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## **Linkages between Integrator, Grower Involvement and Business Performance: Focus On Moderating Effect of Managerial Skill**

**Ahmad Shabudin Ariffin, Shahimi Mohtar, Nazim Baluch**

School of Technology Management & Logistics, College of Business, Universiti Utara Malaysia, Malaysia

Corresponding author: Ahmad Shabudin Ariffin, School of Technology Management & Logistics, College of Business, Universiti Utara Malaysia, Malaysia

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**Abstract.** The aim of this study is to explain an investigation over the moderating effects relationship between integrator and grower involvement towards business performance in broiler production. The potential role of managerial skill as moderating variable between the aforementioned independent and the dependant variables are discussed. Broiler supply chain practices and its corresponding performance indicators in the form of broiler farming operations are among the important measures in the dependant variable (business performance). Based on the extensive survey of relevant literature, a research framework is then proposed. The content validity has been done by getting opinion from the experts namely Veterinary officers. Besides that the construct reliability is determined through value from Cronbach's Alpha. The data obtained was satisfactory for content validity and construct validity also fit the model as proposed previously.

**Keywords:** supply chain, broiler, supplier involvement, integrator involvement, grower involvement and business performance

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## I. INTRODUCTION

The Malaysian livestock industry is an important and integral component of the agricultural sector providing employment and producing useful animal protein food for the population, estimated at 25 million people and also to about 4 million people in Singapore. The broiler industry in Malaysia has two types of producers. It comprises commercial farms and conventional farms. Commercial farms that run business on contract farming basis with integrator and conventional farms are belong to independent entrepreneurs. The contracting scheme is therefore more likely to be sustained by its ability to support entrepreneurs than it is by its ability to produce highly competitive. In 2009 there were 3,300 farms in operation carrying a standing population of nearly 186 million broiler chickens. Of these, 22.9% are large farms with more than 50,000 broilers per cycle while 26.2% are medium scale farms carrying 20,000-50,000 broilers per cycle, and the rest are small farms with 20,000 broilers per cycle. Only 9% of local production was used for further processing. However, processors were increasingly getting supplies from cheaper imported poultry meat for value added processing. In fact, most of poultry supplied for processing were from imports. The main challenge facing the industry is its competitiveness, where prior to WTO and AFTA, the broiler industry was highly protected through import bans and quantitative restrictions.

Among all economics activities, agribusiness is developing with great force in the world, stimulated mainly for the increase of the population and demand for food. Agribusiness studies have been the focus of academic research for quite a long time. However, those studies usually have used a theoretical background, connotations, frames of reference and methodologies slightly different of those used in the research on Supply Chain Management (SCM). Although there is extensive on the business performance of manufacturing companies in the developed countries, there is limited empirical information about it in Malaysia. The aim of this study is to propose an investigation over the potential relationships between integrator involvements and grower involvement towards business performance in broiler

