IMPACTS OF INFORMATION TECHNOLOGY ON BUSINESS PERFORMANCE OF SMALL-SIZED AGRIBUSINESS FIRMS

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Abstract

It has been identified that Small and Medium-sized Enterprises (SMEs) in Indonesia play an important role in the Indonesia's economy. Its contribution to the national economy (i.e., GDP and export values), however, is relatively minimal as to compare with its unit numbers and number of labor involved. It is also of considerable lower than those of large-sized enterprises whose unit number and number of labor involved were much lower than those of SMEs. This, to some extent, indicates that SMEs' productivity is relatively low. Some improvements are required accordingly. Information and communication technology, especially Internet technology application within SMEs is regarded to have the potentials to significantly increase their business performance. This study is aimed at investigating factors that potentially affect internet adoption and analyzing the impact of internet adoption on business performance of small-sized agribusiness firms. Modified Supply Process Model was adopted as an approach model in this study. One hundred and one small-sized agribusiness owners/operators were randomly selected as respondents. Primary data were collected and analyzed using path analysis. Results of the study showed that internet adoption within small-sized agribusiness owners/operators was significantly affected by perceived ease of use, internet self efficacy, internet anxiety, and personal innovativeness. Small-sized agribusiness firms' business performance was affected by the level of internet adoption (i.e., non-adopter, potential adopter or adopter). This indicates that internet technology has the potentials to increase business performance.

Keywords : *individual factors, Internet technology adoption, small-sized agribusiness firm, firm performance.*

INTRODUCTION

Small and medium-sized enterprises (SMEs) in Indonesia have been identified to have significant number of unit and number of labor involved. It was reported by the Department of Cooperative and Small and Medium-sized Enterprises (KUKM) of the Republic of Indonesia that in 2004 SME owners/operators was more than 43 million which was approximately 99 percents of total business owners/operators either small, medium or large-sized enterprises. Meanwhile, number of labor involved, according to the report, was nearly 80 million which was close to 90 percents of total labor working within industrial sectors. Its contribution to the Gross National Product, however, was of significantly lower than that of large-sizes enterprise counterparts.

In relation to this, the Department of Industry and Trade (2002) has reported that one out a number of primary weaknesses of SMEs in Indonesia—as indicated by its economic contribution—was that limited capabilities and aggressiveness of SME owners/operators in accessing market and limited use of

information and communication technology in managing their business. These conditions were also found within small-sized agribusiness firm owners/operators. According to OECD (2004) reports, there are a number of factors that inhibit information and communication technology utilization within SMS owners/ operators. These include (i) incompatible business processes, (ii) limited knowledge and managerial skills of ICT utilization, (iii) costs of development and maintenance of electronic systems (i.e., hardware), (iv) limited computer and communication networks infrastructure, (v) lack of trust and security of ICT utilization, (vi) law uncertainty relating to ICT utilization in business management, and (vii) various challenges related to adoption electronic business processes. This report indirectly indicated that although ICT was not the only solution option for improving business performance, ICT utilization and electronic business strategies have positive impact on business performance. In other words, ICT utilization has the potentials to contribute to firm performance improvement, for examples improvement in market share, product variability, product adjustment (with customer needs), and/or a better response towards customer needs and wants.

In Indonesia, the role of ICT in improving firm performance, especially small-sized enterprises, has not been optimal. This was illustrated through level of development as well as ICT utilization which were relatively low and was left behind other countries, either in Asia or in the world. This was represented by, among others, limited ICT infrastructures availability, limited number of units of computer owned by small-sized firms, and limited Internet access.

Table 1. ICT Indicators in Indonesia, Asia, and the World

Indicators	**Indonesia**	**Asia (avg)**	**World (avg)**
Total Telephone /100 population	**34.87**	44.92	60.04
Cellular Mobiles/100 population	**28.30**	29.28	40.91
Main Telephone/100 population	**6.57**	15.81	19.39
Internet users/100 population	**7.18**	11.57	17.39
Broadband subscribers/100 population	**0.05**	2.71	4.30

Source: International Communication Union (2007)

This study, in general, was aimed at investigating factors that affect ICT, specifically Internet utilization—in this case e-business portal within small-sized agribusiness firms, and at analyzing their impacts on firm performance. More specifically, this study was aimed at analyzing (i) the effects of perceived ease of internet use, perceived internet usefulness, computer/internet anxiety, internet self efficacy, and personal innovativeness on level of internet adoption and (ii) the effects of level of internet adoption on firm performance.

