66). This result suggested that higher IT flexibility infrastructure has a greater effect on core competency to achieve more SCA.

Using Smart-PLS 3.0, this study applied blindfolding procedures (Geisser, 1975) to determine the predictive relevance Q^2 value for CC and SCA. Chin (1998b) suggested that values greater than zero can predict that the model is relevant. The nearer the Q^2 value is to 1 would indicate the model's greater relevance, suggesting a better empirical interpretation of the issue under study (Chin, 1998b). As stated in Table 8, the values of CC and SCA's predictive relevance were 0.341 and 0.371, respectively. As shown from these Q^2 values (Table 8), when CC is more relevant, which suggests more power, SCA's influence is more significant and further impacted. This relationship between CC and SCA empowered by combining the three crucial building blocks of SCA (resources, capabilities, and competencies), as explained through the structural model, addressing SCA's pertinent issues.

5. Discussion

This study examined the missing link between intangible IT resources, IT capability, and core competency enabled by IT flexibility toward achieving SCA. Unlike past studies, this empirical research found that by determining core activities that generate high added value, integrating IT flexibility into these core activities is strategically required to ensure high responsiveness to address business fluctuations. The study findings showed that intangible IT resources, IT capability, and IT flexibility possess positive and significant impacts on core competency and SCA (Table 4 and Figure 2). This suggests that the interaction of IT personnel's business skills and IT knowledge resources enable market competency. This, in turn, leads to enhance core competency resulting in SCA being achieved. IT connectivity plays a significant role in analyzing customers, competitors, and market information absorbed and assimilated into the business strategy, enabling market-driven competencies to respond to high external pressures. Besides, IT personnel skills with high IT expertise would improve firms by reallocating resources, upgrading product design, reconfiguring business processes, and advancing product systems to enhance technological competencies.

These benefits provided by the integration of IT applications into core competencies are a crucial driver of SCA.

Past studies (Ravichandran and Chalermsak, 2005; Rivard et al., 2006) examined the effect of IT support core competency on firm performance. A recent study by Yang et al. (2017) found that IT flexibility positively moderates the relationship between IT support core competency and strategic flexibility, with the latter possessing a greater effect on firm performance. This study's findings are in line with these studies' results, suggesting that IT flexibility is an enabler of strategic resources for IT-based assets and core competency on SCA. In addition, findings showed that the relationship between ITF and SCA is positive and significant, consistent with past studies (Brozovic, 2016; Lim & Trimi, 2014). An empirical examination by Lim (2014) tested flexible IT infrastructure on four dimensions of competitive advantage among USA-SMEs, indicating that ITIF positively influences all dimensions, namely quality of products, fast and reliable delivery, production costs, and flexibility of products design. Also, the study confirmed that ITIF improves product design flexibility and enhances product quality. Findings by Reddy (2006) found that a lack of IT flexibility impedes the firm's capability to integrate business processes.

This study showed that the relationship between core competency and SCA is positive and statistically significant. The obtained results are consistent with past studies' findings (Yonggui Coates & McDermott, 2002; Hsiao & Hsu, 2018; Y. Wang et al., 2004). Local scholars Hamel & Prahalad, 1990Ratnasingam, 2015; Ng & Kanagasundaram, 2017; Mohsen et al., 2011) stated that Malaysian SMEs in the wood-based industry have vigorous core activities that enable the industry to grow and compete in international markets (Ratnasingam et al., 2018). This study's findings suggested Malaysia's wood-based industry enhanced regional and global competitiveness by exploiting technological competencies and exploring market-driven competencies. This, in turn, resulted in acquiring practices and improving business skills to ensure advancement. Malaysian wood-based SMEs possess high product quality, reflecting the art of design developed by integrating IT applications into business processes and upgrading their design, which is the driving force to compete in international markets.

5.1. Theoretical contribution

This research's core focus was to cover the gaps in literature where past studies theoretically and empirically overlooked the critical impact of IT flexibility, IT resources, and IT capability on core competency to achieve SCA. Thus, this study examined the interrelationships between these constructs. Three published studies have introduced IT support competency as an enabling factor on firm performance. Measuring IT support core competency on firm performance might theoretically be insufficient to indicate IT's interaction impact on core competency in assessing firm performance (Yang et al., 2017). Theorizing and measuring these two concepts in a single factor lead to ambiguity of understanding and increase the debate among scholars about core competency and its relationship with other organizational factors.

