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The Influence of Supply Chain Management and Net Trade Cycle on Financial Performance

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Abstract— **This research aims to enhance liquidity and profitability of companies via examining the relationship between supply chain management, net trade cycle, and financial performance at manufacturing companies in the Kingdom of Bahrain. Moreover, this research undertakes a broad assessment of the literature to expand the three relationships among supply chain management, net trade cycle, and financial performance in one model as well as measure financial performance by return on assets, return on equity, and operational profit margin. The results show the direct significant relationships between the supply chain management components and the financial performance with the exception of the demand management. Indirect relationship between all supply chain management components and financial performance have been found to be more significant than direct relationship and is moderated by the net trade cycle.**

Keywords— *Supply chain management, Net trade cycle, Financial performance, Structure equation modelling*

1.   Introduction

Supply chain management (SCM) has turned out to be a crucial research area throughout the previous decades. It is described as the management of a network of associations within an organization and between mutual dependent companies with the benefits of making the most of profitability via competences and achieving customer satisfaction. Purchasing, inventory processing, and sales are key components of the SCM. Therefore, there is a relationship with the length of net trade cycle (NTC) which is equal to days of inventory outstanding plus days of sales outstanding minus days of payable outstanding. Moreover, the length of NTC gauges the organizational consumption to transfer resource inputs into cash flows which is a meaningful dimension of an organization's liquidity

and profitability. Thus, it has a relationship with the financial performance which is mainly determined by return on assets, return on equity and operational profit margin. This research examines the relationships among the three aspects: the SCM, the length of NTC, and the financial performance. Some previous studies found that there is a relationship between the SCM and financial performance, while others found that there is a relationship between the length of NTC and financial performance, but none combined all these three aspects in one model. It aims to enhance liquidity and profitability of companies via examining the relationship between supply chain management, net trade cycle, and financial performance at manufacturing companies in the Kingdom of Bahrain.

2.   Literature review

This research contains three subtitles of supply chain management (SCM), the length of net trade cycle (NTC), and financial performance which are discussed in details below. Some previous studies found significant relationship between SCM and financial performance. Others found relationship between NTC and financial performance. Whereas, this research combined all these three relationships of supply chain management and net trade cycle with financial performance in one model. As previous studies have shown, the crucial role of managing supply chain and net trade cycle to enhance financial performance proved to be the pillar for any successful company. The issue here is how a properly managed supply chain can lead to an efficient net trade cycle which will eventually enhance liquidity and profitability of a company with minimum cost.

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2.1   Supply chain management

Undoubtedly, a crucial and in demand area for research are the outcomes of the SCM research herein comprised of opposing outcomes leading to uncertainty among researchers. In addition, supply chain management research is mainly the canter of attention of organizations in developed countries. Organizations in developing countries suffer an actual phase to enhance their equipped capacities, together with supply chain management, to enable them to participate and stay alive in today's competitive business landscape. Competition has radically expanded throughout the previous two decades [1]. Moreover, prior studies have given attention to diverse supply chain management components [2]. The SCM is described as the administration of a network of relationships inside an organization and amid mutual dependent organizations including material suppliers, procurements, manufacture capabilities, logistics, advertising, and associated systems that smoothen the progress that lie ahead and overturn materials flow, finances and information from the innovative manufacturer to ultimate consumer with the advantages of adding value, making the most of profitability throughout competencies, and attaining customer satisfaction [3]. The supply chain management has the monitoring of executive actions that sustain the linear objective commodities flow from suppliers to producers to distributors and retailers [4]. The focusing in SCM is powerfully twisted in the direction of the industrial sector [5]. Supply chain management is mainly measured to engage integration and collaboration crosswise associations and throughout the SC [6]. The four SCM components namely: demand management, communication, integration, and collaboration as independent variables are discussed in details below. Exploring the relationship is among the four SCM components as independent variables and the length of net trade cycle as a moderator variable [7].

