





Antecedents and Outcomes of Integrated Internal Audit Management (IIAM) Effectiveness in Certified Malaysian Manufacturing Firms

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Chapter 1: Introduction

Karapetrovic & Willborn (1998b)

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Integrated Management System (IMS) as the interconnected processes with shared human, information, material, infrastructure, and financial resources that are executed to fulfil goals to satisfy different stakeholders.

Rajendran and Devadasan (2005)

The importance of adopting an **integrated auditing standard** into Occupational Safety & Health Management Systems (OHSAS), Quality Management System (QMS) & Environmental Management System (EMS).

Abad et al. (2014), Oliveira et al. (2013)

IMS audits or integrated internal audit management (IIAM) present more effective management system that save time, reduce bureaucracy and enable the more efficient adopted of human, technical and financial resources.

Kymal (2015)

Standards are expensive to implement and maintain where the cost of implementation will take around \$50,000 to \$70,000 per standard meanwhile, its maintenance will cost around \$30,000 - \$35,000 per standard

\$35,000 per standard. Seidel (2011)

Manufacturing companies have started to consider sustainable manufacturing practices in address social and economic issues in Asia-pacific region.

Hernandez, 2010

An audit process examines the level of risk involved, the response level, and the maturity which reflects how an organisation could respond to customers' demand.

Kraus and Grosskopf (2008)

Internal: some quality practitioners are not familiar with management system standards to allow them to perform integrated audits that led to poor audit methods and practices.



Problem Statement

Salomone (2008); Zutshi & Sohal (2005)

78% of study integrates their internal audits, while this 65% in the case of external audits. Internal audit effectiveness can be seen through the coverage audit area, auditor capabilities and audit frequency.

Searcy et al. (2012); Luttropp & Lagerstedt, (2006); Maxwell & Van der Vorst (2003)

The integration of **sustainability** and **IMS** approach is inadequate. **Not much studies** to adapt current MSs practices and tools to better align with **business sustainability**



Karapetrovic & Willborn, 2001; Bernardo et al., 2011; Simon et al., 2011; Bacoup, Michel, Georges & Magalus, 2015; Psomas & Antony, 2015

There are many studies about MS audits. However, studies about audit integration (internal and external) are much sparse and contributions in this direction are very much needed Mohammad et al. (2004)

In Malaysian context, critical success factors of IMS (IIAM) are consist of internal and external factors. However, these factors are not related to any theories that govern the whole IMS initiatives.

Research Questions and Objectives

What is the relationship between antecedent factors and IIAM effectiveness in Malaysian manufacturing firms?

What is the relationship between internal audit process and IIAM effectiveness?

Does Integrated IIAM effectiveness affects business sustainability performance in Malaysian manufacturing firms?

What is the relationship between antecedent factors and internal audit process in Malaysian manufacturing firms?

What is the mediating role of internal audit process on the relationship between antecedent factors and IIAM effectiveness?



To examine the relationship between antecedent factors and IIAM effectiveness in Malaysian manufacturing firms.

 To identify the relationship between internal audit process
 and IIAM effectiveness.

To examine the relationship between the IIAM effectiveness and business sustainability in ^{*}Malaysian manufacturing firms.

To determine the relationship between antecedent factors and internal audit process.

To investigate the mediating role of the internal audit process in the relationship between antecedent factors and IIAM effectiveness in Malaysian manufacturing firms.



Chapter 2: Literature Review

Antecedent Factors

Newbert, 2007

Resources such as technology, human resource, quality, innovation, cost reduction and knowledge capabilities are controlled by a firm.

Internal

Rebelo et al. 2014

Investment of resources and expertise to respond effectively to the involved standards and applicable requirements in the planning phase of the IMS.

Internal

Delmas, 2001

External stakeholder involvement (customers/ shareholders, regulator etc) have a strong and positive impact in pursuing business sustainability.

Asif et al., 2010

The integration further enhanced coordination with external stakeholders.