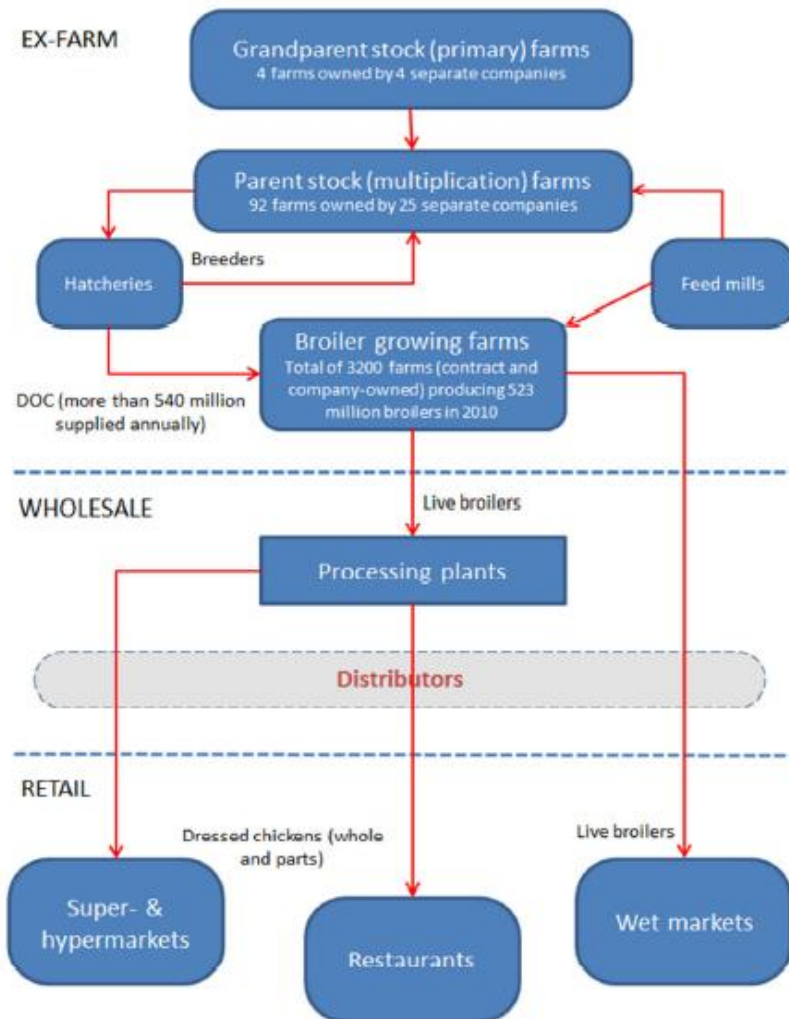
production. The remaining part of this paper is organized as follows: Section II reveals overview of the research problem, section III presents comprehensive survey of literature that enables conceptualization of research framework, section IV depicts proposed research framework. The following section V deals with research aims and subsequently section VI with materials and methods. Section VII describes expected contributions and finally conclusion of the research is presented in section VIII.

## II. PROBLEM OVERVIEW

Broiler contracting involves the use of improved and standardized technology and production practices. This involves supply of inputs, close contact and training of the contract grower. Protecting this investment (in inputs and training) requires that default by growers and turnover in their ranks should be minimum [1]. So for the whole process of broiler production, it has crucial variables need to be addressed empirically.

### *A. Supply Chain in the Broiler Industry*

Main players normally have a vertically integrated supply chain, operating as integrated producer, owning the majority of all breeding, feed, slaughtering and processing facilities (see Fig. 1) as well as operate with a wide variety of distribution channels, ranging from super and hyper markets to distributors restaurants, wet markets and groceries.



Source: Malaysia Competition Commission ("MyCC")

**Figure 1.** The vertically integrated poultry production supply chain

Vertical production chains consist of a single company controlling all aspects of each stage of production. Hatcheries, farms, feed companies processing plants, harvesting team, distribution, and markets can all be integrated into a single corresponding supply system. In response to shifting conditions in both export and domestic markets, many producers are shifting their production further into these types of vertical systems. Moreover, a select number of firms control the majority of

the market. There are some dangers of a few large integrated systems controlling the broiler sector.

### *B. Contract Farming*

The term “contract farming” generally refers to situations in which a farmer raises or grows an agricultural product for a vertically integrated corporation. There are two parties in a typical contract farming arrangement: the grower and the company (Integrator). Broiler contracts consist of contracting out the growing stage. Integrators recruit large farms (growers) to rear broiler chickens for meat according to contractual guidelines. Farming contracts can also help growers mitigate risks posed by fluctuations of input prices and provide a secure market outlet for their product. The latter is especially important because of the limited facilities that process chickens raised by independent farmers. While current trends are moving producers toward vertical integration, there remain many farms currently under contract or with unused infrastructure from past contracts. Most integrators in Malaysia participated contract farming with growers for broiler production. Consequently, the integrators are always involved in every stage of production. While there are key differences between contract farming and complete vertical integration (e.g. who supervises over important growth stages), most aspects of the supply chain are the same.

## III. CONCEPTUALISATION OF RESEARCH FRAMEWORK

### *A. Integrator Involvement in Product Modularity (PM)*

According to [2] PM as a continuum of describing separateness, specificity and transferability of product components in a product system. A product is transferrable if the product components in a product system can be reused by another. It can be separated as it can be disassembled and recombined into new product configurations without loss of functionality [2], and specified as the product component has a clear, unique and definite product function with its interfaces in the product system [3]. If a product has high PM (i.e. modular product design), the

product system has separate modules with well-specified interfaces across the modules, such as those found in personal computers. The product modules can be transferred to different product lines and progressive development projects. In this research, we define product modularity as the use of standardized and interchangeable parts or components that enable the configuration of a wide variety of end products.