Firstly, demand management is focusing on meeting the needs of customers rather than the production process. Information systems regularly split supply from demand management and centre of attention on linear flows of information. Organizations nowadays are more and more familiar with the enhanced SCM which is a basis for competitive advantage. Consequently, many

have rationalized buying and logistics purposes into SCM associations. Information flows from the client first as the foundation. If value is to be added, then the client has to wish for the commodities. Therefore, the client ought to truthfully be the information basis [4]. Where the demand management has inadequate records of qualifying ranges, the representative of that range will require re-evaluation [5]. The demand at the centre of an SC proposes that a focal point on that last part of the chain ought to be expressed further clearly [8]. Eventually, the client who makes a decision which SC has bought main worth for the minimum cost will then be selected to perform commerce with. As a result, receptiveness to demand is the cause of survival [9]. Demand chain design is a comprehensive advertisement consideration and should be controlled to efficiently convene conflicting client requirements. Demand chain management engages in controlling the integration between demand and supply processes and controlling the working relationships amid advertising and SCM [10]. All the parts of dissimilar kinds of flows, customer demand, and SC competitiveness are incorporated with the integration of managerial units [11].

H1: Is there a significant relationship between Demand Management and Net Trade Cycle?

H2: Is there a significant influence of Demand Management on Financial Performance?

Secondly, communication is keeping all members informed of developments that affect their contribution to the supply chain. The point of SCM is to get rid of communication obstacles and abolish idleness throughout controlling processes [12]. As accountable for a considerable figure of complaints is communication. Therefore, communication obviously requires enhancement for who need service from more than one supplier. It is extensively documented that knowledge from diverse purposes is needed to tackle the broad variety of product [9]. However, there is a great need to develop the medium of communication. Consequently, cross functional groups help sort and direct information lines when communication requirements to managerial matters are limited [13]. The most striking effect of the internet is known by accelerating communication among clients and their suppliers, enhancing service ranks, and dropping logistics costs [14]. The widespread

use of information technology and communication capacities like the internet improves the capacity to incorporate the chain. Organizations can create relationships that give way to remarkable performance benefits for ultimate customer satisfaction and decreased cost by the removal of equipped replication [6]. Efficient SC integration needs efficient execution by strategy will at best create minimal tangible benefits and at most awful counterproductive and wear away competitive advantage. Supply chain integration includes problems connecting to integration of centre processes crosswise managerial limitations throughout enhanced communication [15].

H3: Is there a significant relationship between Communication and Net Trade Cycle?

H4: Is there a significant influence of Communication on Financial Performance?

Thirdly, integration is developing single information network that enables all members to share data securely. The integration of supply chains has been found to raise the connections within each part of the chain, superior management to obtain the entire portions of the chain to interrelate in a further well-organized method to generate SC visibility and recognize bottlenecks [16]. The integration of business processes from ultimate consumer throughout innovative suppliers that offer products and information that add value for clients [17]. The SCM is like the organized attempt to grant integrated management to the supply value chain to attain client requirements from suppliers of raw materials throughout production and on to ultimate clients [18]. Nowadays, giving attention is on networks, not on linear chains. This relates to the physical process and the allotment of information. Information has become the main driver of advantage [4]. Managerial structures relating to cross functional groups can assist to abolish integration issues regarding reluctance to change [9]. Flourishing supply chain management needs cross practical integration, and advertising has to engage in a significant position. The face is to settle on how to fruitfully achieve this integration [19]. Latest effort focuses the significance of attaining integration crosswise internal operations with clients and service suppliers [6]. A significant part of efficient supply chain management comprises downstream integration and upstream collaboration of

associates and clients in well-organized way [2]. The integration of supply chain processes is its ability to give a successful means of reduced and improved customer service. A main part of this infrastructure will be on vigorous collaborative collections with trading associates [15]. Its goal is to test the impact of SC integration on managerial presentation throughout structural equation modelling [20]. The possibility for integration of the SC will result to enhanced profit and competitive situation [21]. This is useful in enhancing a model for connecting an organization's supply chain integration strategy to its competitive strategy, and recognizing connection to the development of managerial performance [22].

H5: Is there a significant relationship between Integration and Net Trade Cycle?

H6: Is there a significant influence of Integration on Financial Performance?

