# Impact of integrated audit management effectiveness on business sustainability in manufacturing firms

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## Abstract

**Purpose** – This study aims to investigate the effectiveness of integrated audit management and its impact on business sustainability for an emerging economy.

**Design/methodology/approach** – Drawing on the dynamic capability and contingency theory, the authors investigated the factors on integrated audit management implementation using a sample of 104 certified Malaysian manufacturing firms. The collected data has been analysed using the partial least squares through the structural equation modelling technique.

**Findings** – The findings have revealed that human resource capability, technological capability and quality capability have a robust influence on the importance of the internal audit process, which, in turn, leads to integrated audit management effectiveness towards the outcome of business sustainability. The results have also indicated the mediating effect of the internal audit process on the research model.

**Originality/value** – The contribution from the empirical findings will provide productive insights to help manufacturing firms devise an effective integrated internal audit management system to ensure business sustainability and increase competitiveness advantages for an emerging economy.

**Keywords** Business sustainability, Audit process, Production and operations management, Manufacturing firm, Audit management, Human resource capability, Technology capability

**Paper type** Research paper

## 1. Introduction

The integrated management system (IMS) has become a huge potential for evolving organisational performance in business sustainability (Ikram, *et al.*, 2020). Business sustainability for this study refers to the firm having attained a significant increase in the general level of revenues, market share, investment, profitability and development in its overall environmental circumstances. The business integration solutions should be developed to help companies to take advantage of standards-based capabilities to improve the efficiency and reliability of the business. In this regards, this study highlights the question: "What is the impact of integrated audit management effectiveness on business sustainability in manufacturing firms?" Many firms have started to implement an integrated audit management system. The integration process is used to achieve an IMS. The ISO 19011 standard defines auditing as a process that is systematic, independent and well documented to obtain evidence of the audit. In this process, audits are evaluated to

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identify the level of audit criteria achievement. The standard also defines that a combined audit involves the simultaneous auditing of two or more management systems on aspects of quality (ISO 9001), environment (ISO 14001), occupational health and safety (Domingues, *et al.*, 2016). There are still only a small number of firms with ISO certifications that implement an IMS, as compared to other developed countries (FMM Directory, 2017). For many companies, the implementation of a process-based management system is fundamental because continuous improvement is achieved which can be measured through product quality and customer satisfaction. The implementation of a quality management system also emphasises process control and process improvement. Integrating these standards into a single Malaysian standard (MS) will minimise the documentation and management processes, which, in turn, reduces the expense for maintenance and administration.

Internal audit management is conducted to assess compliance towards a management system, development of the economy and emerging markets (Paraschi *et al.*, 2019; Chiarini, *et al.*, 2020). Internal audits can be used to analyse quality tools and to improve businesses. In line with this, internal audits could be combined as an integrated audit management effectiveness to optimise resources when an organisation has more than one management system (Hoy and Foley, 2015). Integrated audit management effectiveness can lead to task simplification and reduce repetitive processes, procedures and documentation. In this light, ISO 9001 and ISO 14001 each have their own staff education and training requirements. Casadesús *et al.* (2011) indicated that 90.3% of the respondents believed that the combination of ISO 9001 and ISO 14001 can simplify documentation. The implementation of an IMS has raised several challenges in Malaysia on internal capabilities issues. The quality practitioners of the country are not familiar enough with the management system standards to allow them to perform integrated audit management effectiveness (Kraus and Grosskopf, 2008). The expected improvement might lead to poor audit methods and practices (Asif, *et al.*, 2009), and auditors will be forced to do auditing that is beyond their understanding (Chaney and Kim, 2007). The country has several challenges such as a lack of consistent standards, processes, audits, risk management and problem-solving across firms.

In Malaysia, there is a lack of central access for quality data; integration between quality, audit practices, and business planning efforts; and a lack of flexibility and functionality of current practices because of capabilities issues (AIAG, 2015). Thus, the main motivation of this study has aimed to investigate whether human resource capability, technological capability, audit process and quality capability could lead to integrated audit management effectiveness among the manufacturing firms in Malaysia. To examine this objective, this study has applied the partial least squares (PLS) technique by using structural equation modelling (SEM). The study discovered that internal capabilities, internal audit processes and aspects of integrated audit management effectiveness are crucial factors for the business sustainability of manufacturing firms. As audit capabilities and effectiveness are the crucial business strategies to develop the business performance, this study explains the relevant literature on human resource capability, technological capability, quality capability and audit process, which could support the dynamic capability theory (DCT) for business sustainability in manufacturing firms.

## 2. Literature review

### *2.1 Audit management system in Malaysia*

Audit management is conducted to assess compliance towards a management system as part of progressive development (Petrescu *et al.*, 2021). In Malaysia, it is not compulsory for firms to have compliance and certification regarding management systems standards (MSSs). This study has highlighted that MSS is an important aspect of business

sustainability. MSSs can help managers to create an efficient and comprehensive internal audit of the management system which is based on international standards (Muzaimi *et al.*, 2018). It also helps managers to effectively implement audit information for the system to improve the performance of business sustainability. In the Federation of Malaysian Manufacturers (FMM), one of the pertinent challenges faced by manufacturers is industrial waste management. Manufacturers are responsible to sustainably manage their industrial and hazardous waste by adopting more environmentally friendly approaches. As a result, sustainability has become a significant aspect that influences purchasing decisions.

### *2.2 Human resource capability*

Human resource capability refers to the stable employment of co-workers, long-term training of multi-skilled workers, wage system based on skill accumulation (experience), internal promotion, employer/employees' relationship, communication and worker motivation (Newaz *et al.*, 2020). In the context of an integrated audit, people are valuable resources for a company where everyone including the management staff are important. Newaz *et al.* (2020) reported that auditors and auditees play significant roles in an integrated audit management system. The presence of quality auditors could significantly increase the ability to identify the audit process, such as conformity, and result in increasing the value of the management system (Tirkolaee *et al.*, 2020; Kaziliūnas, 2008). The implementation of internal audits could enhance the employees' drive to deliver quality work processes and enhance the quality management systems. In this light, in addition to awarding certification, many certified organisations expect auditors to share their experiences and knowledge and put forward recommendations for improvements. There are many challenges in the full implementation of human resource capability in the internal audit process (Azungah, *et al.*, 2020). These include aspects such as the lack of human resources, lack of management support, departmentalisation of functions and individual concerns of the people involved (Asif *et al.*, 2010). This reflects that it is important for firms to know the human resource capability and their strength to care for an internal audit process to avoid failure of business sustainability. The general strategies adopted by an organisation should be combined with different management standards to achieve the audit process (Zeng *et al.*, 2010). Apart from the focus on human resource capability, the audit process will lead to cost savings and better deployment of human, material and information resources. A unified problem-solving approach will increase the efficiency and effectiveness of other interlinked systems (Jørgensen *et al.*, 2006). Savino and Batbaatar (2015) identified human resources as a crucial component when conducting the internal audit process. Savino and Batbaatar (2015) stated that human resources play a more crucial role in determining the audit process. Zeng *et al.* (2007) indicated that because of the lack of human resources, most staff members are now becoming better at multi-tasking, which helps the implementation of the internal audit process for the emerging market of business sustainability. In light of the preceding argument, the following hypothesis has been proposed for empirical testing:

*H1*. Human resource capability positively influences the internal audit process.