METHODOLOGY

Ninety-two small-sized agribusiness firm owners/operators were randomly selected and were used as respondents in this study. Research variables include (i) perceived internet usefulness—PU, (ii) perceived ease of internet use—PEOU, (iii) computer/

internet anxiety—ANX, (iv) Internet self-efficacy—ISE, (v) personal innovativeness—PI, and (v) firm performance (measured through firm productivity, sales volume growth, gained profit, product quality improvement, production processes improvement). Primary data were collected from respondents using validity and reliability tested questionnaires (see Sugiharto *et al*., 2007).

A Modified Supply Process Model which consists of Technological Acceptance Model (TAM) and ICT & Performance Model (van Akkeren and Cavaye, 1999; Chambers and Todd, 2000; Bitler, 2001; Lee, 2001; Jones et al., 2004) which also have been modified, as shown in figure below, was used in this study.

In this model firm performance—FP is a function of internet adoption level—IA, which is a function of five variables (i.e., perceived internet usefulness—PU, perceived ease of internet use—PEOU, computer/internet anxiety—ANX, internet self-efficacy—ISE, and personal innovativeness—PI). Path analysis model was performed to analyze causal relationships amongst variables.

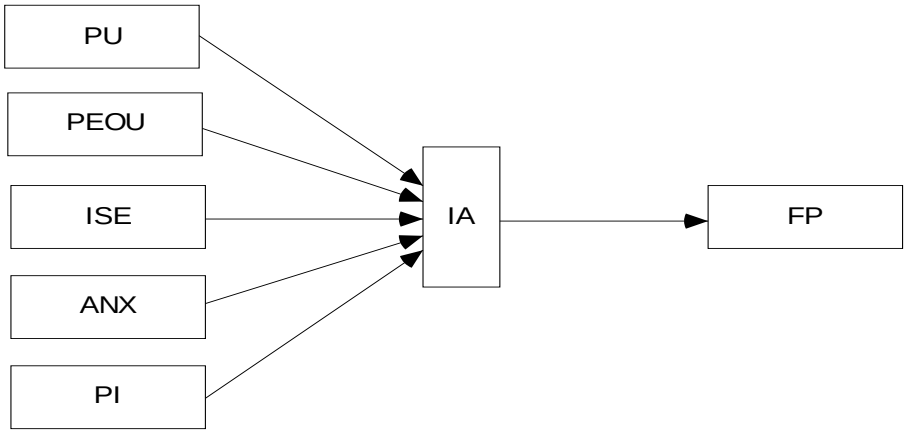

Figure 1. Research Model

RESULTS AND DISCUSSIONS

It has been explained previously that individual factors (i.e., perceived usefulness—PU, perceived ease of use—PEOU, internet self-efficacy—ISE, internet anxiety—ANX, and personal innovativeness—PI) has the potentials to influence individual small-sized agribusiness firm owners/operators in adopting information and communication technology (i.e., Internet technology). In this study level of Internet adoption is divided into three categories namely Internet adopter, potential Internet adopter, and Internet non-adopter. Level of Internet adoption, meanwhile, was assumed to affect firm performance—FP.

The pattern of causal relationships between individual factors and level of Internet adoption and, in turn, between level of Internet adoption and firm performance is depicted in Figure 1. The magnitude of causal relationships amongst variables which are represented by regression coefficients, either unstandardized or standardized (i.e., path coefficients), are depicted respectively in Figures 2 and 3 which follows.