External

External



Content Analysis (Antecedent Factors)

No.	Auth	iors	Year	Human resourc es	Technol ogy	TQM/ Quality Tools	Material/ Resourc es	Culture	Time	Manage ment Support	Financia I	Firm structur e
1	Burban		2018	a		J				a		
2	Michael et al		2010	1		1				,		
3	Bernardo et al.		2017	v	V				V	V		
4	Muzaimi et al		2017	V			V	\checkmark	V			V
5	Domingues et al.		2016	V	V							X
6	Rebelo et al.		2016	V	V			V		V	V	V
7	Nunhes et al.		2016	V	V				V		X	
8	Bernardo et al.		2015	V					V		V	
9	Hoy and Foley		0045		.1		.1					
10	Savino and Batbaatar						_	V				
11	Kauppila et al.	- In	ternal t	act	ors							
12	Ahsen, Anette von											
13	Chee Yew et al.	1			~							
14	Simon et al.		Human	res	our	ce			V			
15	Mohamad et al.							V		V		
16	Abad et al.	2	Tachna	loav	,							V
17	Domingues et al.	<u> </u>		iuyy						V	V	
18	Rebelo et al.	_		•••				V				V
19	Simon et al.	3	()uality	can	ahi	litie	S		\checkmark			
20	Sampaio et al.	0.	Quanty	oup	un	nuo	U _	V			V	V
21	Simon et al.							V	\checkmark	V		
22	Simon and Yaya		2012	V				V				
23	Simon et al.		2011	V					V			
24	Bernardo et al		2011	V			V		V			
25	Asif et al.		2011	N	V		٧			٧	V	
26	Zeng et al.		2011	V				V			V	٧
27	Asif et al.		2010	V	V	V			V			
28	Tari and Molina		2010	1	N	N	N			N		
29	Bernardo et al.		2009	N	N	N	٦				N	
30	Salomone, Roberta		2008	N		N		N	N		N	
31	Rasinussen, Jivi Mohammad at al		2007	v	v	1	al	v		2		V
22	largoncon ot al		2007			N N	N	al	al	* 2		
30	Zutebi and Sobal		2006		N	N		N N	N	N N		
35	Ramber et al		2005		N N	N		v		v		
36	Sroufe Robert		2004		1	v						
37	Beckmerhagen et al		2003	2	v							
0.	Sookinemagen et al.	Total	2000	28	, 18	16	14	13	12	11	9	8
				20	10	10	- IT	10	14		0	0

These factors were validated by industry during prelim study

No.	Authors	Year	Custome r	Stakehol der	Supplier	Regulato rs	Employe es	Manage ment	Commu nity	Distribut or	Banks/ Trade	Competi Cor tor or	ntract Market
1	Burhan	2018				V							V
2	Michael et al.	2017	V		V	V							
3	Bernardo et al.	2017	V	V		V							
4	Muzaimi et al	2017	V	V									
5	Domingues et al.	2016	V	V	V		V						
6	Rebelo et al.	2016	V		V	V			V	V	V	V	
7	Nunhes et al.	2016	V			V							
8	Bernard	0015		1									
9	Hoy and	tarnal	faa	tor	~ 1								
10	Savino : CX	lemai	lac	ιΟΓ	S.		N						
11	Kauppila	•				_							1
12	Ahsen, /	Custon	ners										
13	Wong e					_		V					
14	Sampai 🤈	Supplic	re			_							
15	Simon e 🖊 🛛	Supplie	515										
16	Mohama	– · ·											
17	Abad et	Regula	tors					V					
18	Doming ••	itoguia	1010			_	V		V				
19	Rebelo												
20	Simon et al.	2013	N	N			٦						
21	Simon et al.	2012		N									
22	Simon and Yaya	2012	N	N			N						
23	Simon et al.	2011		2									
25	Asif et al	2011	V	,	N	J	J		2				
26	Zeng et al	2011	1	V		1			1				
27	Asif et al.	2010	√		V	, V							
28	Tarí and Molina	2010	V	V				V					
29	Casadesus et al.	2009		V									
30	Salomone, Roberta	2008	V		V				V				
31	Rasmussen	2007	V		V			V					
32	Mohammad et al.	2007		V				V					
33	Jørgensen et al.	2006	N		V		N		V				
34	Zutshi and Sohal	2005	V	V	V	V	V		V				
35	Bamber et al.	2004	\checkmark	V	V	\checkmark		V					
36	Sroufe, Robert	2003		V									
37	Beckmerhagen et al.	2003		Ń				\checkmark					
	Total		26	24	15	14	9	7	7	1	1	1	1 1

Audit Process and Outcomes

Gryna, Chua and DeFeo (2007)



The audit process could be defined as planning, conducting, report writing and following up any corrective or improvement action required.