### *B. Integrator Involvement in Internal Coordination (IC)*

Recent literature have stated that successful product development can only be achieved if the organization can effectively integrate internal functional units, including marketing, manufacturing, R&D, and purchasing [4], [5]. Diverse internal integration mechanisms (e.g. cross-functional teams, overlapping, employee involvement, concurrent engineering, collocations, dedicated teams, empowered teams) have been recommended in different phases of NPD [6], [7], [8]. Thus, this study defines IC as the degree of the coordination among sales and marketing, research and development, and production to inventory management throughout the product development process.

### *C. Integrator Involvement in Product Innovativeness (PI)*

No consensus on the definition of innovativeness has been made, although it is generally regarded as a measure of discontinuity in the marketing and/or technology factors at both industry and firm levels [9], [10], [11]. A comprehensive literature review conducted by [10] shows that it is important to consider both marketing and technological perspectives, as well as the macro-level and micro-level, when identifying innovations. An important part of the research within the new product literature focuses on the effect of PI on product performance [12], [13], [14], [15], [16], [17]. Even with the widely varying conceptualizations and operationalization of the PI construct [11] there are prevailing views arguing that both higher and lower PI increases product performance while the opposite holds true for moderate PI. Based on the above, this study seeks to provide new evidence

concerning PI as a phenomenon and extend the empirical literature to the relation between PI and performance. Given the above considerations, the research questions that this empirical study raises, attempt to identify differences, if any, in performance measures at both the product level.

#### *D. Integrator Involvement (II)*

According to [18], [19] II is recognized as an important way for new product success. In this study, SI is defined as the direct participation of the supplier during the product development processes [20]. Suggested by [21], [22] it involves joint product design, process engineering and production operations with key suppliers. II helps secure resources and capabilities, which the manufacturers do not have but essential for product innovation [23]. It helps the supplier learn new technology applications while the buyer can actively shape product performance [24].

#### *E. Grower Involvement (GI)*

Suggested by [25], [26] GI is defined as the direct participation of the customer in the design and development stages of New Product Development (NPD), in which the customer engages in problem solving activities and co-develop the final forms of the product with the manufacturers. It involves joint product design, process engineering, and production operations with key customer. According to [26], [5] the early involvement of customers or early customer inputs is essential to develop new products. It facilitates the project teams to recognize new ideas and opportunities while avoiding development delays due to a mismatch of the ideas and the customer needs [27].

#### *F. Business Performance*

If organizations cannot measure performance, they cannot manage their business [28]. This statement summarizes the necessity of performance to measure, and as direct consequence, and to evaluate their performance [29]. Business performance is measured in many different ways such as innovation, profit and sales, rate of new

product development, customer satisfaction, customer retention, operating costs, profitability and return on investment (ROI) [30]. Business performance is also defined as measurable result of the level of attainment of organizations goals [31] or measurable result of the organization's management of its aspects (ISO 1999). In this study, business performance is measured in relations to the supply chain perspective and is accordingly use conventional supply chain measures such as revenues, customer and supplier satisfaction, customer retention, and operating cost. The study also proposes the inclusion of green practices (poultry waste management) in the measurement of business performance.

## VI. RESEARCH AIMS

This study attempts to answer the following research questions; is there any moderating effect the relationship between integrator involvement, grower involvement and business performance? Based on this question, follows are the objectives of this study: To investigate the moderating effect of managerial skills on the relationships between Integrator Involvement, Grower Involvement and business performance.

Hypotheses:

H1: Product modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H2: Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H3: Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H4: Internal Coordination (IC) has positive significant relationship with Business Performance (financial) moderated by decision making skill.



H5: Product Innovativeness (PI) has positive significant relationship with Business Performance (financial) moderated by decision making skill.

H6: Grower Involvement (GI) has positive significant relationship with Business Performance (financial) moderated by accountancy and financial management skill.

H7: Grower Involvement (GI) has positive significant relationship with Business Performance (financial) moderated by decision making skill.

H8: Product modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H9: Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H10: Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H11: Product Modularity (PM) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill.