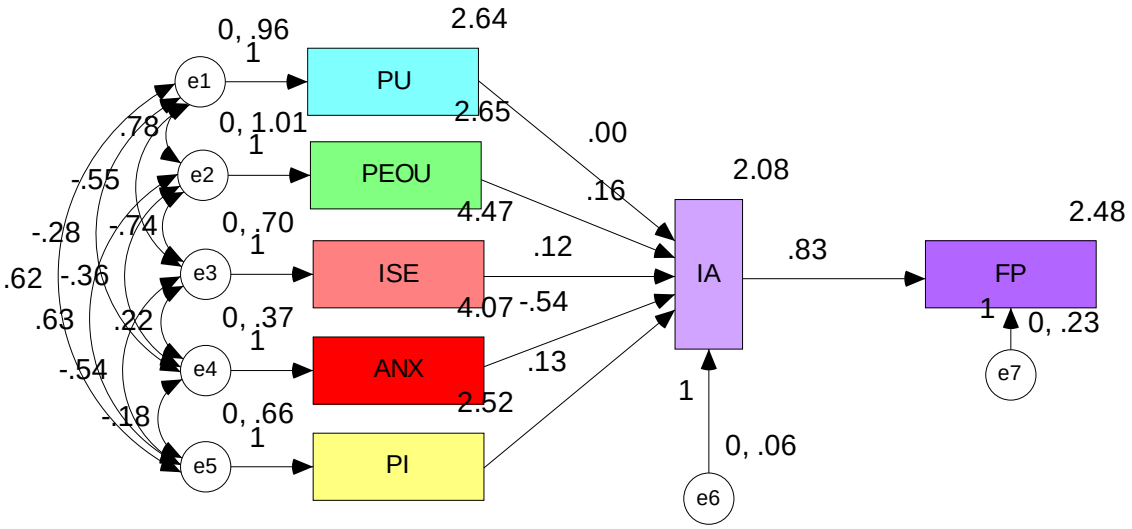

Figure 2. Unstandardized Regression Coefficients

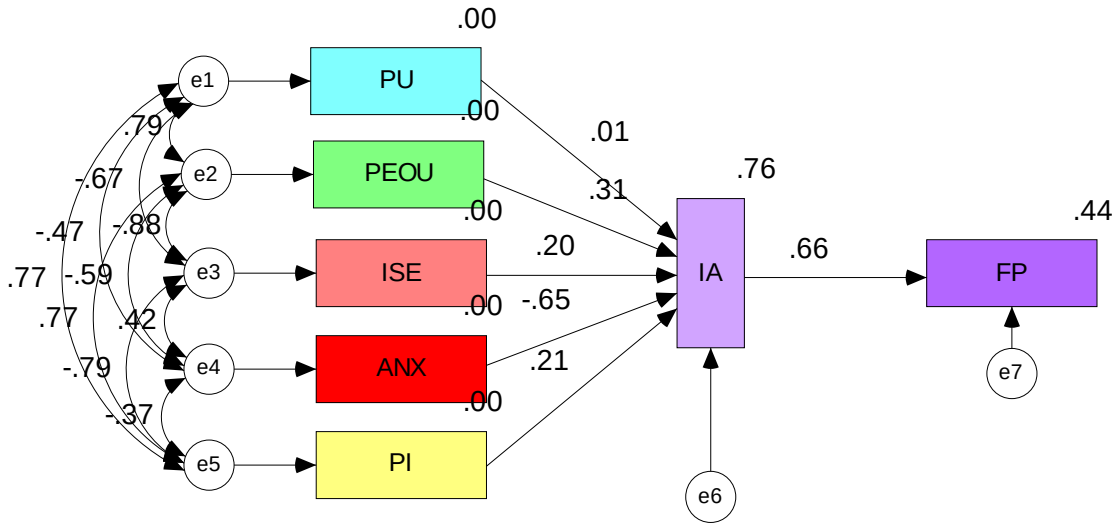

Figure 3. Standardized Regression (Path) Coefficients

Effects of Individual Factors on Level of Internet Adoption

The magnitude of causal relationships between individual factors and level of Internet adoption within small agribusiness firm owners/operators can be summarized from Figure 2. Their magnitudes and directions of these causal relationships can be presented in a regression equation.

$$IA = 2.08 + 0.003\underline{PU} + 0.155\underline{PEOU} + 0.121\underline{ISE} - 0.540\underline{ANX} + 0.131\underline{PI} \quad (1)$$

As shown in regression equation above, in different magnitudes, perceived usefulness—PU, perceived ease of internet use—PEOU, internet self-efficacy—ISE, and personal innovativeness—PI positively and, along with

computer/internet anxiety—ANX which negatively affect level of Internet adoption—IA of small-sized agribusiness firm owners/operators, simultaneously affect level of Internet adoption—IA. These indicate that level of Internet adoption within small agribusiness firm owners/operators was affected simultaneously by individual factors for approximately 76 percent. Partially, however, there were only three out of five individual factors that have significant effect on small agribusiness firm owners/operators' level of Internet adoption. These include, as shown in Table 2 below, perceived ease of internet use—PEOU, computer/internet anxiety—ANX, and personal innovativeness—PI

