




THE INFLUENCE OF INFORMATION SHARING LINKAGES ON BUSINESS PERFORMANCE: EVIDENCE FROM MICRO AND SMALL ENTERPRISES IN SARAWAK



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ABSTRACT

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This paper investigates the relationship between information sharing linkages (i.e. customer linkage, supplier linkage and internal linkage) and micro and small business performance in Sarawak, Malaysia. The empirical results reveal that customer linkage and supplier linkage have positively influenced business performance meanwhile internal linkage has negatively influenced business performance. Due to the challenge of obtaining the responses from business owners and managers of medium-sized enterprises, the responses are recorded only from micro and small businesses. This leads us to conclude that the findings can help small and medium enterprises, researchers and academicians to better understand on the importance of information sharing linkages that affect business performance. Additionally, the findings provide evidence on the ability of the enterprises to utilize the information sharing linkage as a resource to improve business performance.

Contribution/ Originality: This study is one of very few studies which have investigated information sharing linkages towards business performance in service sector. This study documents the influencing factors of information sharing linkages and recommends ways to improve service-based business performance.

1. INTRODUCTION

Small and medium enterprises are flourishing positively around the globe as it provides greater job opportunities compared to large firms (Noor and Siang, 2014). In Malaysia, SMEs contributed 36.6 percent of Gross Domestic Product (GDP) in 2016 as compared to 36.3 percent recorded in 2015 (The Office of Chief Statistician Malaysia Department of Statistic Malaysia, 2017). Practicing information sharing in small and medium enterprises is seen to benefit the organizations. It helps the suppliers to access the data of customers efficiently which help them in refilling production and arrange the schedule of shipment (Devaraj *et al.*, 2007). Besides, it also helps to improve the quality of business performance which simultaneously satisfies the customers (Devaraj *et al.*, 2007). From time to time, it is presumed a lot of information must be conveyed as the business is expanding.

This paper will focus on the service sector of micro and small enterprises in Sarawak, Malaysia. Service sector has recorded a growth in small and medium enterprises GDP in 2016 (OCSMDSM, 2017). Overall, service sector contributes more than 20 percent of GDP which is the highest among of all sectors in small and medium industry in Malaysia (OCSMDSM, 2017). Despite of the service sector contribution on small and medium enterprises GDP, there has been a limited number of research conducted on the service sector in small and medium industry in Malaysia. Due to the divergent nature of service-based business (i.e. intangibility, inseparability, perishability, and variability) compared to the manufacturing-based, the investigation on information sharing linkage in service sector is worth doing (Ya'kob *et al.*, 2017).

Linkage is a business practice that is seen to support firms to better perform in business transactions (Samiee *et al.*, 2004). Hence, involving information sharing into small and medium enterprises gives benefits to improve the quality of business performance which simultaneously satisfies the customers (Devaraj *et al.*, 2007). Considering the importance of assessing the influence of information sharing linkages on business performance, this paper sets for two objectives. First is to investigate the relationship between the information sharing linkage dimensions on business performance; and second is to identify the most influential factor that affects the business performance specifically for service sector in micro and small enterprises in Sarawak.

2. REVIEW OF LITERATURE

2.1. Business Performance

Performance is the subsequent of activities of the business entity, its strategy and operational activities, as well as the management of all business segment (Dragnić, 2014). The measurement of business performance should be consistent with the strategic goals of organizations (Beamon, 1999). The purpose of performance measure is to drive improvement, to maximize the effectiveness of the improvement effort, to achieve alignment with organization's goals and objectives, as well as to reward and to discipline (Kellen, 2003). Organizations favour to report the financial performance (Shepherd and Gunter, 2006) as the top management concerns on the financial gain (Gunasekaran *et al.*, 2004). Business performance could be measured by using either or both objective approach i.e. assessing the secondary data such as financial ratio from a financial report published by management; and subjective approach i.e. assessing the primary data obtained from respondent who are fit to respond through a questionnaire (Vij and Bedi, 2016). This paper assessed the business performance using the subjective approach which is represented by seven indicators – i.e. 1) growth in sales, 2) return on sales, 3) growth in return in sales, 4) growth in profit, 5) growth in market share, 6) return on investment, and 7) growth in return on investment. The seven variables are originated from Flynn *et al.* (2010). All these seven indicators refer to the comparison of monetary performance from previous and recent year (Ya'kob *et al.*, 2017).