Dittenhofer, (2001)



The outcomes of internal audit process can lead to the effectiveness of internal control system in the organisation.

Michael et al., (2017)



QMS, EMS and OHSAS have been integrated to maximise the firm's performance and effectiveness.



Salamone (2008); Zutshi and Sohal (2005)

Portray the good image of companies, bring values to the business such as costs savings, operational benefits, improved customer satisfaction and enhanced employee motivation.

Content Analysis (Outcome)

No.	Authors	Year	SD/ BS	IMS Benefits	Improv ement	Effectiv eness	BP	OP	Assess ment	CS	FP/ BSC	Innovati on	TQM
1	Burhan	2018	\checkmark										
2	Michael et al.	2017					V						
3	Bernardo et al.	2017	\checkmark										
4	Muzaimi et al	2017		V				V					
5	Domingues et al.	2016							\checkmark				
6	Rebelo et al.	2016	\checkmark										
7	Nunhes et al.	2016	\checkmark										
8	Bernardo et al.	2015	\checkmark				\checkmark						
9	Hoy and Foley	2015				\checkmark							
10	Savino and Batbaatar	2015				\checkmark		\checkmark					
11	Kauppila et al.	2015					V						
12	Ahsen, Anette von	2014	\checkmark								\checkmark		
13	Wong et al.	2014											
14	Sampaio et al.	0044							V				
15	Simon et al.	0											
16	Mohamad et al.		:011	ie:									
17	Abad et al.												
18	Domingues et al.	Rusir	1000	S SII	sta	inal	nilitu	V					
19	Rebelo et al.	Duon	1000	00	olu	ma	Junc'	y					
20	Simon et al.	2013		N									
21	Simon et al.	2012											
22	Simon and Yaya	2012				\checkmark						V	
23	Simon et al.	2011			V								
24	Bernardo et al.	2011			\checkmark								
25	Asif et al.	2011											
26	Zeng et al.	2011		\checkmark									
27	Asif et al.	2010				V				\checkmark			
28	Tarí and Molina	2010			V								
29	Casadesus et al.	2009		N									
30	Salomone, Roberta	2008	V	V									
31	Rasmussen	2007					\checkmark						
32	Mohammad et al.	2007		\checkmark									
33	Jørgensen et al.	2006	\checkmark										
34	Zutshi and Sohal	2005		\checkmark									
35	Bamber et al.	2004			\checkmark								
36	Sroufe, Robert	2003											
37	Beckmerhagen et al.	2003	\bigcirc			V							
	Total		13	10	7	6	5	4	3	1	1	1	1

Elkington, 1994; Asif et al., 2010 The expansion of the corporate perspective which considers environmental, social and economic aspects.





Dynamic capability

- Arises from a resource-based view (RBV) (Barney, 1991) where resources are seen as "stocks that are owned or controlled by the firm" (Amit & Schoemaker, 2012).
- DCT allows firms to integrate,
 build, and reconfigure their
 capabilities and resources (Teece et al., 1997),
- The DCT has been found to be more appropriate in explaining the performance of firms than the RBV, something that is reflected in recent meta-analyses of past empirical studies (Fainshmidt et al., 2016).

Theories



Stakeholder

- Stakeholder theory concerns how firms should strategically respond to stakeholder demands that are critical for the company's success (sustainability) (Freeman, 1984; Henriques & Sadorsky, 1999; Sharma and Henriques, 2005).
- Stakeholder pressure may take the form of legal requirements, command of limited resources, and so on (Liu & Anbumozhi, 2009).
- Relationship management with principal stakeholders is a key strategic factor (Delmas & Montiel, 2008).



Contingency

- Integrated internal audit can be considered as one of the **business strategy** that can lead to operational **performance** improvement (Asif et.al, 2010).
- No specific way to manage the organisation because it is contingent upon several factors; internal or external factors (Fiedler, 1965).
- According to Savino and Batbaatar (2015), integrated audit strategy is considered as a core resource for Small and Medium Enterprises (SMEs).