### *2.3 Technological capability*

The rapid development of information technology (IT) has changed how we live in today's world. This includes how business processes are being performed. Today, business has become increasingly reliant on technology infrastructure and creating a complex link between IT and business processes (Karabag, 2019; Venkatesh, 2006). Arena *et al.* (2010)

pointed out that technology plays a critical role in providing the capability to incorporate audit processes across the various business units. According to Helpert and Lazarine (2009), businesses should have technological capability or strength, which leads the audit process to the ultimate goal of business sustainability for emerging markets. As technological capability leads to the interdependency aspects of the audit process, it is more likely to identify material risks and provide more comprehensive solutions (Brand and Sagett, 2011). The technological capability could potentially increase the efficiency of the audit process (Brand and Sagett, 2011). Organisations apply a technological approach to maintain organisation-wide information sharing that helps create an organisational response to risks (Mikes, 2011; Shukor *et al.*, 2020). Yang and Guan (2004) thought that technology adoption by businesses may lead to an effective auditing process and internal control, which may help auditors to perform audits more efficiently. These guidelines for IT lead to the audit process, which enhance the control function of the firms (Chang *et al.*, 2008). Thus, the implementation of technological capability is seen as a strategy to provide companies with the ability to monitor the market and environmental changes. Thus, we have proposed the following hypothesis:

*H2.* Technological capability positively influences the internal audit process.

### *2.4 Quality capability*

Quality capability is defined as a firm's relative performance on various quality dimensions, such as quality tools. Sousa and Voss (2002) suggested the use of the total quality management dimension for improving the quality management of the firms. Quality capability helps firms gain customer loyalty and achieve a competitive edge (Rahman and Jalil, 2014; Rahman, 2014), thus, it is deemed as a source of sustainable advantage (Qamari *et al.*, 2020). Organisations have used various quality capabilities as strategies to improve their daily operations. A massive effort is vital to achieving the internal audit process of management systems; as a result, small-to-medium organisations (e.g. manufacturing and services) may struggle to take this assessment because of the economy of scale. Ho (2012) believed that 5S, total quality management dimensions and total preventive maintenance are quality capabilities that lead to the audit management process. In doing business, firms' quality capabilities could be a strategic way to manage the behavioural changes for each of the quality initiatives introduced (Kumar *et al.*, 2020). In this light, quality capability is used as one of the tools to improve the internal audit process, and at the same time, continue the benefits gained from the audits, such as process improvements (Hoy and Foley, 2015). Chang *et al.* (2003) suggested developing quality capabilities to improve the audit process towards business sustainability. Thus, the above explanation led to the following hypothesis:

*H3.* Quality capability positively influences the internal audit process.

### *2.5 Internal audit process*

An effective audit reflects the audit's ability to fulfil its intended objectives. The audit process should be able to accommodate any changes that have happened in the business. For manufacturing firms, the main reason for implementing the internal audit process is to achieve compliance with the management system and continuous improvement, as well as to review current conditions (Spasojevic Brkic *et al.*, 2013). This is evident in the nuclear manufacturing industry which has seen rapid changes in terms of advanced technology,

safety risks and others where the audit process is needed. The audit process must be linked to a perspective on operational improvement and integrated audit management effectiveness. It implies that a high level of internal audit process in management, investment and profitability can lead to more synergy towards business sustainability in the emerging market (Beckmerhagen *et al.*, 2004). Karapetrovic and Willborn (2002) stated that the internal audit process includes the audit plan as an input and audit report as an output. Audit resources can reflect the integrated audit management effectiveness (Petrescu *et al.*, 2021). Thus, we postulated the following hypothesis:

*H4*. The internal audit process positively influences integrated audit management effectiveness.

*2.6 Integrated audit management effectiveness*

Numerous studies have focused on the effectiveness of management systems (Newaz *et al.*, 2020; Selim *et al.*, 2019; Rahman and Zailani, 2017) such as OSHAS 18001 in improving operating performance. In this light, a majority of these studies demonstrated the role played by OSHAS 18001 in ensuring compliance with legislation, improving working conditions, increasing the efficiency of management practices and improving internal safety communication which encompasses safety rules and procedures for business sustainability (Bansal and DesJardine, 2014). The previous studies reported that the implementation of management systems is hindered because of a lack of employee motivation (Newaz *et al.*, 2020), bureaucracy, challenges in changing a company's ethics and working culture and the high cost for certification. There are many suggestions to improve a firm's effectiveness by minimising the costs and maximising the benefits. The audit documentation is the coordination of information (Bamber *et al.*, 2004); while, implementing integrated audit management effectiveness is important to ensure the success of the systems as well as sustain the business for the emerging economy. Sustainable development applies not only to pollution control, the availability of natural resources and protecting species and their ecosystems but also to human and social development, which leads to business sustainability for an emerging economy. Business sustainability performance can be referred to as the fulfilling and balancing between current and future stakeholder requirements to maximise the profitability without tarnishing the human and natural resources in the short or long term. Yet, there are great challenges to bring these ambitions into practice. Abisourour *et al.* (2020) indicated that integrated management effectiveness is strongest when companies incorporate a sustainable development performance into mainstream business strategy. Thus, we proposed that:

*H5*. Integrated audit management effectiveness positively influences business sustainability.

*2.7 Mediating the impact of the internal audit process*

The audit process is one of the processes and documented procedures that are required to monitor that the company ensures the adherence of the system to the standards. The internal audit process remains the objective requisite to assess the effective implementation of the management systems of the company (Hernandez, 2010). Past works have considered practitioners' perspectives, and studies such as De Oliveira (2013) proposed the individuation of six basic steps to integrate the management systems. Out of the six steps, monitoring and measuring for improvement of the audit process has been deemed as the

most relevant to the progress in this research as this study has acknowledged the early seminal individuation of some common resources, such as internal and external audits and corrective actions. Thus, De Oliveira (2013) has partially inspired this present study to investigate the core resources for an IMS, along with some previous findings relative to an IMS's continuous improvement (Savino and Mazza, 2014). Brun *et al.* (2011) postulated that the implementation of an IMS has become an important activity in improving firm performance and effectiveness. Thus, we proposed that:

*H6.* The internal audit process mediates the effect of (a) human resource capability, (b) technological capability and (c) quality capability on integrated audit management effectiveness.