2.2. Information Sharing Linkages

This paper categorized information sharing linkages into two categories i.e. internal and external. The external linkages are named as customer linkage and supplier linkage; and the information sharing linkage among employees within an organization is named as internal linkage (Welker *et al.*, 2008). The review of literatures related to information sharing is reported in this section to better understand the three types of information sharing linkage.

2.2.1. Customer Linkage

Customers nowadays are concern on their demands and they are aware of the importance in choosing the right products and services (Koçoğlu *et al.*, 2011). In addition, they expect an organization to perform a faster respond time, shorter product cycle time as well as the customers value-added. Customer linkage focuses on planning, implementing and evaluating effective correlation between providers and recipients within the supply chain (Lee *et al.*, 2007). To be more specific, customer linkage is about sharing information of products or services with

customers in term of taking orders, order placing system, status of order as well as product delivery phase to fulfill customer demands (Lee *et al.*, 2007). The purpose to make a goodwill relationship between organization and customer is to ensure it to be more responsive to customer needs (Flynn *et al.*, 2010). This paper evaluates customer linkage using twelve variables i.e. 1) information sharing via online, 2) product information sharing via phone call, 3) information sharing via counter – walk-in, 4) customer booking acceptance via online, 5) customer booking acceptance via phone call, 6) customer booking acceptance via counter – walk-in, 7) interaction to forecast demand, 8) fast booking system, 9) easy access booking system, 10) booking status sharing during booking scheduling, 11) booking status sharing during service offering, and 12) booking status sharing during service delivery. The twelve variables are adopted from Ya'kob *et al.* (2017). A study conducted by Borsaly (2014) reported that customer relationship management capability contributes to better business performance. This study also supports (Lee *et al.*, 2007) as there is a relationship between customer linkage and supply chain performance. Based on the explanation above, the authors propose hypothesis as follows:

H1: There is a significant and positive relationship between customer linkage and business performance.

2.2.2. Supplier Linkage

Supplier linkage concerns on the organization's strategic linkages with suppliers (Lee *et al.*, 2007). Lee *et al.* (2007) added that this linkage involves the suppliers at the designing stage of the new products, in production planning and inventory management. In fact, it involves the suppliers in developing a rapid response order processing system besides placing a network for suppliers that assures dependable delivery and exchanging information with suppliers. Lee *et al.* (2007) found that supplier linkage is extremely important in business. Hence, there is a need for an organization to invest in the long-term relationship with its supplier (Ibrahim and Ogunyemi, 2012). Ibrahim and Ogunyemi (2012) believed this could be done through fostering and nourishing the linkage with actionable information. This paper sets seven variables to assess supplier linkage i.e. 1) strategic alliance, 2) supplier involvement in designing the new services, 3) supplier involvement in planning the service, 4) supplier involvement in inventory management, 5) booking processing response, 6) network to assure reliable delivery, and 7) use of information technology to exchange information. All seven variables used to assess supplier linkage are borrowed from Ya'kob *et al.* (2017). This study supports (Lee *et al.*, 2007) and Ibrahim and Ogunyemi (2012) who confirmed there is a relationship between supplier linkage and supply chain performance. Based on the explanation above, the authors propose hypothesis as follows:

H2: There is a significant and positive relationship between supplier linkage and business performance.