However, this study provided significant theoretical evidence that examined the effect of different IT assets on core competency to achieve SCA, thus, bridging the critical gap. This study also supports managers and professionals by providing strategic, practical solutions about the importance of achieving a close integration of IT assets within core competencies. This study identified core competency as a mediator of the linkage between ITF, ITC, IITR, and SCA, contributing to discovering new organizational practices to understand business value. Yang et al. (2017) found that the interaction impact of IT flexibility's moderating role on the relationship between IT support core competency and strategic flexibility is positive and significant. However, Yang et al. (2017) failed to determine which IT factor integrates and contributes to core competency in achieving high strategic flexibility. This issue was raised for further investigation in separating these two concepts to appropriately assess what kind of IT assets truly contribute to firm performance and SCA. Furthermore, IT flexibility provides firms with a seamless flow of information (data) across all business departments, which resulted from supporting technological competencies by upgrading product design, processes, and reconfiguration of production

systems, and at the same time enabling market-driven competencies. These strategic benefits resulted from IT's close interaction within core competency areas, suggesting the need for further investigation.

5.2. Practical implication of the study

This study's findings suggested that IT capability is a vital beneficial factor contributing to the SCA of Malaysian wood-based SMEs. Hence, managers are encouraged to revisit their strategies to mobilize and upgrade their IT staff in technical matters. Managers are strongly motivated to determine what kind of core competencies need to be identified and focused on and how to link them with other organizational resources/capabilities to ensure survival. Due to the limitation of resources and capabilities that faces this low-tech industry, Malaysian SMEs must collaborate and create synergetic links with other institutions and firms to ensure access to other critical complementary resources.

Ratnasingam (2015) observed insufficient attention given by the Malaysian government regarding inadequate procedures, policies, strategies, budgets, and programs (Ratnasingam et al., 2018). These SMEs need to advance their IT infrastructure to support survival and growth, especially in overcoming cheap producing furniture factories in China and Vietnam. Thus, the more firms possess high IT flexibility, the faster they can respond to customer changes and become the strongest. This study addressed a severe issue recognized by scholars globally, where low-tech wood-based industry receives insufficient attention from policymakers and academicians. In Malaysia, the wood-based industry receives less attention from society and government due to its specific 3D (dusty, dirty, and dangerous) characterization.

Malaysian SMEs are encouraged to join clusters and avoid establishing a home-based business to build networks and cooperate with other firms. This leads to the empowerment of capabilities in accessing resources/innovations provided within this cluster. Since the vision of the Malaysian government 2020 is to transform the low-tech wood-based industry into a high-tech sector and consider this new era of industrial revolution 4.0, this study is regarded as the first investigation that provides crucial findings on this industry. Hence, this research can be a platform for subsequent Malaysian policies and programs that need to be implemented to support the industry to be transformed into smart factories shortly.

5.3. Limitations and recommendation for future research

Even though this study supported the hypotheses between the variables; however, the results are also exposed to some limitations. SCA is one of the strategic issues at the heart of the strategic management perspective. This study's findings supported that integration of business resources and capabilities together creates strategic business value. The interaction of IT flexibility, intangible IT resources, and core competency directly influences SCA. However, to provide a more in-depth understanding of ITF's effect on other IT capabilities, a longitudinal study is required to compare the overall impact of ITF on IT capabilities, IT resources, and core competency on SCA over time.

This study focused on a single low-tech industry in which the findings may not be generalized to all Malaysian SMEs. Thus, this study's findings suggested that the differences in terms of firm size, business environment, context, and culture may play significant roles in influencing these building blocks of SCA. Therefore, future studies should include large firms and other industries to examine the effect of these resources, capabilities, and competencies. This study's findings indicated that the research model explained 38% of the total variance in SCA, which means that several other factors could probably significantly explain the rest of the SCA variance (of up to the remaining 62%). Therefore, this study recommended that subsequent studies explore other factors, such as green innovation, innovation ambidexterity, organizational culture, open software development, and government support. Also, since core competency is recognized as the leading driving force of SCA, subsequent studies are encouraged to explore other factors that influence CC to ensure SCA enhancement.

To conclude, this study examined the strategic effect of the previously missing link between resources, capabilities, and competencies into a single model in SCA's strategic management, an overlooked issue

due to poor understanding and lack of studies on these factor relationships. This study also provided theoretical and empirical evidence for the effect of IT flexibility, Intangible IT resources, IT capability, and core competency on SCA of Malaysian wood-based SMEs. Hence, this study's developed framework has a significant contribution and extends dynamic capability and RBV theories, highlighting that the understanding of SCA is a serious issue that managers face globally. Thus, there is a need to combine these bundles of approaches in a single model that is utmost strategically important to genuinely support the body of knowledge in strategic management literature concerning the SCA phenomenon.

Acknowledgements
The authors extend their appreciation to the Deanship of Scientific Research at King Khalid University for funding this work through research groups program under grant number (G.R.P.2/176/42).

Funding
The authors received no direct funding for this research.

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Conflicts of interest/Competing interests
The authors have no conflicts of interest to declare that are relevant to the content of this article.

correction
This article has been republished with minor changes. These changes do not impact the academic content of the article.

Citation information
Cite this article as: Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency, Lahcene Makhloufi, Noorulsadiqin Azbiya Yaacob, Abderrazak Ahmed Laghouag, Alhussain Ali Sahli & Fateh Belaid, *Cogent Business & Management* (2021), 8: 1935665.

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