*2.8 Theoretical foundation and conceptual model*

The DCT is largely taken from the resource-based view (RBV) (Barney, 1991). It stipulates that firms have certain resources, which are stocks of accessible factors that the firm owns and controls (Amit *et al.*, 1993). A firm's capabilities include employees, technology infrastructure, assets, location and shares. A valuable resource should be able to help firms achieve competitive advantages, and should be rare and difficult to be imitated by other firms (Barney, 1991). Researchers have long accepted that organisational capabilities can determine firm performance (Amit *et al.*, 1993). For instance, a firm's organisational capabilities allow it to coordinate its resources effectively (Grant, 1991). The RBV also posits that whether the capabilities are valuable, rare and cannot be reproduced will determine the organisation's attainment of organisational capabilities and competitive advantage (Amit *et al.*, 1993). In the dynamic capabilities theory, firms can integrate, build and reconfigure their competencies and resources (Teece *et al.*, 1997) which are perceived as strategic options. They allow firms to revamp their operational capabilities when the need arises. Organisations will be able to execute strategic changes to adapt to a new environment. It was found that the DCT could more accurately describe firm performance than RBV as reflected in recent meta-analyses of past empirical studies (Fainshmidt *et al.*, 2016). Therefore, in this study, the DCT has been applied to explain the firms' capabilities that influence their integrated audit management effectiveness in achieving business sustainability.

Although researchers have devoted considerable effort to understanding the relationship between firms' audit capabilities and integrated audit management effectiveness, the literature shows only a few studies from an emerging economy. The study on IMS in the Malaysian manufacturing industry is still inadequate and this statement is supported by empirical studies on the internal audit integration being limited (Bernardo *et al.*, 2010). In the context of Malaysia, there is no specific study on integrated audit management effectiveness. However, various studies have briefly discussed the implementation of an IMS and the concept of sustainability. Other studies have focused on the critical success factors of IMS implementation, awareness of IMS implementation (Arifin *et al.*, 2009), Malaysia's efforts towards achieving sustainable development and the empirical study on the impact of sustainable manufacturing practices on sustainability performance (Abdul-Rashid *et al.*, 2017). Therefore, it is timely to conduct a study on integrated audit management effectiveness towards business sustainability for the emerging market in Malaysia and to test the validity of the research framework. The theoretical framework has been built on the premise that internal capabilities and internal audit process play different roles in contributing to the integrated audit management effectiveness. Using the DCT, we have argued that the predictors such as human resource capability, technological capability and quality capability positively affect integrated audit management effectiveness. Also, using

the tenets of contingency perspectives, we proposed that the audit process affects the relationship between audit capabilities and integrated audit management effectiveness.

Integrated audit management effectiveness can be considered as one of the business strategies that can lead to operational performance improvement and strategic flexibility (Asif *et al.*, 2010) towards business sustainability. According to Savino and Batbaatar (2015), an integrated audit is considered as a core resource for small and medium enterprises. There is no specific way to manage the organisation because it is contingent upon several factors, both internal and external (Amin *et al.*, 2020). Concerning IMS, Zeng *et al.* (2011) found that integrated management effectiveness is a system that provides sustained competitive advantages. Simon *et al.* (2011) concluded that IMS increases synergism and audit results can be used to improve business performance and increase sustainability. Besides that, researchers can assess organisational effectiveness by using a range of variables. This allows researchers to develop contingency models that can be used to achieve different effect goals. In this light, different contextual factors may have different effects on operation practices based on whether we want to focus on operational effectiveness or overall business enterprise performance (Lee *et al.*, 2020). Thus, based on the above discussion, this study has applied the contingency theory to measure how the audit process mediates the relationship between audit capabilities (human resources capability, technological capability and quality capability) and integrated audit management effectiveness. The next section highlights the research framework of the study.

To estimate the conceptual model of the existing study, we depict the key constructs in Figure 1 based on the review of the literature and theoretical underpinning. Using the DCT, we measured the internal capabilities along with the three facets of human resource capability, technological capability and quality capability. Using the contingency theory perspectives, we speculated that the internal audit process is one of the strategies that affect the relationship between internal capabilities and integrated audit management effectiveness towards business sustainability in the emerging economy.

## 3. Research methodology

### *3.1 Measurement instrument*

The survey questionnaire of this study was divided into two sections. The first section asked about the general profile of the organisation and the second section presented the statement on the implementation of integrated audit management effectiveness, internal

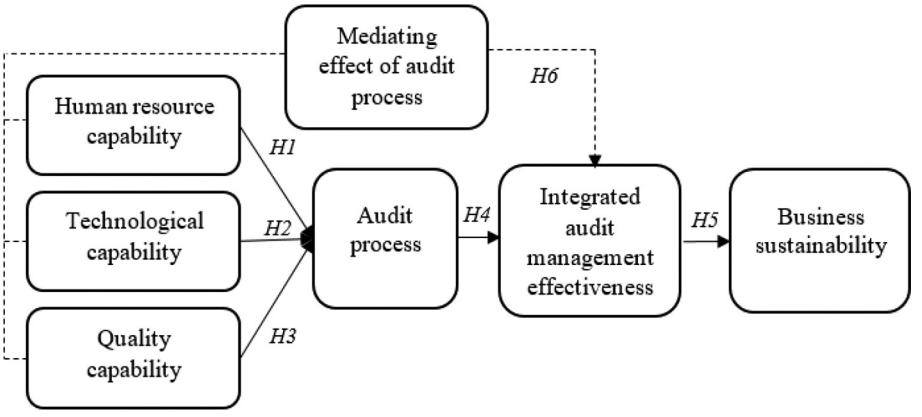


**Figure 1.**
Conceptual framework

audit process, business sustainability, human resource capability, technological capability and quality capability. These data were important for the profiling of the companies that participated in the survey. Seven items were modified from Apenko and Fomina (2021), Rao (2002) and Zhu *et al.* (2007) for evaluating business sustainability. The internal audit process was estimated using five items adapted from Theofanis *et al.* (2011). These items were included in the reasons for having IMS certification, types of integration and type of improvement in achieving IMS. Integrated audit management effectiveness was measured using five items adapted from Beckmerhagen *et al.* (2004). These items were used as the participants were required to provide their views on how external factors, such as a regulator, customer and supplier, affect the effectiveness of integrated audit management. Five items were modified from Naguib *et al.* (2017) and Taylor and Taylor (2013) to estimate the human resource capability. The technological capability comprising four items were adapted from Savino and Batbaatar (2015), Naguib *et al.* (2017) and Arnold *et al.* (2015). Five items were adapted from Chang, *et al.* (2003) to estimate the quality capability.

The questionnaires were organised in the format of a scaled-response form. This method helped to decrease the response biases and provide a situation where the participants would feel comfortable in answering the questions in the survey. The scale approach assisted the researchers to measure the level of agreeing/disagree decisions of the respondents to simplify the data analysis of the study. The nominal and ordinal scales were used in this study where the nominal scale was particularly designed for the demographic information of the respondents. The items in the questionnaire used a five-point Likert scale, ranging from one to five (1 = strongly disagree and 5 = strongly agree). In this study, the five-point Likert scale was chosen instead of the seven-point Likert scale because Revilla *et al.* (2014) indicated that the five-point Likert scale provides higher mean quality, reliability and validity based on the number of response categories. A five-point Likert-type scale was used to increase the response rate as the questionnaire would be more simplified and gather quality responses while reducing the respondents' frustration levels.