Initial Framework

Antecedents and Outcomes of Integrated Internal Audit Management Effectiveness in Certified Malaysian Manufacturing Industry





Chapter 3: Validation of theoretical framework

Interview on IIAM



D

Validity and Relia	ability Measures	Ast.		Findings	of Interview
Validity/ Reliability	Measures				
Internal validity	 Specification of a clear research framework Inferences and pattern matching in relation to prior research Triangulation of analysed data and discussion 	Finding 1	Finding 2	Finding 3	Finding 4
	 the case analysis Explanation of rational for the case selection 	+ ÷ × =	*		P
	 Detailed case background information 	All firms agree that the internal factors	5S and TQM tools used to sustain the	All firms agree that external	integrated internal audit has identified
Reliability	 Establishing interview protocol Comparable questionnaire items 	influence the IIAM effectiveness	IMS implementation	factors as a push factors and motivation.	as an initiative to improve business sustainability

Adapted from Schneider et al., 2014

Research Framework

Antecedents and Outcomes of Integrated Internal Audit Management Effectiveness in Certified Malaysian Manufacturing Industry



Hypotheses





Hypotheses



1 H5a-e Ö

The internal audit process mediates the relationship between human resource capability and IIAM effectiveness.

The internal audit process mediates the relationship between technological capability and IIAM effectiveness.

The **internal audit** process **mediates** the relationship between **quality capability** and **IIAM effectiveness.**

The internal audit process mediates the relationship between regulators and IIAM effectiveness.

The **internal audit** process **mediates** the relationship between **customers suppliers** and **IIAM effectiveness**.



Chapter 4: **Research Methodology**

Quantitative Research





Instrument of internal factors

Instrument of Internal Audit Process and Outcomes

Internal audit process comprises of the PDCA cycle with four steps, respectively Plan, Do, Check, Act. This cycle will result in five steps - policy, planning, implementation and operation, corrective action and management review (Rasmussen, 2007)

02

According to Feng, Terziovski and Samson (2007), the main outcomes are associated with **IMS effectiveness (IIAM)** which consist of quality, productivity and efficiency.

03

From the **business** perspective, **sustainability** encompasses economic, environmental and social issues that have business implications (Asif et.al, 2010).



Face Validity

Expert	Field
Assoc. Prof. of UUM	Accounting and Auditing
Dr. of UiTM	Accounting and Auditing
Adjunct Prof. of UNIMAS	Quality Improvement and Operation

Academic Feedback

The questionnaire to be simplified as **lengthy** questions may lead to **low response rate.**



Expert	Field
MPC Associate Consultant (UniTHO)	IMS (Operation)
MPC Associate Consultant (Lead Auditor)	MSs, ISO 9001, ISO 14001 and ISO 18001
MPC Associate Consultant	Process Improvement

Industry Feedback

To check whether there were any **missing points** in the questionnaire structure, wording, flow and others.

No. of questionnaire's items

Measurements	Items	
HRC	9	
тс	9	
QC	6	Profile/
RE	6	o-
CS	7	27
IAP	10	Total items:
QE	10	123
PE	7	
EE	7	
BS	25	
96		

Conducting Pilot Study No. of pilot study: 13 Duration: 1 month Medium: Online

Justification

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Isaac and Michael (1995) suggested that "samples with N's between **10 and 30** have many **practical advantages**" including simplicity, easy calculation, and the ability to test hypotheses".

Fink (2003), as cited in Saunders (2007) who stated that the **minimum** number for a pilot study is **10**

Pilot Study

Variable	Items	Cronbach's Alpha	Remark
Audit process	10	.881	High
Human resource capability	9	.911	Excellent
Technology capability	9	.916	Excellent
Quality capability	6	.925	Excellent
Regulator	6	.853	High
Customer and Supplier	7	.917	Excellent
Quality effectiveness	10	.931	Excellent
Productivity effectiveness	7	.965	Excellent
Efficiency effectiveness	7	.904	Excellent
Cost reductions	8	.952	Excellent
Benefits	7	.985	Excellent
Business sustainability	21	.961	Excellent