H12: Internal Coordination (IC) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill.

H13: Product Innovativeness (PI) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill.

H14: Grower Involvement (GI) has positive significant relationship with Business Performance (non-financial) moderated by accountancy and financial management skill.

H15: Grower Involvement (GI) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill.

## V. MATERIAL AND METHODS

General approach of this research is quantitative. With regard to the research problem which try to study the relationship between integrator involvement, grower

involvement towards business performance. Furthermore if there, any moderating effect managerial skills level between independent variable and dependent variable. It performed based on survey strategy and it is appreciating of descriptive-analytical method. Statistical of these research consisted of a whole industry broiler production businesses (growers) selected as statistical sample.

This study was conducted in Peninsular Malaysia includes; Kedah (33.3%), Pulau Pinang (14.7%), Perak (28.1%), Selangor (0.4%), Negeri Sembilan (14%), Melaka (1.4%), Kelantan (5.6%), Terengganu (0.4%) and Pahang (0.7). This chapter first presents descriptive statistics based on the data collected from the surveys. The responding companies' background information will be analyzed, followed by statistical analysis of the data and discussion of the results with regards to the hypotheses testing.

The total respondents were 285: which translates to the following percentages of the categories mentioned besides each; 64.2 percent farm owners, 1.8 percent general manager, 1.4 percent managing directors, 5.6 percent managers, 20.4 percent senior managers and others (managerial position) 6.7 percent. The number of years in that particular position includes the range of 1 to 5 years 19.5 percent, 6 to 10 years 37.9 percent, 11 to 15 years 27.7 percent, 16 to 20 years 9.8 percent and more than 20 years 5.3 percent. The percentage of businesses with permanent employees: less than 50 (89.5%); 50 to 100 (6.7%); 100 to 150 (3.2%) and more than 150 (0.7%). The two types of housing included: Closed House System (CHS) 55.4%; and Conventional System (CS) 44.6%. The average sale percentage of the businesses for last three years is; up to RM1, 000,000 (88.41%), RM1, 000,001 to RM2, 000,000 (11.2%); and over RM2, 000,000 (0.4%). The average profit percentage of the businesses for last three years is; up to RM100, 000 (96.1%),; and over RM100,000 (3.9%).

Specifically designed questionnaire was the instrument used for data collection. A set of attributes was included in the questionnaire that encompassed the grower and integrator involvement, grower managerial skills, and grower business performance question about broiler production and professional characteristics. To ensure its content and face validity, the research instrument was reviewed several times by the research group (Research Department, Department of Veterinary Services of Malaysia) and then implemented in a pilot test to measure its reliability. Questionnaire reliability was estimated by calculating Cronbach's alpha. Reliability for each variable is explained below:

#### Moderating effect

The present study is designed to determine the moderating effect of integrator and grower involvement on the business performance (financial) and (non-financial) relationship. Barron & Kenny (1986), moderator variable effects the direction/or strength of the relationship between an independent variable and a dependent variable. The most remarkable finding is that seven interaction effects were encountered. As mention previously, it is possible to suggest that the relationship between integrator and grower involvement may be moderated by managerial skill. The hierarchical regression analysis was used to test the moderating effects of managerial skill on business performance strength as depicted in Table 1.0 and Table 1.1 Next, the hypotheses results will be discussed thoroughly related to moderating effect of managerial skill on relationship between integrator and grower involvement towards business performance.

Table: 1.0

Hierarchical Results Using Managerial Skill as a moderator in the Relationship between Integrator Involvement and Grower Involvement Towards Business Performance (Financial).

Independent variable	Std Beta Step 1	Std Beta Step 2	Std Beta Step 3
<i>Model variables</i>			
Product Innovativeness	0.052	-0.018	-0.043
Product Modularity	0.310	0.281	0.295
Internal Coordination	0.293	0.201	0.209
Grower Involvement	0.077	0.024	0.018
<i>Moderating variable</i>			
Accountancy and Financial Management Skill		0.297	0.359
Decision Making Skill		0.521	0.468
<i>Interaction terms</i>			
PI*Accountancy and Financial Management Skill			-0.245
PM* Accountancy and Financial Management Skill			0.047
IC* Accountancy and Financial Management Skill			0.297
GI* Accountancy and Financial Management Skill			0.081
PI*Decision Making Skill			-0.077
PM*Decision Making Skill			-0.042
IC*Decision Making Skill			0.172
GI*Decision Making Skill			0.219
R <sup>2</sup>	0.363	0.410	0.473
Adjusted R <sup>2</sup>	0.354	0.400	0.456
R <sup>2</sup> Change	0.363	0.047	0.063
Sig. F Change	0.000	0.000	0.000
Durbin Watson			1.705