### *3.2 Data collection and sample*

This study has focused on the manufacturing companies in Malaysia that have implemented an IMS. The insights of the management, head of an internal audit and internal auditor were needed to understand and investigate the internal capabilities and their impacts on integrated audit management effectiveness, which, in turn, leads to business sustainability in an emerging economy. The survey method was chosen for this research because precise statistical information can be obtained through this technique (Whitfield and Strauss, 1998). Malaysian manufacturing firms were chosen as manufacturing is one of the leading industries that are boosting the Malaysian economy. The firms were selected based on their experience in integrated internal audit management. The difficulties included barriers in identifying the firms which had the MS certification. It was also convenient to collect information in one Malaysian manufacturing firm as it was the researcher's residential area and job place and, hence, facilitated the ease of communication with the survey.

The organisational aspects may vary because of their practices and management methodologies which lead to different performance dimensions (Su *et al.*, 2008). Thus, the unit of analysis for this study was the organisation, and data was collected at the organisational level. The data and information were gathered from two sources, from the main certification bodies' accreditation in Malaysia – SIRIM and the FMM Directory. A total of 2,800 companies have received various certifications (Federation of Malaysian Manufacturers, 2017). However, for the IMS audit study, the population was 456 firms which were selected as they had adopted at least 2 out of 3 MS (ISO 9001, ISO 14001 and OHSAS

18001). The census sampling was used in this study as the size of the target population was small. A census sampling refers to the quantitative research method where the entire population is small and it should be enumerated. Small area data are normally produced from the unique role of population censuses that bring some values in a study (Baffour *et al.*, 2013). The research was conducted in the Klang Valley area because it is the most concentrated area for the purpose of manufacturing companies and offices. Almost 50% of the manufacturing companies are located in the Klang Valley area (FMM Directory, 2017). Approximately 456 firms were identified as respondents, and out of the 456 firms, 13 companies were selected for the pilot study while 4 were chosen for the preliminary study. The feedback received from the pilot study showed that the questionnaire needed to have two respondents as not all the managers were the internal auditors and some of the internal auditors were not in a managerial post. The feedback received also showed that the questionnaire was well-developed and comprehensive.

The survey questionnaire was prepared in English and translated into Bahasa Malay for this study. Two sets of questionnaires were distributed to the respondents. Every participant in this survey received a five-page questionnaire, inclusive of the cover page. The questionnaire used for data collection in this survey was a structured questionnaire. A total of 439 questionnaires were emailed to the respondents which consisted of senior managers, heads of internal audits and internal auditors to seek their opinions on the effectiveness of integrated audit management. Because of time and cost limitations, the questionnaires were distributed through email (15th January 2019). After filtering the usable completed questionnaires, only 104 questionnaires were accepted for the analysis, which translated to a response rate of 23.69%. The email surveys of small and medium business owners are known for generating "notoriously low response rates". Moreover, business owners in the manufacturing industry are generally reluctant to disclose information. Therefore, the response rate of 23.69% was considered satisfactory in the context of the constraints discussed above.

The study's sample size was determined using G*Power 3.1.9.2. According to Faul *et al.* (2009), G*Power 3.1.9.2 is one of the best analytical software programmes for statistical testing, specifically in the fields of behavioural and social sciences. The "Linear multiple regression: fixed model, $R^2$ deviation from zero" statistical test was used and the effect size was set at 0.15. Meanwhile, the alpha error probability was set at 0.05; power (1-$\beta$ error probability) of 0.80; and based on the theoretical framework, the number of the predictor was 5. Chin (2001) suggests that the actual power of 0.80 and higher showed a satisfactory sample power, the minimum sample size for this study was set at 92.

## 4. Analysis and results

### *4.1 Respondents' information*

The respondents' information is illustrated in Table 1. The findings reveal that the organisations differ in terms of types of industry, ownership status, size of organisation, length of business, number of employees, annual sales turnover, management system implementation and method in conducting an internal audit. The distribution of companies implementing integrated audit management effectiveness is: electrical and electronic (35.6%), chemical (14.4%), others (11.5%), metal and machinery (7.7%), plastic (6.7%), food and beverage (F&B) (5.8%), rubber (2.9%), recycling (2.9%), vehicle (1.9%) and printing and furniture (1.9%). Concerning the ownership status, the majority of the respondents were Malaysian-owned companies (49%) and non-Malaysian owned (43.3%), with almost close approximaty together. Only 7.7% of the respondents were from local and foreign joint ventures. The portion of large (53.8%) and small (46.2%) companies responding were considered as balanced. The majority

| Characteristics | Percentage (%) | Characteristics | Internal auditor (%) | Management (%) |
|---|---|---|---|---|
| Types of industry | | Position | | |
| F&B, tobacco | 5.8 | Head of auditor | 39.4 | – |
| Chemical | 14.4 | Internal auditor | 60.6 | – |
| Electrical and electronic | 35.6 | CEO | – | 6.7 |
| Fabricated metal | 7.7 | Managing director | – | 10.6 |
| Machinery | 7.7 | General manager | – | 18.3 |
| Plastic | 6.7 | Senior manager | – | 9.6 |
| Vehicle and equipment | 1.9 | Manager | – | 40.4 |
| Paper printing | 1.9 | Others | – | 14.4 |
| Rubber | 2.9 | No. of services | | |
| Furniture | 1.0 | Less than 5 years | 34.6 | 24.0 |
| Recycling | 2.9 | 5–10 years | 30.8 | 35.6 |
| Others | 11.5 | 11–20 years | 21.2 | 39.4 |
| Ownership status | | More than 20 years | 13.5 | – |
| Malaysian owned | 49.0 | Gender | | |
| Local and foreign joint ventures | 7.7 | Male | 61.5 | 69.2 |
| Non-Malaysian owned | 43.3 | Female | 38.5 | 30.8 |
| Larger organisation? | | Age | | |
| Yes | 53.8 | 25–35 | 11.5 | 9.6 |
| No | 46.2 | 36–45 | 44.2 | 35.6 |
| Length in business | | 46–55 | 40.4 | 50.0 |
| Less than 5 years | 1.9 | 56 and above | 3.8 | 4.8 |
| 6–10 years | 10.6 | Education | | |
| 11–20 years | 23.1 | PhD | 1.9 | 1.9 |
| 21–30 years | 30.8 | Master | 12.5 | 18.3 |
| More than 30 years | 33.7 | Degree | 64.4 | 63.5 |
| | | Diploma | 11.5 | 8.7 |
| | | Professional certificate | 9.6 | 7.7 |

**Table 1.**
Demographic profile

(87.6%) of the companies have implemented IMS for more than 10 years whereas only 12.4% of companies have implemented IMS for less than 10 years. Regarding the number of employees, the organisations were divided into three: large companies with more than 500 employees (36.6%), small companies with less than 100 employees (25.0%) and medium-sized companies with employees ranging between 100 and 499 employees (38.4%). In terms of their annual sales turnover, 44.1%, of the organisations made profits more than RM50,000,000, 22.1% made profits between RM15,000,001 and RM50,000,000, and 31.7% made RM300,001 and RM15,000,000, and only 1% of the respondents recorded an annual sales turnover of less than RM300,000. The result shows that 91.3% of the respondents' companies have implemented integrated audit management effectiveness while 8.7% implemented stand-alone MS. 87.5% of the respondents conducted an internal in-house audit, whereas 12.5% of the companies outsourced their auditing processes.