Reliability Test Results

Population/ Sample Size





Chapter 5: Analysis and Findings

Response Rate

Characteristic	Sample size/ Response rate	
Total questionnaires sent to respondents	439	RF
G*Power with 80% (sample size recommended)	92	
Questionnaires received from respondents (online)	133	DA
Questionnaires received from respondents (manual)	39	
Total questionnaires received from respondents	172	The
Unusable questionnaires	-	The s
Usable completed questionnaires (IA and Manager)	104	can b
Partially complete questionnaires (either IA or Manager)	68	respo
Overall response rate	39.2%	

23.7%

ESPONSE TE

study response rate of 18.61% be considered as an effective onse rate in ISO integration audit (Abad et al., 2014).

DATA **CLEANING**



SPSS differentiates between outliers (observations indicated by the circles and extreme values indicated by asterisks (Sarstedt & Mooi, 2014).

The statistical results depict some influential observation but no outliers.

23.7%

Usable response rate

Response Rate



number of **missing** values per observation does not have to exceed 15%.

Hair et al. (2017), the

Missing values	Treatments
Less than 5%	Mean value replacement instead of case-wise deletion

Demographic Profile Multiple Respondents

Firm Profile









Conduct IA



37 responses 67 responses



The independent t-test result shows **no significant difference**

between the two groups for thirteen organisations and respondents characteristics.

Non Response Bias

SPSS Independent t-test



39 responses 65 responses



The independent t-test result shows no significant differences except on length of business, methods in conducting IA and management positions due to the ability of companies and their people in implementing IIAM into their daily operation.

Descriptive Analysis

Descriptive analysis of antecedents of

IIAM effectiveness

	Ν	Mean	Std.
			Deviation
Human resource	104	4.01	.503
capability			
Technological	104	3.57	.475
capability			
Quality capability	104	4.12	.537
Regulator	104	3.91	.524
Customer-Supplier	104	4.23	.521

Note: All variables use a 5-point Likert scale

Descriptive analysis of internal audit process of IIAM effectiveness

	N	Mean	Std.
			Deviation
Audit process	104	3.89	.545



Descriptive analysis of the IIAM effectiveness

	Ν	Mean	Std.
			Deviation
Quality	104	3.76	.494
Productivity	104	3.82	.563
Efficiency	104	4.00	.610

Descriptive analysis of the IIAM effectiveness outcomes

	Ν	Mean	Std.
			Deviation
Business	104	3.62	.533
sustainability			



1. Assessment of <u>reflective</u> measurements for <u>first-order</u> constructs



First order measurement model

Hair et al., (2017) stated that indicators with the **loading below 0.50** should be considered for **removal.** HR4, TC2, TC3, TC5, TC8, QC4, QC6, SR2, SR3, CS1, CS5, AP6, QU1, QU2, QU4, QU8, QU9, QU10, PR4, PR7, BS6, BS22, BS23 and BS24

Reliability between 0.70 and 0.90 (satisfactory); value between 0.60 to 0.70 (acceptable)

HR6, TC1, TC4, EF1, BS4, BS12 and BS17 have loading ranged between 0.511 and 0.695. However, these are **retained** in the measurement model as their removal did not add value to either **AVE or CR**.

2. Assessment of <u>reflective</u> measurements for <u>second-order</u> constructs

Construct	Items	Loading	CR	AVE
Human resource capability	HR1	0.705	0.902	0.538
	HR2	0.805		
	HR3	0.772		
	HR5	0.785		
	HR6	0.510		
	HR7	0.765		
	HR8	0.769		
	HR9	0.712		
Technology capability	TC1	0.665	0.845	0.523
	TC4	0.696		
	TC6	0.777		
	TC7	0.735		
	TC9	0.737		
Quality capability	OC1	0.779	0.895	0.682
	ÕC2	0.875		
	ÕC3	0.898		
	ÕC5	0.740		
Regulator	SR1	0.849	0.872	0.633
5	SR4	0.865		
	SR5	0.715		
	SR6	0.742		
Customer Supplier	CS2	0.735	0.900	0.643
	CS3	0.806		
	CS4	0.858		
	CS6	0.812		
	CS7	0.794		
Audit process	AP1	0.879	0.944	0.678
	AP2	0.855		
	AP3	0.817		
	AP4	0.808		
	AP5	0.888		
	AP7	0.776		
	AP8	0.842		
	AP9	0.709		