2.2.3. Internal Linkage

Internal integration refers to the interrelations and balances within an enterprise (Welker *et al.*, 2008). The main roles of internal linkage are to deal with an easy access to key operation data from the integrated database, highly integrated information system linking to numerous internal department in an organization, accessing to inventory information throughout the supply chain and retrieving inventory status in real (Lee *et al.*, 2007). Furthermore, internal linkage utilizes a computer-based planning system between marketing and production, and with a high degree of information system integration for production processes (Lee *et al.*, 2007). This paper assesses internal linkage using nine variables i.e. 1) use of computerized database for service offerings, 2) use of computerized database for distribution, 3) use of computerized database for supplier information, 4) easy access to operational data in a computerized database, 5) use computerized information system to link the internal departments, 6) inventory status retrieval in real time, 7) utilization of a computerized marketing system, 8) utilization of a computerized service offering system, and 9) integration of information system and service offering process. All nine variables are adopted from Ya'kob *et al.* (2017). This study supports (Lee *et al.*, 2007) as there is a

relationship between internal linkage and supply chain performance. Based on the explanation above, the authors propose hypothesis as follows:

H3: There is a significant and positive relationship between internal linkage and business performance.

3. RESEARCH METHODOLOGY

3.1. Sampling

The sampling frame used in this study was from the list of Bumiputera-owned enterprises in Sarawak obtained from the Unit Pembangunan Usahawan Bumiputera¹ under the Jabatan Ketua Menteri Sarawak² (2010) (Bumiputera Entrepreneur Development Unit, 2010). Among the eight areas in Sarawak, Kuching city was selected due to a high concentration of businesses in the state of Sarawak (BEDU, 2010). With the population of 733 service-based enterprises, the sample size of 222 with margin of error of 6.50% was calculated using Slovin's formula. By the way of non-probability sampling, based on convenience, the owners or the managerial-level employees of the micro and small enterprises were treated as the most appropriate person to respond (Chen and Paulraj, 2004).

3.2. Research Instrument

The questionnaire was designed and validated by the expert-raters' judgements and the items used were unique for service-based sectors (Ya'kob *et al.*, 2017). The questionnaire comprises of six sections – four of which were measured using Likert scale. Likert scale was used for customer linkage, supplier linkage, internal linkage, and business performance sections. The scale for customer linkage, supplier linkage, and internal linkage represents the level of respondent's agreement while the scale on business performance section describes the degree of fulfillment by comparing previous and present performances. Lastly, the other two sections collected the information on the business profile and respondents' background.

3.3. Data Collection Method

This study carried out a self-administered survey to allow the respondents to complete the questionnaire at their own convenience. The distribution of questionnaire was conducted within six months and a direct approach was chosen for its accuracy and totality of the responses (Brinkman, 2009). Out of 250 sets of questionnaires distributed, 222 sets are usable for analysis.

4. EMPIRICAL RESULTS

4.1. Factor Analysis

Factor analysis was performed on the 28 items of the independent variables in order to reduce the large number of variables and convert them to the smaller number of factors which is easier to be interpreted and analysed (Zikmund *et al.*, 2009). Keiser-Meyer-Olkin (KMO) and Barlett's test of Sphericity were performed to confirm if factor analysis could be done or not (Tabachnick and Fidell., 2001) KMO value was 0.740 and the Barlett's test was statistically significant (Chi-Square = 4688.644, $p < 0.001$) which is adequate for factor reduction procedure. After five iterations, three components were extracted with Eigenvalues more than 1 and contributing 74.777% of the total variance. The three factors were customer linkage, supplier linkage, and internal linkage. Table 1 shows customer linkage is made up of eight variables, supplier linkage is made up of six variables and internal linkage is made up of five variables.

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Table-1. Rotated Component Matrix for Information Sharing Linkages

Variables	Internal Linkage	Supplier Linkage	Customer Linkage
Our enterprise has a computerised information system to link our internal departments.	0.889		
Our enterprise has information system that integrates with service offering process.	0.888		
Our enterprise has easy access to operational data in a computerised database.	0.886		
Our enterprise utilizes a computerised service offering system.	0.822		
Our enterprise can retrieve inventory status in real time.	0.784		
Our enterprise has computerised database for distribution.	0.773		
Our enterprise has a computerised database for service offerings.	0.761		
Our enterprise utilizes a computerised marketing system.	0.730		
Our enterprise involves suppliers in inventory management.		0.939	
Our enterprise involves suppliers in planning the services.		0.859	
Our enterprise involves suppliers during the design stage for our new services.		0.853	
Our enterprise responds to booking processing with our suppliers.		0.846	
Our enterprise has network with suppliers that assure reliable delivery.		0.841	
Our enterprise uses information technology to exchange information with suppliers.		0.837	
Our enterprise has a booking system that is easy to access.			0.831
Our enterprise accepts customers' booking by online (e.g. social media, e-mail website etc.)			0.823
Our enterprise shares booking status with customers during booking scheduling.			0.790
Our enterprise has a booking system that is fast.			0.753
Our enterprise shares product information with customers by online (e.g. social media, e-mail, website etc.).			0.700