And fourthly, collaboration is described as an emotional, volitional, joint- shared process with more departments' team up, have a universal vision, allocate resources, and attain communal objectives [23]. Collaboration with external SC bodies impacts internal collaboration, which may lead to enhance service performance. This relationship functions to assist executives to understand how to smoothen the progress of behavioural change. The success of collaboration relies on the willingness of executives to construct significant relationships and create trust. An organization that searches for achieving a competitive boundary throughout external collaboration must pay more attention internally for a better response for customer expectations [6]. The series of activities initiated by multiple companies to SCM are being expanded in industrialized sectors to enhance the delivery of orders to clients who need collaboration with diverse companies [9]. Management is in a weak position by conventional authority collections, which obstruct the managerial executions, would sustain efficient collaboration [9]. All executives are familiar with technology and dimension systems as main obstacles to flourishing supply chain collaboration. People are the main overpass to flourishing collaborative innovation, and so have not to be unnoticed as organizations spend in supply chain facilitators like technology and dimension systems [24]. The three overpasses are clear information systems, cross- practical

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collaboration, and collaborative forecasting crosswise the SC [25]. Collaboration facilitates partners to decrease costs and permits inventory to cycle throughout clients faster. Missing an enthusiasm to cooperate, an SC will not be competent to reach minimum costs and maximum returns on investment [24].

H7: Is there a significant relationship between Collaboration and Net Trade Cycle?

H8: Is there a significant influence of Collaboration on Financial Performance?

2.2   Length of net trade cycle

The working capital management (WCM) proxy by the length of net trade cycle (NTC) essentially equals to the cash conversion cycle where the entire three parts are articulated as a percentage of sales as moderator variables. The NTC presents a simple and practical method to test the effectiveness of running the company's working capital as it is measured in number of days of sales that it consumes for an organization to transfer resource inputs into cash flows [26]. The length of NTC equals to days of inventory outstanding plus days of sales outstanding minus days of payable outstanding [27]. Moreover, NTC is considered as a useful measurement of a company's liquidity, where a shorter net trade cycle means greater liquidity [28]. The WCM is a proxy by the length of NTC, which should be neither too short nor too long, that it varies from time to time and from different sector to another [29]. Firstly, it is the number of days that is required to sell inventory, in which shorter time is better to increase liquidity at the expense of suffering from stock-outs which may result to lose sales; and so, it should be between speeding up and slowing down. Secondly, to collect account receivables in which shorter time is better than increasing liquidity at the expense of losing customers who are switching to competitors by imposing aggressive credit policy, which may also result to losing sales. Thirdly, to disburse its bills with no sustaining penalties in which longer time is better in investing cash at the expense of losing early payment discounts as well as possibility of receiving bad quality materials from supplier, which would eventually influence the profitability. The influence of WCM on the profit of industrial companies has caught the attention of researchers in various countries nowadays [27].

Many studies have revealed that efficient working capital management in shorter days of outstanding sales and days of outstanding inventory and longer days of payable outstanding are associated with higher profitability [28].

It further examined the relationship amid the length of net trade cycle as moderator variable and the financial performance as a dependent variable [26].

H9: Is there a significant influence of Net trade Cycle on Financial Performance?

2.3   Financial performance

The financial performance is described as how well a company attains its financial objectives [30]. The financial objectives have broadcast accounting variables to gauge the performance of industrial companies such as return on asset. The return on assets is deemed as the major metric for measuring profitability [29], [31], in addition to return on equity [27], and operational profit margin as a dependent variable.

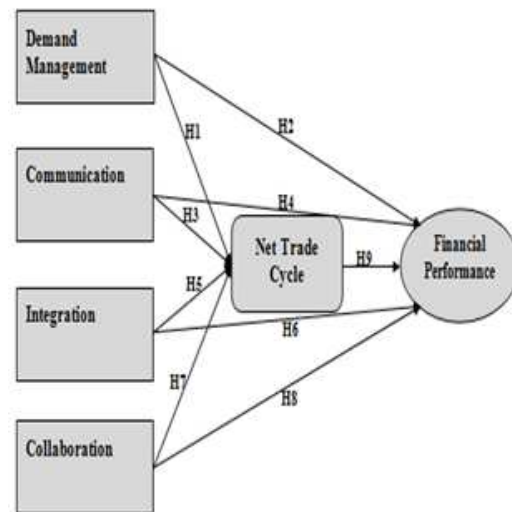The proposed relationships among the six factors are shown in Figure 1 below.