Heterotrait-Monotrait (HTMT)

First Order

	1	2	3	4	5	6	7	8	9	10
1. Antecedents		· · · · · · · · · · · · · · · · · · ·	-			-			-	
2. Antecedents	0.672									
3. Antecedents	0.871	0.700								
4. Audit Process	0.706	0.547	0.632							
5. Quality	0.677	0.436	0.624	0.733						
6. Productivity	0.571	0.563	0.592	0.600	0.896					
7. Efficiency	0.636	0.532	0.583	0.717	0.746	0.816				
8. Economy	0.096	0.144	0.136	0.320	0.267	0.330	0.336			
9. Environment	0.204	0.169	0.251	0.428	0.296	0.345	0.300	0.834		
10. Social	0.140	0.131	0.111	0.204	0.148	0.155	0.159	0.691	0 825	

TC

SR

CS

AP

All the values passed the HTMT.90 (Gold et al., 2001), the HTMT.85 (Kline, 2011) and also the HTMT_{Inference} also showed that the confidence interval did not show a value of 1 in any of the constructs thus indicating that discriminant validity has been ascertained.



Smart - C

3. Assessment of <u>formative</u> measurements for <u>second-order</u> constructs



Formative indicator should generally be **retained** when an **item weight** is **not significant** but has a relatively **high item loading** (i.e., > 0.5). However, social item also been retained as Asif et al., (2011) and Qi et al. (2013) highlighted that business sustainability encompasses economic, environmental and social aspects.



Path Coefficient and Hypotheses Testing

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Independe nt construct	Dependent construct	Path Coefficient	T Statistics	P Values	
HRC	IIAM effectiveness	0.242	2.530	0.006	
ТС	$R^2 = 0.496$	0.003	0.053	0.479	
QC		0.234	2.226	0.013	
SR					
CS					
		0.083	1.300	0.097	
Audit Process	IIAM effectiveness (IIAME) R ² =0.142	0.729	13.752	0.000	
HRC	Audit process	0.332	2.657	0.004	
ТС	(AP)	0.004	0.053	0.479	
QC	R ² = 0.496	0.321	2.323	0.010	
SR		0.114	1.326	0.093	
CS	·	0.041	0.372	0.355	
IIAM Effectivene ss	Business sustainability (BS) R ² =0.531	0.376	4.284	0.000	

	Hypothesis Statem	nent	Result
H1a	Human resource	capabilities	Supported
	positively influence	the IIAM	
	effectiveness.		
H1b	Technological	capabilities	Not
	positively influence	the IIAM	Supported
	effectiveness.		
H1c	Quality capabilities	positively	Supported
	influence the IIAM effe	ectiveness.	
H1d	Regulators positively	y influence	Not
	the IIAM effectiveness	6.	Supported
H1e	Customers and suppli	er positively	Not
	influence the IIAM effe	ectiveness.	Supported
H2	Internal audit proces	s positively	Supported
	influences the IIAM ef	fectiveness	
112		nositivolv	Currented
H	naw enectiveness	positively	Supported
	influences the	business	
	sustainability		

Mediation and Effect Size

Luni	Maria	n İ.ı	Lol		JAN.		بالمعاربيان	Mali	والمع
Relationship	Sample Mean (M)	Standar d Deviatio n	T Statistics	P Values	Bootstr Confidenc 95%LL	apped e Interval 95%UL		III.	Internal Audit Pro
		(STDEV)							f ² Effe
HRC -> AP -> IIAM	0.242	0.096	2.530	0.006	0.080	0.397		HRC	0.091 Small
TC -> AP -> IIAM	0.019	0.059	0.053	0.479	-0.074	0.117			
QC -> AP -> IIAM	0.238	0.105	2.226	0.013	0.072	0.417	annandan .	TC	0.000 None
SR -> AP -> IIAM	0.088	0.064	1.300	0.097	-0.013	0.198	ETIBOLE	QC	0.080 Small
CS -> AP -> IIAM	0.022	0.081	0.370	0.356	-0.120	0.149	Sinters	SR	0.015 None
							24		