Based on Table 1, in all, 104 respondents comprised of internal auditor and management staff were included in the final data set as valid samples. The analysis of the respondent's information reveals that 60.6% of the respondents were internal auditors and 39.4% were heads of auditors. For managerial level category information, the highest level of the respondents were from managers (40.4%), followed by general managers (18.3%), others (14.4%), managing directors (10.6%), senior managers (9.6%) and chief executive officers (CEOs) (6.7%). For auditor length of service, 34.6% consisted of auditors who had experienced less than 5 years, 30.8% had 5–10 years, and 21.2% had 11–20 years, and 13.5% were auditors having experience of more than 20 years. On the other hand, management had

more than 10 years' experience consisting of 39.4%, experience 5–10 years at 35.6%, and less than 5 years' experience at 24%. The distribution among the respondents concerning gender showed a high rate of a presence of males (61.5% and 69.2%) for both the internal auditor and management groups, respectively. The age group was distributed with different variations among the respondents. The highest age group of the respondents belonged to mid-aged respondents (36–55 years) at 84.6%, followed by a younger group ranging between 25 and 36 years old at 11.5% of the total respondents. It showed that the auditing process requires people who are energetic and knowledgeable about the variables assessed. Only 3.8% of the respondents were aged more than 56 years old, which added largely to their enormous experience and feedback to the body of this research. In terms of the internal auditors' qualification backgrounds, according to Table 5, most of the respondents were bachelor's degree holders at a total of 64.4% and postgraduates with master's and PhD degrees at a total of 14.4% of the respondents. While only 11.5% had a diploma, 9.6% of the respondents had received their professional certificate. For management's qualifications, the highest respondents were degree holders at 63.5%, followed by postgraduates with master's and PhD degrees at a total of 20.2%. About 8.7% had a diploma and 7.7% had a professional certificate. It can be concluded that internal auditors' and managers' educational backgrounds and experiences allowed them to provide the best and most accurate answers for the study.

### *4.2 Measurement model assessment*

Two statistical software programmes, SmartPLS version 3.0 and SPSS version 22.0, were used to estimate the proposed research framework and respondents' information. SmartPLS through the PLS-SEM was used to assess the measurement and structural model of the study while SPSS was used to analyse the demographic profile of the potential respondents. PLS is one of the most prominent representatives of the SEM technique (Gefen *et al.*, 2000). In this light, PLS was considered as a better option for analysing relationships in contrast to other methods and, particularly, because the conceptual model in this study has been insufficiently grounded by supporting theories.

The assessment of the measurement and structural model results in PLS-SEM draws on a set of nonparametric evaluation criteria. According to Hair *et al.* (2017), the application of these criteria incorporates a two-step process that involves the separate assessment of the measurement and structural models, respectively. Table 2 shows the summarised findings of the measurement items. The findings reveal that the factor loading values for all items exceeded 0.70, which indicates that reliability and validity met the satisfactory level. The lower factor loadings – HRC4 from the construct of human resource capability and AP1 and AP5 from the internal audit process – were dropped for good reliability, convergent validity and discriminant validity. Besides that, their removal leads to an increase in the value of the average variance extracted (AVE) to above 0.50. The indicators with very low outer loadings (below 0.40) should always be eliminated from the construct (Bagozzi *et al.*, 1991; Hair *et al.*, 2017). The findings are shown in Figure 2. For this study, the variance inflation factor (VIF) test was used to detect multicollinearity issues (Petter *et al.*, 2007). A high VIF value indicates the presence of a multicollinearity problem in the structural model. The VIF values in this study were obtained from the analysis, ranging from 1.260 and 2.689. Here, all the values were below 5 and even lower from the stringent threshold of 3.33 (Diamantopoulos and Winklhofer, 2001).

Table 3 shows the findings of the convergent validity. The results obtained from the AVE were deemed satisfactory in terms of the convergent validity of the first-order constructs. All the constructs had the AVE values above 0.50, which means that at the

| Factors and items | Code | FL | VIF |
|---|---|---|---|
| *Human resource capability* | | | |
| My firm. . . . . | | | |
| trusts top management's capability in predicting future market changes | HRC1 | 0.823 | 1.944 |
| conducts continuous training for employees to gain more information about their work | HRC2 | 0.902 | 2.274 |
| enhances the auditor's competency with appropriate education, training, skills and experience | HRC3 | 0.829 | 2.282 |
| neglects the importance of human capital as the key to competitive advantage | HRC5 | 0.840 | 2.163 |
| *Technological capability* | | | |
| My firm. . . . . | | | |
| ensures information systems development such as Enterprise Resource Planning (ERP) and purchasing and supplier management | TC1 | 0.789 | 1.260 |
| uses the most up-to-date technology in conducting an audit | TC2 | 0.776 | 1.907 |
| ignores the updated technology in implementing management systems | TC3 | 0.779 | 1.936 |
| assists all offices through being electronically connected to improve their process | TC4 | 0.739 | 1.566 |
| *Quality capability* | | | |
| My firm. . . . . | | | |
| embarks thoroughly on quality tools such as 5S, Kaizen, just-in-time (JIT) and Total Preventive Maintenance (TPM) | QC1 | 0.791 | 1.730 |
| maintains high reliability and low frequency of breakdown | QC2 | 0.880 | 2.534 |
| focuses on the importance of ensuring a low defect rate for our products | QC3 | 0.899 | 2.669 |
| maintains the good corporate image and high product quality reputation | QC5 | 0.720 | 1.528 |
| *Audit process* | | | |
| Integrated internal audit process in my firm. . . . . | | | |
| ensures the objectives are clear and readily understood by all the personnel taking actions and responsibility for their achievements | AP2 | 0.890 | 2.922 |
| follows appropriate policies and procedures that have been developed | AP3 | 0.885 | 2.689 |
| combines audit team, audit plans and audit documentation for the ease of auditing | AP4 | 0.850 | 2.285 |
| *Audit management effectiveness* | | | |
| My firm's integrated internal audit. . . . . | | | |
| fails to effectively identify and eliminate the non-conformance's points | AME1 | 0.824 | 2.171 |
| decreases non-value-added processes in integrated quality systems | AME2 | 0.850 | 2.303 |
| focuses on the identification of system ineffectiveness, corrective action and ultimately continual improvement | AME3 | 0.808 | 1.837 |
| minimises the resources in implementing integrated quality systems | AME4 | 0.788 | 2.112 |
| is able to anticipate expected quality system breakdowns | AME5 | 0.786 | 2.230 |
| *Business sustainability* | | | |
| During the past three years, my firm achieved a. . . . . | | | |
| significant increase in the general level of revenues | BS1 | 0.739 | 1.893 |
| significant increase in the general level of market shares | BS2 | 0.841 | 2.571 |
| significant improvement in the general level of profitability | BS3 | 0.789 | 2.037 |
| significant improvement in the general level of sales growth | BS4 | 0.756 | 2.429 |
| significant increase in the general level of investment | BS5 | 0.733 | 2.268 |
| significant increase in overall income | BS6 | 0.775 | 1.933 |
| significant improvement in its overall environmental situation | BS7 | 0.740 | 1.852 |

**Table 2.**
Factor loading analysis and VIF

Notes: FL - Factor loading; ERP - Enterprise resource planning; JIT - just-in-time; TPM - total preventive maintenance

minimum level, more than half of the variance could be explained by the indicators for each construct. The findings also indicate that the composite reliability (CR), Cronbach's alpha and rho_A values for all the constructs were above 0.70, which signifies that convergent validity met the satisfactory level (Hair *et al.*, 2017).