Figure 1. Proposed latent variable model

The model above explains the supply chain management components of demand management which is cost-cutting by production after customer's request. Reducing inventory cost and integration which is also cutting cost by minimizing time in inventory are both connected with the length of net trade cycle from reducing

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days of outstanding inventory; while communication is cost-cutting by adjusting operations in line with changing demands and conditions, and collaboration which is cost-cutting by strengthening relationships between members and improving teamwork are both connected with the length of net trade cycle from reducing days of outstanding sales. Eventually, all of them may lead to enhance financial performance through increasing liquidity and profitability via properly managing supply chain and efficient net trade cycle.

3.   Methodology

It consists of two sections which are Survey instrument and Sample that are discussed in details below.

3.1   Survey instrument

Likert scale (1-5) was used in many previous studies. The first edition of the questionnaire was pilot- checked through actual interviews with the production executives of three listed manufacturing companies in the Kingdom of Bahrain and revised for directness and correctness. Finally, the resultant instrument was evaluated by business faculty at a main public university and adjusted more to ensure that the gauges were suitable, reliable, and user-friendly. The total number of indicators that were retained in the last edition of the questionnaire was 18.

3.2   Sample

The survey was a face-to-face- administered questionnaire to 190 employees in purchasing and production department, accounting and finance department at three listed manufacturing companies in the Kingdom of Bahrain. Of the 190 questionnaires, 71 employees had accomplished the questionnaire. Three of these accomplished questionnaires were not utilized due to missing data and were as a result, kept out from the investigation. Therefore, the sample survey for the research contained 68 questionnaires. Table 1 offers an expressive synopsis of the respondents.

Table 1. Profile of the respondents

Company	Job title
Company-1	Purchasing analyst: 6
	Inventory specialist: 7
	Materials analyst: 7
	Production coordinator: 8
	Senior accountant: 6
	Chief accountant: 1
	Financial controller: 1
	Subtotal respondents: 36
Company-2	Purchasing analyst: 3
	Inventory specialist: 3
	Materials analyst: 3
	Production coordinator: 4
	Senior accountant: 4
	Chief accountant: 1
	Subtotal respondents: 18
Company-3	Purchasing analyst: 2
	Inventory specialist: 2
	Materials analyst: 3
	Production coordinator: 3
	Senior accountant: 3
	Chief accountant: 1
	Subtotal respondents: 14
	Total respondents: 68

4. Results and discussion

It consists of three sections which are Data preparation, Validity and reliability, and Latent variable model analysis that are explained in details below.

4.1   Data preparation

As previously stated, it has an entire 18 indicators in the questionnaire gauging six constructs. Each latent construct is gauged by three indicators. Moreover, it gave indicators with elevated reliability than particular items. Firstly, the conducted questionnaires were sorted on the basis of the company type. Then, the paper questionnaires were processed in Microsoft Excel based on the constructs and their associated indicators.

4.2   Validity and reliability

Before a latent model analysis is performed, the validity and reliability of the constructs have to be

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evaluated. The unidimensionality and reliability of the ranges have to be founded before their convergent and discriminant validities are evaluated.

Unidimensionality measures the degree to which the indicators in a range gauge completely the identical construct. Confirmatory factor analysis (CFA) can be employed to evaluate unidimensionality. A CFA was performed for every one of the six constructs to verify the 18 indicators gauged the construct they were allocated sufficiently. Maximum likelihood evaluation was used to approximate the six CFA models. The supply chain management program was employed during this research to perform the investigations.

The entire parameter estimates of the factor loadings are statistically significant and vary from 0.766 to 0.948 that are shown in Table 2. Moreover, Square factor loadings (equivalent to R^2) point to the percentage of variance in a construct clarified by factor loadings varying from 0.587 to 0.899. Consequently, on the basis of these indices, the entire six constructs have super fits in the entire unidimensionality (Table 2).

The consistency level of a gauge is related to its reliability. The reliability coefficient, Cronbach's α, is usually employed to examine the reliability level. Cronbach's α values of at least 0.700 are considered to be analytic of excellent reliability level [32]. The Cronbach's α for the six factors vary from 0.911 to 0.949, telling that they are everyone reliable (Table 2).