IIAM

Business

Internal Audit Process



Hypotheses Decision

		No	Hypotheses	P-value	Decision
		H1a	Human resource capabilities positively influence the IIAM effectiveness.	0.017	Supported
		H1b	Technological capabilities positively influence the IIAM effectiveness.	0.479	Not Supported
		H1c	Quality capabilities positively influence the IIAM effectiveness.	0.013	Supported
		H1d	Regulators positively influence the IIAM effectiveness.	0.097	Not Supported
		H1e	Customers and supplier positively influence the IIAM effectiveness.	0.356	Not Supported
		H2	Internal audit process positively influences the IIAM effectiveness	0.000	Supported
		H3	IIAM effectiveness positively influences the business sustainability	0.000	Supported
		H4a	Human resource capabilities positively influence the internal audit process.	0.004	Supported
		H4b	Technological capabilities positively influence the internal audit process.	0.479	Not Supported
		H4c	Quality capabilities positively influence the internal audit process.	0.010	Supported
		H4d	Regulators positively influence the internal audit process.	0.093	Not Supported
		H4e	Customers and supplier positively influence the internal audit process.	0.355	Not Supported
		H5a	Internal audit process mediates the relationship between human resource capabilities and IIAM effectiveness	0.006	Supported
9	8	H5b	Internal audit process mediates the relationship between technological capabilities and IIAM effectiveness	0.479	Not Supported
		H5c	Internal audit process mediates the relationship between quality capabilities and IIAM effectiveness	0.013	Supported
Not	Supported	H5d	Internal audit process mediates the relationship between regulators and IIAM effectiveness	0.097	Not Supported
Supported		H5e	Internal audit process mediates the relationship between customers suppliers and IIAM effectiveness	0.356	Not Supported



Chapter 6: **Discussion and Conclusion**



H1 The relationship between internal factors and IIAM effectiveness



High organisational quality is dependent on the **optimal use of the skills, talents and knowledge** of a firm's human resources. Human resource capabilities play an important role in the achievement of IIAM effectiveness (Bernardo et al. (2010); Karapetrovic et al. (2006)).

H1b (β= 0.003, t= 0.053, p=0.479)

Naguib et al. (2017) further described that technological capability **does not verify the significant role** of technology in increasing organisational performance.

H1c (β= 0.234, t= 2.226, p=0.013)

Chang, Lin, Yang, and Sheu, (2003) posited that companies could **improve their business performance and sustainability** by developing quality capabilities.



H1 The relationship between external factors and IIAM effectiveness

H1d (β= 0.083, t= 1.300, p=0.097)

The full benefits of standards like ISO 14001 will **not be optimised** when external stakeholders like board members, customers, investors, **regulators** and the media place **little positive** value on the standard (Delmas 2001).

H1e (β= 0.030, t= 0.370, p=0.356)

Psomas and Antony (2015) posited that the effectiveness of the ISO 9001 QMS in manufacturing companies **does not significantly** affected by external environmental.

The relationship between internal audit process and IIAM effectiveness



H2 (β= 0.729, t= 13.752, p=0.000)

According to Elliott et al. (2007), the improvement of **internal audit process** may result in changes to the roles of internal auditors in **corporate governance** and **firm performance** (Knechel et al., 2009)

The relationship between **IIAM effectiveness** and **business sustainability** H3

H3 (β= 0.376, t= 4.284, p=0.000)

According to Hami, Muhamad and Ebrahim (2015), a **firm's consideration of environmental issues and social responsibility** when dealing with internal operations could lead to a **better operational** and **business sustainability** (Bussy, 2012; Saleh, Zulkifli, & Muhamad, 2011; Yang, 2013; Zailani, Jeyaraman, Vengadasan, & Premkumar, 2012).