Table 4 implies that the discriminant validity test was examined to see the extent to which a construct was truly distinct from the other constructs by empirical standards. Henseler *et al.* (2015) proposed assessing the heterotrait–monotrait (HTMT) ratio of the correlations. The HTMT refers to the mean of all the correlations of the indicators across the

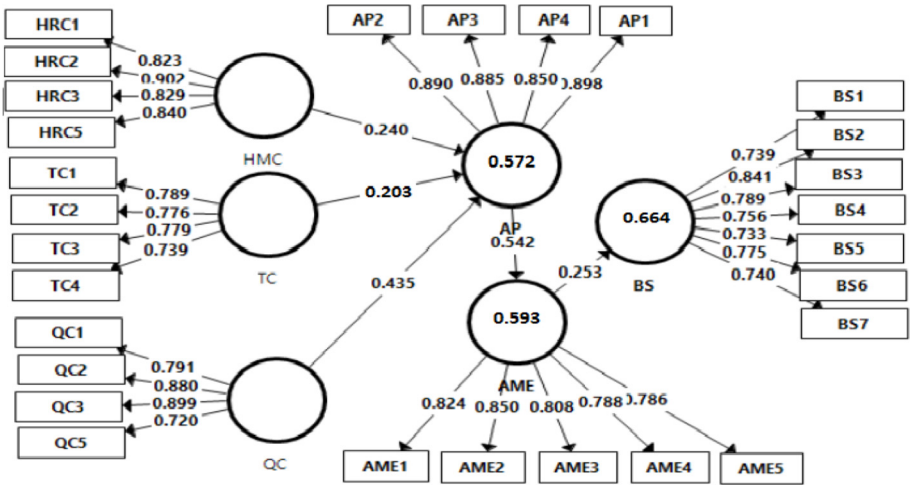


**Figure 2.**
Measurement model

| Constructs | Cronbach's alpha | rho_A | CR | AVE |
|---|---|---|---|---|
| Audit management effectiveness | 0.871 | 0.882 | 0.906 | 0.659 |
| Audit process | 0.904 | 0.907 | 0.933 | 0.776 |
| Business sustainability | 0.885 | 0.896 | 0.910 | 0.590 |
| Human resource capability | 0.870 | 0.871 | 0.912 | 0.721 |
| Quality capability | 0.842 | 0.863 | 0.895 | 0.682 |
| Technological capability | 0.785 | 0.832 | 0.854 | 0.595 |

**Table 3.**
Convergent validity

| | AME | AP | BS | HRC | QC | TC |
|---|---|---|---|---|---|---|
| AME | | | | | | |
| AP | 0.591 | | | | | |
| BS | 0.281 | 0.401 | | | | |
| HRC | 0.649 | 0.560 | 0.133 | | | |
| QC | 0.577 | 0.658 | 0.185 | 0.702 | | |
| TC | 0.448 | 0.299 | 0.212 | 0.476 | 0.480 | |

Note: Audit management effectiveness (AME), audit process (AP), human resource capability (HRC), quality capability (QC), technological capability (TC) and business sustainability (BS)

**Table 4.**
Discriminant validity

constructs measuring different constructs (i.e. the HTMT correlations) relative to the (geometric) mean of the average correlations of the indicators measuring the same construct (Henseler *et al.*, 2015). Technically, the HTMT approach is an estimate of what the true correlation between two constructs would be if they are perfectly measured (i.e. if they were perfectly reliable). If the HTMT ratio is greater than 0.85, there is a matter of discriminant validity (Kline 2011; Gold *et al.*, 2001).

### *4.3 Structural model assessment*

The measurement model was assessed to evaluate the path coefficient, coefficient of determination ($R^2$), effect size ($f^2$), and predictive relevance ($Q^2$). These assessments were conducted to validate the relationships as hypothesised in the research model. The $R^2$ value clarifies the amount of variance in the dependent variables explained by the independent variables. It implies that a larger $R^2$ value increases the predictive ability of the structural model. The $R^2$ value ranges from 0 to 1, with higher levels indicating higher levels of predictive accuracy. According to Hair *et al.* (2011), $R^2$ values of 0.75, 0.50 or 0.25 for endogenous latent variables are, respectively, described as substantial, moderate or weak. In this study, the PLS algorithm function was used to obtain the $R^2$ values which explained the variance of 57.2% of audit process, 59.3% of integrated audit management effectiveness and 66.4% of business sustainability. The bootstrapping function was then used to gain the *t*-statistic values; the recommended sample size of 5,000 was used (Hair *et al.*, 2017). According to Cohen (1988), the guidelines for assessing the $Q^2$ are that values of 0.02, 0.15 and 0.35 represent small, medium and large effects, respectively. $Q^2$ values greater than zero for a certain reflective endogenous latent variable indicate the path model's predictive relevance for the related constructs. Conversely, values of zero and below indicate a lack of predictive relevance (Hair *et al.*, 2017). In this light, all $Q^2$ values were greater than zero, which shows the relevance of the overall model in this study. The goodness-of-fit is also not applicable to the formative measurement model; therefore, research studies are not advised to use this measure (Hair *et al.*, 2011). Table 5 summarises the results of the hypotheses testing for the study. The human resource capability, technological capability and quality capability had positive significant effects on audit process whereas *H1*, *H2* and *H3* were accepted. The findings also reveal that internal audit process had a highly significant impact on integrated audit management effectiveness and, in turn, it also had a significant

| Hypothesis | Relationships | Beta | SD | *t*-value | $f^2$ | $Q^2$ | $R^2$ | Decision |
|---|---|---|---|---|---|---|---|---|
| *H1* | HRC -> AP | 0.240 | 0.098 | 2.448 | 0.057 | 0.258 | 0.572 | Accepted |
| *H2* | TC -> AP | 0.203 | 0.084 | 2.416 | 0.065 | | | Accepted |
| *H3* | QC -> AP | 0.435 | 0.130 | 3.356 | 0.185 | | | Accepted |
| *H4* | AP -> AME | 0.542 | 0.068 | 8.023 | 0.415 | 0.173 | 0.593 | Accepted |
| *H5* | AME -> BS | 0.253 | 0.091 | 2.777 | 0.068 | 0.028 | 0.664 | Accepted |

*Mediating effect*

| Hypothesis | Relationship | Beta | SD | *t*-value | *p*-value | Decision |
|---|---|---|---|---|---|---|
| *H6a* | HRC -> AP -> AME | 0.137 | 0.056 | 2.430 | 0.015 | Mediation effect |
| *H6b* | TC -> AP -> AME | 0.001 | 0.046 | 0.032 | 0.974 | No mediation effect |
| *H6c* | QC -> AP -> AME | 0.236 | 0.081 | 2.909 | 0.004 | Mediation effect |

**Table 5.**
Path coefficient

**Note:** Audit management effectiveness (AME), audit process (AP), human resource capability (HRC), quality capability (QC), technological capability (TC) and business sustainability (BS). Significant at $^{**}p < 0.01$ and $^{*}p < 0.05$ (*t*-values: 2.326 and 1.645)

and positive impact on business sustainability, therefore, *H4* and *H5* were accepted. The results are shown in Figure 3.