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Table: 1.1

Hierarchical Results Using Managerial Skill as a Moderator in the Relationship between Integrator Involvement and Grower Involvement Towards Business Performance (Non-Financial).

Independent variable	Std Beta Step 1	Std Beta Step 2	Std Beta Step 3
Model variables			
Product Innovativeness	0.405	0.338	0.383
Product Modularity	0.113	0.085	0.091
Internal Coordination	0.133	0.046	0.026
Grower Involvement	0.222	0.172	0.199
Moderating variable			
Accountancy and Financial Management Skill		0.281	0.302
Decision Making Skill		-0.069	-0.021
Interaction terms			
PI*Accountancy and financial Management Skill			0.260
PM* Accountancy and financial Management Skill			-0.027
IC* Accountancy and financial Management Skill			-0.076
GI* Accountancy and financial Management Skill			-0.015
PI*Decision Making Skill			-0.144
PM*Decision Making Skill			0.065
IC*Decision Making Skill			0.115
GI*Decision Making Skill			-0.079
R <sup>2</sup>	0.528	0.571	0.601
Adjusted R <sup>2</sup>	0.522	0.563	0.588
R <sup>2</sup> Change	0.528	0.042	0.031
Sig. F Change	0.000	0.000	0.000
Durbin Watson			1.727

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

### ***Moderating effect of managerial skill towards business performance (financial)***

The hypotheses predicted that managerial skill (decision making, accountancy and financial management skill) moderate the relationship between integrator and grower involvement towards business performance. Table 1.0 and Table 1.1 illustrate the results of hierarchical regression analysis using integrator and grower involvement dimension. The standardized coefficient (Beta) for each variable is shown in the respective step.

The independent variable integrator involvement (product modularity, product innovativeness, and internal coordination) and grower involvement entered at step one. Second step, showed moderator variables; decision making skill (Beta=0.521) was significant 0.000 ( $R^2=0.617$ , F change value=10.642); moderator accountancy and financial management skill (Beta=0.297) was significant 0.000 ( $R^2=0.557$ , F change value=8.211). In the third step, the interaction between decision making skill, accountancy and financial management skill with independent variables; product modularity, product innovativeness, internal coordination and grower involvement showed that there were a number of significant relationships with business performance (financial),  $R^2=0.473$ ,  $R^2$  change=0.063, F change=8.211,  $p<0.05$ . The significant interactions were between product innovativeness and accountancy financial management skill; internal coordination and accountancy financial management skill; internal coordination and decision making skill and grower involvement and decision making skill. Thus, the hypotheses were supported.

Hypothesis H1 stated that product modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no

moderating effect by accountancy and financial management skill between product modularity towards business performance (financial) relationship.

Hypothesis H2 stated Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show that internal coordination has made significant, unique contributions to the variance of business performance (financial) after accountancy and financial management skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that internal coordination has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H3 stated Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show that product innovativeness has made significant, unique contributions to the variance of business performance (financial) after accountancy and financial management skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that product innovativeness has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H4a stated that Product Modularity (PM) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by decision making skill between product modularity towards business performance (financial) relationship.

Hypothesis H4 stated Internal Coordination (IC) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that internal coordination has made significant, unique contributions to the variance of business performance (financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that internal coordination has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H5 stated that Product Innovativeness (PI) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by decision making skill between product innovativeness towards business performance (financial) relationship.

Hypothesis H6 stated that Grower Involvement (GI) has positive significant relationship with Business Performance (financial) moderated by accountancy and



financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between grower involvements towards business performance (financial) relationship.

Hypothesis H7 stated Grower Involvement (GI) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that grower involvement has made significant, unique contributions to the variance of business performance (financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that grower involvement has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between grower involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships grower involvement and business performance.