Table 2. Regression Weight

Variables	Estimate		S.E	C.R.	Prob.
	Unstandardized	Standardized			
PU	0.003	0.006	0.048	0.060	0.952
PEOU	0.155	0.307	0.070	2.207	0.027
ISE	0.121	0.198	0.072	1.682	0.093
ANX	-0.540	-0.649	0.053	-10.252	***
PI	0.131	0.209	0.061	2.162	0.031

Interestingly, computer/internet anxiety—ANX, whose effect on level of Internet adoption is negative, was found as individual factor that have the strongest effect on level of Internet adoption. This means that small agribusiness firm owners/operators who perceived that Internet technology is of difficulties to learn and requires significant amount of investments (expensive) tend not to adopt this technology in managing their business. Strengths or weights of the two other factors that partially and positively affect small agribusiness firm owners/operators' level of Internet adoption (i.e., perceived ease of internet use—PEOU and personal innovativeness—PI) were much lower than that of computer/internet anxiety—ANX. Small agribusiness firm owners/operators who perceived that Internet technology is easy to learn and to use and who have higher personal innovatiness tend to adopt Internet technology for managing their business. In general, these findings are in line with those of either Davis (1989), Heilman *et al*. (1999), Riemenschneider and Mykytyn (2000) or Brown (2002).

Effects of Level of Internet Adoption on Business Performance

The magnitude or strength or weight and direction effect of level of Internet adoption of small agribusiness firm owners/operators was depicted in Figures 2 and 3 and can be presented in a regression equation as follows.

$$\underline{FP} = 2.48 + 0.83\underline{IA} \qquad (2)$$

It was found that level of Internet adoption of small agribusiness firm owners/operators significantly affects firm business performance. Although its magnitude of influence was relatively low (i.e., approximately 44 percent), this findings indicates that small agribusiness firm owners/operators believe, to some degree, that Internet technology—if it is applied correctly and properly, has the potential to, in various of ways, increase their firm business performance. This seems to agree with results of research conducted by Dulipovici (2002) in Canada which found that Internet application has a close relationship with firm business performance.

CONCLUSIONS

Conclusions

It can be concluded that level of Internet adoption is affected simultaneously by individual factors such as perceived usefulness, perceived ease of internet use, internet self-efficacy, computer/internet anxiety, and personal innovativeness. Level of Internet adoption, meanwhile, has a positive effect on firm business performance. The primary and important finding resulted from this study that should be highlighted is that information technology—in this case Internet technology, has the potential to significantly contribute to increase small agribusiness firm's business performance. The secondary and also important finding, which could not be separated from the primary ones, is that individual factors play a very important role in any efforts (e.g., information and communication education programs) towards level of Internet adoption improvement amongst small agribusiness firm owners/operators.

Implication

Internet technology has been found to have significant contribution towards small-sized agribusiness firm business performance improvement. Accordingly Internet technology should be an integrated part of any training, extension, or any other education program that is directed at improving small-sized agribusiness firm business performance. In addition, since the level of Internet adoption within small-sized agribusiness firm owners/operators is affected by individual factors (i.e., perceived usefulness, Internet self-efficacy, and particularly perceived ease of use, Internet anxiety, and personal innovativeness), these factors should properly be taken into account and included in curriculum of extension or educational programs such the one previously mentioned. Additionally, special attention should be addressed towards Internet anxiety which has a strongest negative effect on level of Internet adoption.

Acknowledgement

This research was parts of Competitive Research Grant (*Penelitian Hibah Bersaing*) which is administered and financially supported by the Directorate of Research and Extension (DP2M) of the Directorate General of Higher Education (DIKTI), the Ministry (formerly department) of National Education. Accordingly, I sincerely thanks to these institutions for their various assistances. My warm thanks also go to Rector, Head of Research Institution, and Dean of the Faculty of Economics, Gunadarma University, for their incredible and continuous supports and encouragements. Last, but foremost, my special thanks are directed to two anonymous reviewers for their supportive comments and constructive suggestions.

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