The mediation testing was carried out based on Preacher and Hayes' (2008) method of bootstrapping. In this light, the *t*-values should have been significant and the bias-corrected confidence interval on the lower and upper level should not have straddled between 0. If this was not satisfied, it meant there was no mediation effect and vice versa. Table 5 presents the result of the mediation analysis of the internal audit process. In assessing the mediator role of the internal audit process, it was observed that the indirect effect was significant at *p*-value 0.05 between human resource capability ($\beta = 0.137$, $t = 2.430$) and audit management effectiveness and quality capability ($\beta = 0.236$, $t = 2.909$) and audit management effectiveness. The result indicated that the audit process did not mediate the relationship between technological capability ($\beta = 0.001$, $t = 0.032$) and human resource capability; therefore, *H6a* and *H6c* were supported but *H6b* was not significant as there was no indirect effect between quality capability and audit management effectiveness.

## 5. Importance performance matrix

The importance–performance matrix (IPM) can be used for the robustness of the results (Ringle and Sarstedt, 2016). The IPM highlights the development of the target construct. In this study, the target construct was business sustainability. The findings reveal that IPM achieved the total effects of the relationship with the other constructs (e.g. human resource capability, technological capability, quality capability, audit process and audit management effectiveness) on the target construct of business sustainability. The data used for the IPM of business sustainability as a latent construct is presented in Table 6. The results reveal that quality capability (70.776) was the most crucial dimension in predicting business sustainability in the manufacturing firms which would lead to the emerging economy because it was reflected by high importance and performance values. Besides that, the result shows that human resource capability (62.093), technology capability (60.903), audit process (60.659) and audit management effectiveness (48.869) were also important components for business sustainability. Figure 4 illustrates the

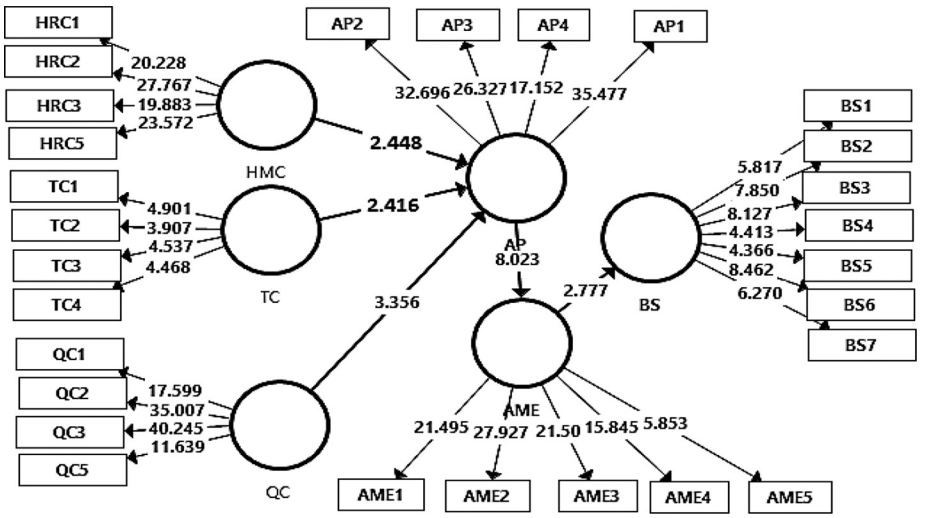


**Figure 3.**
Structural model

importance–performance map and enlightens the results of business sustainability as a target factor.

## 6. Discussion

The study has been aimed to determine the extent of the relationships between the internal capabilities (which consist of human resource capability, technological capability and quality capability) and integrated audit management effectiveness, which, in turn, reflect the business sustainability of Malaysian manufacturing firms for an emerging economy. The results of this study show that the internal capabilities identified are good predictors of the internal audit process. Human resource capability is valuable for a company where everyone, including the management staff, auditors and auditees, plays a significant role in the IMS. The presence of quality auditors could significantly increase the ability to identify conformity, and as a result, increase the value of the management system (Kaziliūnas, 2008). Referring to the above findings, the tested structural model provides evidence that human resource capacity is statistically significant in influencing the internal audit process ($\beta$ = 0.340, $p < 0.01$). The $p$-value of the variable was 0.01, indicating that the variable has a significant influence on the internal audit process. The findings also reveal that the HTMT ratio of the correlations among the factors, such as audit management effectiveness, audit process, human resource capability, quality capability, technological capability and business sustainability, were less than 0.85 (Gold *et al.*, 2001), which indicates that this study achieved the discriminant validity.

**Table 6.** Performance and total effects

| Constructs | Total effects | Performances |
|---|---|---|
| Audit management effectiveness | 0.289 | 48.869 |
| Audit process | 0.141 | 60.659 |
| Human resource capability | 0.038 | 62.093 |
| Quality capability | 0.071 | 70.776 |
| Technological capability | 0.000 | 60.903 |

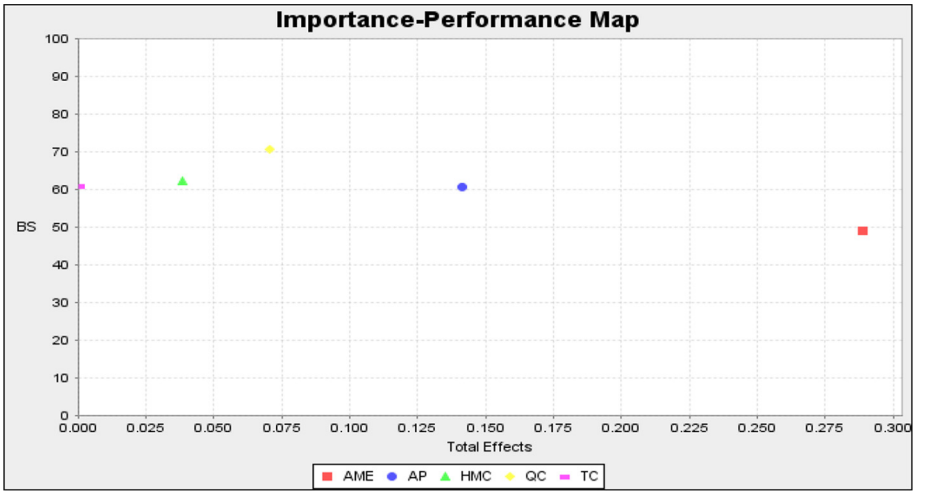


**Figure 4.** Importance–performance map

The previous studies have discussed the importance of technological capabilities in the internal audit process (Venkatesh, 2006). This study has also found that technological capability has a significant impact on the internal audit process ($\beta = 0.203$, $p < 0.01$) in Malaysian manufacturing firms. Past scholars have also argued that businesses should implement an approach which integrates business processes and execute them as a single business/IT audit rather than adopting a segregated approach where business and IT audits are performed separately (Chaney and Kim, 2007). However, Zutshi and Sohal (2005) suggested that the use of technology to implement and retain an audit system requires highly skilled employees who are empowered to change the traditional segregated system. In light of this finding, it should be noted that most previous studies did not analyse the impact of organisational and environmental factors on technology adoption and the impact of technology adoption on performance (Migdadi *et al.*, 2016).