***Moderating effect of managerial skill towards business performance (non-financial).***

The hypotheses predicted that managerial skill (decision making, accountancy and financial management skill) moderate the relationship between integrator and grower involvement towards business performance. Table 4.28 and Table 4.29 illustrate the results of hierarchical regression analysis using integrator and grower involvement dimension. The standardized coefficient (Beta) for each variable is shown in the respective step.

The independent variable integrator involvement (product modularity, product innovativeness, and internal coordination) and grower involvement are entered at step one. Second step, showed moderator variables; decision making skill

(Beta=0.532) was not significant ( $R^2=0.532$ , F change value=2.0); moderator accountancy and financial management skill (Beta=0.281) was significant 0.000 ( $R^2=0.571$ , F change value=27.525). In the third step, the interaction between decision making skill, accountancy and financial management skill with independent variables; product modularity, product innovativeness, internal coordination and grower involvement showed that there were a number of significant relationships with business performance (non-financial),  $R^2=0.601$ ,  $R^2$  change=0.31, F change=5.267,  $p<0.01$ . The significant interactions were between product innovativeness and accountancy financial management skill; internal coordination and decision making skill and product innovativeness and decision making skill. Thus, the hypotheses H3e, H3f and H4f were supported.

Hypothesis H8 stated that product modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between product modularity towards business performance (non-financial) relationship.

Hypothesis H9 stated that Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between internal coordination towards business performance (non-financial) relationship.

Hypothesis H10 stated Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by

accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show that product innovativeness has made significant, unique contributions to the variance of business performance (non-financial) after accountancy and financial management skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that product innovativeness has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H11 stated that Product Modularity (PM) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by decision making skill between product modularity towards business performance (non-financial) relationship.

Hypothesis H12 stated Internal Coordination (IC) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that internal coordination has made significant, unique contributions to the variance of business performance (non-financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that internal coordination has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is

strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H13 stated Product Innovativeness (PI) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that product innovativeness has made significant, unique contributions to the variance of business performance (non-financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that product innovativeness has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H5b stated that Grower Involvement (GI) has positive significant relationship with Business Performance (non-financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between grower involvements towards business performance (non-financial) relationship.

Hypothesis H6b stated that Grower Involvement (GI) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between grower involvements towards business performance (non-financial) relationship.

## VII. CONCLUSION

The study has empirical investigation over moderating effects managerial skills relationship between integrator and grower involvement towards business performance in the poultry industry. The scope of the research is the Malaysian local poultry industry. The content validity has been done by getting opinion from the experts namely Veterinary officers. Besides that the construct reliability is determined through value from Cronbach's Alpha. The data obtained was satisfactory for content validity and construct validity also fit the model as proposed previously. A research framework and goals are advocated in relations to the above matter. Upon completion, the research is expected to be beneficial for relevant policy makers thirsts for some empirical evidence on the green supply chain practices in local poultry industry.

## References

- [1] Key, N, & Runsten, D. Contract farming, smallholders and rural development in Latin America: the organization of agro processing firms the scale of out grower production. *World Development*, 27(2), 1999, pp.381-401.
- [2] Schilling, M. A. Toward a general modular systems theory and its application to interfirm product modularity. *Academy of Management Review*, 25(2),2000, pp. 312-334.
- [3] Ulrich, K. The role of product architecture in manufacturing firm. *Research Policy*, 24(3),1995, pp. 419-440.
- [4] Gerwin, D, & Barrowman, N. J. An evaluation of research on integrated product development. *Management Science.*, 48(7), 2002, pp.938-953.
- [5] Clark, K. B, & Fujimoto, T. *Product Development Performance*. Boston, MA.: Harvard University Press, 1991.
- [6] Griffin, A. Product development cycle time for business-to-business products. *Industrial Marketing Management*, 31, 2002, pp.291-304.
- [7] Hargadon, A. B, & Eisenhardt, K. M. *Speed and quality in new product development*, in Cole, R.E. and Scot, W.R. (Eds), *The Quality Movement Organization Theory*. Sage, New York, NY, 2000.
- [8] Zirger, B. J, & Hartley, J. L. A conceptual model of product development cycle time. *Journal of Engineering & Technology Management*, 11, 1994, pp.229-251.