H4 The relationship between internal factors and internal audit process



The presence of **quality auditors** could significantly increase the ability to identify **conformity**, and a **result**, increasing the value of management system (Kaziliūnas, 2008)

H4b (β= 0.004, t= 0.053, p=0.479)

Knowledge on IT usage (technology) and IT audit have no significant impact on the rate of integration in companies implementing the partially integrated approach (Henderson et al., 2013)

H4c (β= 0.321, t= 2.323, p=0.010)

Suitable TQM tools (quality capabilities) could be adopted to enhance operational processes (Muthusamy et al., 2017)



H4 The relationship between external factors and internal audit process

H4d (β= 0.114, t= 1.326, p=0.093)

Many companies are still doubtful whether certification will be realised into improved processes and increased performance as mentioned in the literature (Petroni, 2001)



H4e (β= 0.041, t= 0.372, p=0.355)

Pan and Zinkhan (2006) who found that a company's inclination for innovation does not automatically bring positive customer satisfaction. Other factors like system characteristics and the pressure from the external competitive market also did not affects the achievement of ISO MS (Psomas & Antony, 2015).

H5a-H5e The mediating effect of internal audit process



The internal audit process has **significant effect** on the relationship between internal factors, specifically human **resource** (β = 0.242, t= 2.530, p=0.006) and **quality capability** (β = 0.238, t= 2.226, p=0.013) and **IIAM effectiveness.**

The significant role played by resources as internal factors, as well as a critical determinant of successful implementation and use of IMS (Savino & Batbaatar, 2015)

H5b

Technology: Some firms have been implementing a **partially integrated approach** and this has created a **weak link** between technological capability and IIAM effectiveness (Henderson et al., 2013)

H5d-H5e

Stakeholder pressure: A study by Psomas and Antony (2015) postulated that aspects like **external environmental pressure** and the system characteristics have **no statistically significant** influence on internal matters, including the effectiveness of ISO MS.



Theoretical

DCT: There is significant link between HR and QC and IIAM Effectiveness but not for TC. Most Malaysian firms have yet to optimise technology in the audit process as explained in Amran, (2012).

Stakeholder: This contradicts past studies findings on the positive relationship. Different firms use either full or partial IMS which not influenced by external parties (Eltayeb et al. (2011). Contingency: IIAM considered as business strategy (Chang, 2003;

Savino & Batbaatar, 2015).

Contributions



The findings suggest that the interrelationships between human resource capability and quality capability are important to enhance internal audit process in achieving IIAM effectiveness.

This study **benefited** to different **parties** such as manufacturing firms, industry player and practitioners where a comprehensive framework introduced to improve IIAM effectiveness.

Industrial 4.0: Policy makers can use this study to determine sustainable manufacturing practice.



Methodological

This study involved two groups of respondents (internal auditor & manager).

There are four different un-correlated dimensions in the performance constructs, hence, the formative construct was used to simultaneously examine the constructs in the model (Becker et al., 2012)

This study is **one of the first** to use a specific model to examine the role of internal and external factors, derived from different theories, as the antecedents of IIAM effectiveness

Contribution to Policy

- Only a small number of companies have implemented the IMS or IIAM mainly due to the lack of intention of the companies towards sustainability;
- As policy makers, we have to investigate why not many companies are willing to adopt the SDGs
- Policy maker should also consider to provide some incentive to encourage companies to get certification on IMS (economy, social and environment) and at the same time to create conducive environment in the long run for a more sustainable Malaysia



Limitation

- Small population- no database and directory of companies that implemented IIAM
- Limited to respondents' perception (primary data)
- Focus on certified manufacturing firms only
- Multiple respondents difficult to get feedback from companies

Future research

- Replicate this study in other countries within Southeast-Asia region
- Widen the **unit of analysis** from a particular type of organisations to other more complex aspect such as network relationships or dyadic relationship.
- Consider the role internal audit processes such as **DMAIC** (define, measure, analyse, improve and control) as a mediator

Conclusion

- Internal factors (human resource and quality capability) have significant relationship with IIAM, while external factors are not which has contradict findings with developed countries.
- Two indicators of IIAM effectiveness (quality and efficiency) created substantial impact on business sustainability
- Internal audit process strongly **mediates** the relationship between internal factors and IIAM effectiveness

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A comparative study of manufacturing firms in Malaysia

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Abstract

Purpose – The purpose of this paper is to investigate the implementation of integrated internal audit management (IIAM) and compare the implementation of IIAM by Malaysian firms with different certifications (ISO 9001, ISO 14001 and OHSAS 18001).

Design/methodology/approach – This study involves three studies on the implementation of integrated internal audit processes. Furthermore, this study compares the implementation of the audit in the selected

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