The quality management tool can be adopted to enhance operational processes (Muthusamy *et al.*, 2017). It was further described that integrated audits and reviews have several benefits, including optimising operations, allowing integrated work instructions, streamlining records, checklists and data collection, and increasing compatibility with MSSs. This study's finding has shown that quality capability positively and significantly impacted the internal audit process ($\beta = 0.435$, $p < 0.01$). The quality capability refers to a company's achievement of various quality dimensions. Past studies have found that quality capabilities and business strategy compatibility are crucial to improving a firm's performance (Kumar *et al.*, 2020). The results also reveal that the internal audit process had a significant influence on the integrated audit management effectiveness ($\beta = 0.542$, $p < 0.01$) and, in turn, it had a positive impact on business sustainability ($\beta = 0.253$, $p < 0.01$) in the manufacturing firms in Malaysia.

This study has generated three hypotheses on the mediating effect of the internal audit process on the relationship between internal capabilities and integrated audit management effectiveness in Malaysian manufacturing firms. The result shows that the internal audit process has a significant partial mediating effect on the relationship between human resource capability, technological capability and integrated audit management effectiveness. It implies that the internal audit process is the crucial component in the manufacturing firms for evolving the economy and emerging market.

## 7. Theoretical and managerial implications

The study is expected to contribute fruitful insights on the DCT and existing literature pertinent to the internal audit capability factors along the internal audit process and the effectiveness of integrated audit management which leads to the desired outcome of business sustainability in the Malaysian manufacturing industry for an emerging economy. The potential contributions of this study can be viewed from two aspects, theory and practical, in examining the relationship between the internal capabilities (human resources capability, technological capability and quality capability) and integrated audit management effectiveness. This study's findings provide new insights into the DCT and the link between the internal capability factors and the effectiveness of integrated audit management, which is the desired outcome. The technological capability in this context also has a significant link with the effectiveness of integrated audit management. The reason for this finding is that most of the manufacturing firms have used technology innovation. Although Malaysian firms have low technological capabilities and do not use online reporting as part of their auditing process, it has a significant practical impact on the internal audit process for business sustainability and the evolving economy. This study has considered that unlike a firm's business strategy, integrated audit management

effectiveness can help to improve a firm's performance. Quality management is a crucial factor for the integral business strategy to improve business performance. The capabilities can be developed within various dimensions and the capabilities should be aligned with business strategy to contribute to the improvement of business performance.

The existing study contributes to the manufacturing industry players with insights into the internal capability factors that influence the internal audit process along with integrated audit management effectiveness and, in turn, the outcome of business sustainability. The findings suggest that the interrelationships among human resource capability, technological capability and quality capability are important to enhance the internal audit process in achieving integrated audit management effectiveness towards business sustainability for an emerging economy. Concerning the human resource capability, skills, knowledge and experience have to be accounted for during the auditing to shape the integrated audit management effectiveness. For example, internal auditors are responsible for providing details and clear audit reports to their management during the closing meeting. With the appropriate skills, knowledge and experience, the audit findings can be used by firms' management to further improve their performances. This indicates that before the auditing process, auditors need to have the appropriate capabilities so that they can execute an effective auditing process. In this regard, human resource capability, technological capability and quality capability are considered as the main factors that could influence integrated audit management implementation. These capabilities, comprising the skills, knowledge and experience of human resources, have become ever-increasingly important, not only for implementation but also for the improvement of audit management effectiveness. This study can guide manufacturing firms that implement integrated audit management effectiveness by strongly emphasising the concepts of human resource capabilities and quality capabilities. This study found that most of the respondents had focused on quality capability. Consequently, this study has shown the importance for firms to implement other quality initiatives such as integrated audit management effectiveness. It can be argued that quality capability allows for employees' active participation in its daily operations and cultivating a proactive work culture focusing on risk prevention, workplace safety and reducing workplace accidents, which subsequently, could increase employees' work motivation. The human resource, technology and quality capabilities could increase the effectiveness of integrated audit management effectiveness to enhance business sustainability performance. This study's findings can benefit different parties, including manufacturing firms implementing internal audit processes, integrated audit management, industry players and practitioners such as internal auditors and managers, to develop comprehensive frameworks to improve the effectiveness of their integrated audit management systems. This study's findings could help a firm's top management and auditors to prepare and plan an effective integrated audit management approach that could lead to business sustainability for emerging economies and markets.

## 8. Limitation and future study

The study is limited to manufacturing firms that had received certification. Past studies on IMS have derived data on integrated audit management effectiveness from the manufacturing and service industry. The result of this research might only apply to manufacture firms in Malaysia and may not be generalised for other firms in different industries and other regions. Future researchers can also replicate this study in other countries within the Southeast-Asia region, particularly those that have a similar business environment and market climate. The result can be compared to see whether the study's findings differ when a different policy and regulatory criteria are being enforced. Using this model in a different location within the region will help increase the model's generalisability to a wider population. Future researchers can conduct alternative analyses to verify the robustness of this study's findings. As PLS analysis, a variance-based approach was used in

this study; future studies can use the covariance-based approach and compare the results to determine whether the use of different analysis approaches will influence the outcome.

The study has explored the relationship between internal capabilities factors and internal audit processes as well as the aspects of the implementation of integrated audit management effectiveness for business sustainability. The study also investigated the mediating role of the internal audit process in the relationship between the internal capability factors and integrated audit management effectiveness in the context of Malaysian manufacturing firms. The conceptual model was designed and operationalised based on recent theories and models. This study has highlighted the important role played by human resource capability, technological capability and quality capability in influencing the internal audit process and its impact on audit management effectiveness. In some points, the findings challenge the theoretical assumptions that the internal audit process has limited influence in integrated audit management effectiveness. Thus, it can be concluded that quality and audit process efficiency are the important indicators of integrated audit management effectiveness. This study has significantly shown that the internal audit process strongly mediates the relationship between internal factors and audit management effectiveness in the Malaysian manufacturing firms. Inputs from this study will provide fruitful insights to help manufacturing firms devise effective integrated internal audit management systems to ensure business sustainability and increase competitiveness advantages for an emerging economy.

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