Extraction method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 5 iterations

4.2. Reliability Analysis

Reliability analysis was then performed to measure the accuracy, precision (Cooper and Schindler, 2008) and internal consistency of the items (Cooper and Schindler, 2008; Zikmund *et al.*, 2009). Table 2 shows the results of the reliability test. The Cronbach's alpha of the four factors in the table is considered as acceptable degree of reliability since all are greater than 0.7 (Sekaran, 2000; Zikmund *et al.*, 2009).

Table-2. Reliability Statistics of Extracted Factors

Dimensions	No of items tested	Cronbach's Alpha
Internal Linkage	8	0.938
Supplier Linkage	6	0.944
Customer Linkage	5	0.842
Business Performance	7	0.963

Source: SPSS Calculation

4.3. Correlation

Based on the Pearson correlation analysis between independent variables i.e. internal linkage, supplier linkage, and customer linkage; and dependent variable i.e. business performance, it showed that internal linkage and customer linkage were significantly correlated with business performance at 0.000 significance level while supplier linkage was significantly correlated with business performance at 0.05 significance level. The strength of the correlation coefficient referred to the rule of thumb provided by Hair *et al.* (2009). Coefficient range from 0.81 to 1.00 is very strong, 0.61 to 0.80 is strong, 0.41 to 0.60 is moderate, 0.21 to 0.40 is weak with low correlation, and 0.00 to 0.20 is very weak to no relationship at all. The correlation coefficient indicates that there was a weak

negative correlation between internal linkage and business performance ($r = -0.266$, $p = 0.000$), a weak positive correlation between customer and business performance ($r = 0.392$, $p = 0.000$) and a very weak positive correlation between supplier linkage and business performance ($r = 0.146$, $p = 0.050$). Hence, it is confirmed that there is no multi-collinearity issue which might cause a threat to the validity of analysis (Devaraj *et al.*, 2007).

4.4. Multiple Regression Analysis

Multiple regression analysis was performed to identify the relationship between information sharing linkages and business performance of micro and small enterprises. The results are summarized in Table 3. The results showed that the R square of the model was 0.271 which means that 27.1% of the variance in business performance can be explained by the three independent variables namely internal linkage, supplier linkage and customer linkage. The results of the ANOVA test showed that the model was statistically significant (sig. = 0.000, $p < 0.05$) with F-value 27.013. The result indicated that all the three indicators of the information sharing linkages were significantly related to business performance. The standardised beta coefficient indicates the relative importance of each indicator. Customer linkage ($\beta = 0.362$, $p = 0.000$) generated the highest positive and significant influence on business performance and followed by supplier linkage ($\beta = 0.212$, $p = 0.001$). Although internal linkage ($\beta = -0.369$, $p = 0.000$) was statistically significant but it showed a negative influence towards business performance.

Table-3. Multiple Regressions Analysis

	Standardised Coefficient (Beta)	t-value	Sig.
Internal Linkage	-0.369	-5.836	0.000
Supplier Linkage	0.212	3.264	0.001
Customer Linkage	0.362	6.077	0.000

a. Dependent Variable: Business Performance
R Square = 0.271 F-Value = 27.013
Adjusted R Square = 0.261 Sig. = 0.000

4.5. Hypotheses Testing

Based on the results above, it can be concluded that two out of three hypotheses proposed earlier are supported in Table 4.