Table 2. Goodness-of-fit indices for CFA

Factors & indicators	Factor loading**	R^2	α
DM (Demand Management)			*.911*
DM1	.913**	.834	
DM2	.889**	.790	
DM3	.766**	.587	
Com (Communication)			*.911*
Com1	.918**	.843	
Com2	.877**	.769	
Com3	.941**	.885	

Factors & indicators	Factor loading**	R^2	α
Intg (Integration)			*.934*
Intg1	.844**	.712	
Intg2	.918**	.843	
Intg3	.904**	.817	
Col (Collaboration)			*.949*
Col1	.932**	.869	
Col2	.852**	.726	
Col3	.948**	.899	
NTC (Net Trade Cycle)			*.936*
NTC1	.933**	.870	
NTC2	.832**	.692	
NTC3	.906**	.821	
FP (Financial Performance)			*.937*
FP1	.939**	.882	
FP2	.827**	.684	
FP3	.919**	.845	

Note: **The entire factor loadings were significant at p<0.01

Content validity relies on how suitable the researcher produced dimension indicators employing the applicable literature to encompass the substance area of the variable that is gauged. The collection of the indicators in the current research was on the basis of an expansion of the literature review, providing an excellent content validity to the gauged variables.

The normed fit index (NFI) taken from the CFA can be employed to evaluate convergent validity. This index gauges the degree to diverse advances to gauging a construct creates the identical outcomes. Regarding threshold, NFI value of at least 0.900 points to a sufficient model fit [33]. Table 3 exhibits that the NFI value of the model is greater than 0.900 pointing to excellent convergent validity.

Discriminant validity gauges the level to which a construct and its indicators are dissimilar from another construct and its indicators. It has a proof of discriminant validity if the Cronbach's α value which is adequately larger than the average of its correlations with these variables [34]. Table 3 demonstrates that the distinction between the Cronbach's α value of each degree and the average

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correlation of each degree with the other levels is sufficiently big, giving confirmation for discriminant validity.

Criterion-related validity is a gauge of how the degrees in a survey instrument are linked with an independent gauge of the applicable criterion. Therefore, the five factors in the model get criterion-related validity when they are extremely and positively correlated with the financial performance. Table 3, the bivariate correlation amid each of the five factors and the financial performance factor go beyond the good enough entry of 0.300 except of DM which is almost 0.300 and so point to rational criterion validity.

Table 3. Scale validity analyses

Factors	Convergent validity NFI	Discriminant validity $\alpha - Avg.r$	Criterion-related validity r between each factor and FP
DM		.174	.269
Com		.079	.529
Intg	.968	.143	.536
Col		.118	.462
NTC		.142	.870
FP		.133	---

Continuing the validity and reliability explained the latent variable model investigation was performed to study the theorized relationships amongst the six factors.

4.3   Latent variable model analysis

SEM was used to test the relationships amongst the six factors. The latent variable model was examined employing data taken from the 68 employees at the three manufacturing companies in the Kingdom of Bahrain. The goodness-of-fit indices for this model are shown in Table 4.

The comparative fit index (CFI) contrasts an anticipated model with the null model. A CFI value is more than 0.900 points to a suitable fit to the data [35]. The table discloses that the CFI value of the model is 0.990, which proposes excellent model fit.

The root mean square error of approximation (RMSEA) is employed to assess the residuals. RESEA must be no more than 0.080 for a sufficient model fit [36]. The table demonstrates that the RMSEA value of the model is 0.076 and points to adequate model fit. All the 18 indicator loadings are significantly on their related factors (Table 4).

Table 4. Goodness-of-fit indices for the latent variable model

Fit index	Value
X^2	48.678
df	35
p-value	.062
CFI	.990
RMSEA	.076

Furthermore, eight of the nine hypothesized paths are significant as revealed in Table 5. The only hypothesis that is insignificant is the direct relationship between the demand management and the financial performance.