- [9] Calantone, R. J, Chan, K, & Cui, A. S. Decomposing product innovativeness and its effects on new product success. *Journal of Product Innovation Management*, 23, 2006, pp.408-421.
- [10] Garcia, R, & Calantone, R. A critical look at technological innovation typology and innovativeness terminology: a literature review. *The Journal of Product Innovation Management*, 19, 2002, pp.110-132.
- [11] Danneels, E, & Kleinschmidt, E. J. Product innovativeness from the firm's perspective: its dimensions and their relation with project selection and performance. *Journal of Product Innovation Management*, 18, 2001, pp.357-373.
- [12] Cooper, R. G. The dimensions of industrial new product success and failure. *Journal of Marketing*, 43, 1979, pp.93-103.
- [13] Zirger, B. J, & Maidique, M. A. A model of new product development: an empirical test. *Management Science*, 36(7), 1990, pp.867-883.
- [14] Kleinschmidt, E. J, & Cooper, R. G. The impact of product innovativeness on performance. *Journal of Product Innovation Management*, 8, 1991, pp.240-251.
- [15] Cooper, R. G, & Brentani, U. D. New industrial financial services: what distinguishes the winners. *Journal of Product Innovation Management*. 8(1), 1991, pp. 75-90.
- [16] Song, M. X, & Parry, M. E. A cross-national comparative study of new product development processes: Japan and the United States. *Journal of Marketing*, 61, 1997, pp.1-18.
- [17] Song, M. X, & Montoya-Weiss, M. M. Critical development activities for really new versus incremental products. *Journal of Product Innovation Management*, 15(4), 1998, pp.124-135.
- [18] Song, X. M, & Benedetto, A. D. Supplier's involvement and success of radical new product development in new ventures. *Journal of Operations Management*, 26(1), 2008, pp.1-22.
- [19] Van Echtelt, F. E. A, Wynstra, F, Weele, V. A. J, & Duysters, G. Managing supplier involvement in new product development: a multiple-case study. *Journal of Product Innovation Management*, 25, 2008, pp.180-201.
- [20] Ragatz, G. L, Handfield, R. B, & Scannell, T. V. Success factors for integrating suppliers into new product development. *Journal of Product Innovation Management*, 14, 1997, pp.190-202.
- [21] Fliess, S, & Becker, U. Supplier integration - controlling of co-development processes. *Industrial Marketing Management*, 35, 2006, pp. 28-44.
- [22] Takeishi, A. Bridging inter- and intra-firm boundaries: management of supplier involvement in automobile product development. *Strategic Management Journal*, 22(5), 2001, pp.41-53.
- [23] Grant, R. M. Prospering in dynamically-competitive environments: organizational capability as knowledge integration. *Organization Science*, 7(4), 1996, pp.375-387.
- [24] Athaide, G. A, & Klink, R. R. Managing seller-buyer relationships during new product development. *Journal of Product Innovation Management*, 26, 2009, pp.566-577.

- [25] Feng, T, L. Sun, & Zhang, Y. The effects of customer and supplier involvement on competitive advantage: an empirical study in China. *Industrial Marketing Management*, 39(8), 2010, pp.1384-1394.
- [26] Brown, S. L, & Eisenhardt, K. M. Product development: past research, present findings, and future directions. *Academy of Management Review*, 20(2), 1995. pp.343-378.
- [27] Ittner, C. D, & Larcker, D. F. Product development cycle time and organizational performance. *Journal of Marketing Research*, 34(1), 1997, pp.13-23.
- [28] Kaplan, R. S, & Norton, D. P. The Balanced Scorecard-Measures that Drive Performance. *Harvard Business Review*, 1992. pp.71-79.
- [29] O'Raily, M, Wathey, D, & Gelber, M. ISO 14031: Effective mechanism to environmental performance evaluation: Corporate Environmental Strategy. 1(3), 2000, pp.267-275.
- [30] Zack, M, McKeen, J, & Singh, S. Knowledge management and organizational performance: an exploratory analysis. *Journal of Knowledge Management*, 13(6), 2009, pp.392-400.
- [31] Daft, R. I, & Marcic, D. *Understanding management* (3rd ed.). Fort worth, USA: Harcourt College Publishers, 2001.