Table-4. Hypotheses Testing

Hypotheses		Findings
H ₁ :	There is a significant and positive relationship between customer linkage and business performance.	Supported
H ₂ :	There is a significant and positive relationship between supplier linkage and business performance.	Supported
H ₃ :	There is a significant and positive relationship between internal linkage and business performance.	Not supported

Source: Table-3. Multiple Regression Analysis

5. DISCUSSIONS AND CONCLUSION

Information sharing is useful in order to minimize the effect of demand uncertainty in supply chains (Chan and Chan, 2009). Information sharing also involves trust development and supply chain collaboration (Agus, 2011). The resource-based view (RBV) highlights the ability of enterprises in gaining new knowledge and ability in utilizing information sharing (Sundram *et al.*, 2011). Campo *et al.* (2010) stated in their research that the performance of the enterprises is based on its specific resources and capabilities which are inimitable. This RBV looks at information sharing system as enterprises resources' related to knowledge management and intellectual capital and forming them as components of the structural capital of the enterprises which support the business processes (Campo *et al.*, 2010). Sundram *et al.* (2011) stated that the effort in providing information and making it visible to supply chain

members allows a faster and accurate business decisions which acts as a source of competitive advantage. Thus, the empirical findings of this study support the RBV.

There are three information linkages which are chosen as the dimension in this research i.e. internal linkage, supplier linkage, and customer linkage. These dimensions have been used to identify the significant influence on business performance. This research measures business performance based on financial perspective. The respondents were required to evaluate financial performance in term of growth of sales, return in sales, growth in return on sales, growth in profit, growth in market share, return on investment (ROI) and growth in ROI, as adopted from Flynn *et al.* (2010) and suggested by Ya'kob *et al.* (2017).

As aforementioned in literature review section, customer linkage is basically concentrating on evaluating effective relationship between providers and customers within the supply chain (Lee *et al.*, 2007). The RBV looks at the organization's capability of utilizing resources in order to meet the customers' demands (Sundram *et al.*, 2011). Sundram *et al.* (2011) added that it is a unique form of the organization's capability to have the ability to learn from customers and integrate with customers. The enterprises may also create new products and processes through the ability to respond to customers' changing demands. Hence, it is vital for organizations to strategize ways to maintain a good customer relationship and gain feedback from customers (Sundram *et al.*, 2011). The significant and positive relationship between customer linkage and business performance of micro and small enterprises is confirmed.

Lee *et al.* (2007) stated that supplier linkage focuses on strategic linkages with suppliers. From the RBV perspective, supplier linkage is viewed as the ability of the enterprises to coordinate and integrate resources with suppliers (Sundram *et al.*, 2011). According to Koçoğlu *et al.* (2011) the strategic relationship with suppliers can reduce costs as it may form a dynamic environment which reduces the technological and managerial resources as the competitive advantages. The application of RBV by Devaraj *et al.* (2007) has revealed that the relationship between supplier production integration and enterprises' performances is highly significant. The result of this study proved that there is a significant and positive relationship between supplier linkage and business performance.

According to Flynn *et al.* (2010) internal integration identifies that different departments and functional areas within an enterprise should operate as part of an integrated process. It is because internal integration is expected to be related to performance as it breaks down functional barriers and generates cooperation to meet the customer's requirement rather than operating within the functional silos (Flynn *et al.*, 2010). However, this study fails to discover the positive relationship between internal linkage and business performance. With Sarawak vision to have a new economy powered by three key factors i.e. knowledge, innovation, and digital technology (State Service Modernisation Unit, 2017) initiatives towards digital economy are seen to offer opportunities to small and medium enterprises to enhance their internal linkage knowledge and improve their in-house technological infrastructure to support the organizations' system.

To conclude, the result of this research may offer imperative understandings on the effectiveness of information sharing linkage on micro and small enterprises. The authors suggest that the relationship with customers, suppliers and within the organizations must be continuously improved to gain competitive advantages which simultaneously increase the business performance. As this study focuses on service sector, the owners and managers of micro and small enterprises are encouraged to keep improving the relationship with customers especially on booking system and information of services provided. Besides, the enterprises are recommended to build more networks with suppliers and at the same time maintaining good relationship with current suppliers. In term of internal linkage, the managers of small and medium enterprises must leverage information sharing system to encourage more interactions within enterprises in order to avoid the operational silos which may consequently improve productivity. At the same time, the organizations may consider the investment in implementing the information sharing system within the organization for a long-term success.

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