Table 5. Statistical relationship of path coefficients for the latent variable model

Path	Path significance
H1. Demand management ⟶ Net trade cycle	Significant***
H2. Demand management ⟶ Financial performance	Insignificant
H3. Communication ⟶ Net trade cycle	Significant***
H4. Communication ⟶ Financial performance	Significant*
H5. Integration ⟶ Net trade cycle	Significant**
H6. Integration ⟶ Financial performance	Significant**
H7. Collaboration ⟶ Net trade cycle	Significant*
H8. Collaboration ⟶ Financial performance	Significant*
H9. Net trade cycle ⟶ Financial performance	Significant****

Note: *p<0.05, **p<0.01, ***p<0.001, and ****p<0.000

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In addition, it showed that the indirect relationships that are moderated by that net trade cycle have greater level of significance than the direct relationships with the financial performance. The standardized coefficient paths and the indicator loadings on their factors are revealed in Figure 2.
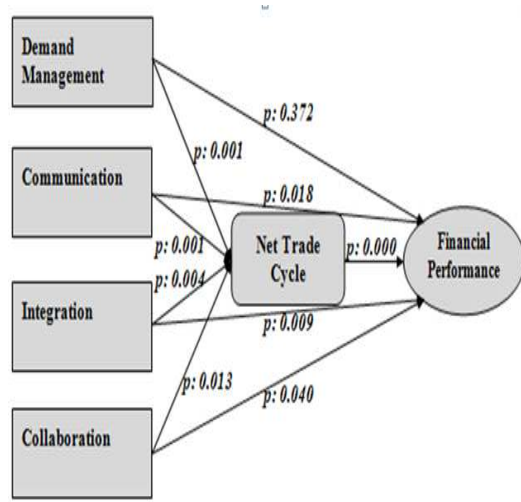

Figure 2. Results of the latent variable model test

Lastly, Table 6 establishes the fact that there is no significant difference among the three manufacturing companies on financial performance, which gives evidence that there is no bias in financial performance results based on a company type.

Table 6. ANOVA on financial performance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.262	2	.631	1.684	.194
Within Groups	24.353	65	.375		
Total	25.615	67			

5.   Conclusion

The outputs reveal that supply chain management components and net trade cycle have a critical role in shaping the financial performance emphasizing on the three manufacturing companies in the Kingdom of Bahrain.

The outputs of this research offer essential indicators to executives relevant to running their companies for greater performance. This research upholds that the supply chain management components and the net trade cycle are holistic in that synergies have to be generated amid them to attain positive financial performance. This research recognizes that all hypotheses contain significant relationships with exception for direct relationship of the demand management and the financial performance. Moreover, the supply chain management components moderated by the net trade cycle has more significant relationships than the direct relationships with the financial performance. The supply chain management components and the net trade cycle operate as the groundwork of these synergies. Consequently, the much needed effective supply chain management components provide added value to customers. In the area of net trade cycle, companies are required to maintain optimal liquidity to maximize profitability.

Supply chain management components and net trade cycle have good propositions for an organization's financial performance outputs. This is to say that the practical implication of properly managed supply chain with efficient net trade cycle is a probable outcome in enhanced financial performance via eliminated unnecessary costs.

Moreover, this research adds to the literature on supply chain management, net trade cycle, and financial performance. Employing structural equation modelling as a good method to examine nine hypotheses further exposes that eight of the nine anticipated hypotheses are significant in the anticipated model. The one non-significant relationship has to be tested more in potential studies to settle on the causes of the bivariate direct relationship amid the demand management and the financial performance that was stated to be significant in other studies was no significant in this research.

A number of preceding studies tried to test the relationship among various SCM components and financial performance or net trade cycle, and financial performance was gauged by return on assets and return on equity only to recognize those applications added to the main enhanced performance. Moreover, the main relationships examined were simple correlations and not all these

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three relationships were combined in one model unlike this research. In addition, this research measured financial performance by return on assets, return on equity, as well as operational profit margin.

Finally, this research faced numerous limitations mundane to assessment research and to the employ of the structural equation modelling. For example, the data were taken from the questionnaires that were relying on the views of the respondents. Furthermore, small sample size of the questionnaires were conducted which may affect the accuracy and generalizability of the extracted outputs. Further research is necessary to enlarge sample size by including more companies in numerous countries to increase credibility of the study and have generalizability of the results.

Acknowledgments

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