

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) : CAN IT IMPROVE CUSTOMIZATION CAPABILITIES AND BUSINESS PERFORMANCE OF SMALL AND MEDIUM SCALE MANUFACTURING INDUSTRY?

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Abstract: *The development of information and communication technology (ICT), very rapidly. Various application systems created to support and simplify business processes. Many companies provide a lot of fund to invest and adopt ICT. This study aims to investigate the impact of the adoption of ICTs on the customization capabilities and performance of the business, which includes the marketing performance and financial performance. A total of 77 companies of small and medium scale manufacturing industries included in the sample. Data were collected by questionnaire, and analyzed with multiple linear regression. The results showed that the adoption of ICT significantly positive impact on the customization capabilities and financial performance, but no significant effect on the marketing performance. Customization capabilities have a significant effect, both on marketing performance and financial performance*

Keywords: *Adoption of ICT, Customization Capabilities, Marketing Performance, Financial Performance*

INTRODUCTION

The development of information and communication technology (ICT), very rapidly. Integration of computer technology, information systems and communication technologies, as well as the existence of the Internet, has spawned a very favorable synergies. Various application systems were created, to support and simplify business processes. In a moment, ICT becomes at hand that is implicated. Almost all parties be infected to invest and adopt ICT. No exception for large enterprises, medium and small scale. With its unique characteristics, ICT is believed to bring a positive impact on the development and performance of a business.

As the characteristics of other types of SMEs, small and medium scale manufacturing industry has resilience to the crisis better than large-scale

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industry. One key is greater flexibility. small and medium scale manufacturing industry is able to make modifications quickly both in product, process, design, and distribution. Thus, dynamic customer demand can still be served. In the operations management literature, it's called customization capabilities. Yes, small and medium scale manufacturing industry can survive, through its ability to customize.

In Bekasi, the development of small and medium-scale manufacturing industry, there is quite significant. They are generally a buffer for large-scale industry in the region. Associated with the development of ICT, initial observations show an increase quite rapidly, on investment activity, and adoption of ICT, which is carried out by small and medium scale manufacturing industry in the Bekasi area.

This study aims to investigate how the impact of the adoption of ICTs on the customization capabilities in small and medium scale manufacturing industries. Moreover, it also analyzed the impact on business performance, which includes the performance of marketing and financial performance.

LITERATURE REVIEW

1. Adoption Of Information and Communication Technology (ICT)

Information technology can be defined either broadly or narrowly. Turban & Volonino (2010: 12) states, that information technology is defined broadly as follows: "Broadly, the collection of computing system used by an organization is termed information technology. Its use, strategy and management".

While information technology in the narrow sense, according to Turban & Volonino (2010: 13) is: "Information technology, in its narrow definition, refers to the technological side of an information system. It includes the hardware, data bases, software, networks, and other electronic devices. It can be viewed as a subsystem of an information system. Sometimes, though, the term information technology is also used interchangeably with information system".

OECD defines the Information and Communication Technology (ICT), as a series of activities that facilitated electronic equipment that includes processing, transmission and presentation of information. IT is a convergence of three areas, namely information technology, data and information, as well as problems of socio-economic (Budi Hermana, 2008).

Information technology is often matched with computer technology. In this regard Besterfield et.al. (2003: 223), states: "Information technology is defined as computer technology (either hardware or software) for processing and storing information, as well as communication technology for transmitting information".

In the literature diffusion and adoption of information technology, in various ICT research, there is no definition of ICT generally accepted as a standard definition. ICT can be considered as the technological aspects of Information Systems (IS) which is aimed at the creation of computer-based information systems. ICT can be defined as “the technology involved in the operation, collection, transport, retrieve, storage, presentation access, and transformation of information in all its forms” (Ghobakhloo et.al: 2011).

ICT adoption is defined by Tanetal. (in Ghobakhloo et.al: 2011) as the application of Information and Communication Technology (ICT), including computer hardware appliance, software, and network necessary to connect to the internet. According Attaran (in Ghobakhloo et.al: 2011), “Information technology is defined as the ability offered to the organization by the computer, application software, and telecommunications to provide data, information, and knowledge to people and process”.

Furthermore, with regard to the concept of relationships with suppliers, Carrand Smeltzer (in Ghobakhloo et.al: 2011) defines ICT as the use of automated purchasing systems, link suppliers through electronic data interchange (EDI), the relationship of computer-to-computer with a major supplier and finally information Systems. In that view, the terms of ICT will cover a wide range of information processing and computer applications in organizations. ICT will include IS, ICT, internet and their infrastructure, including computer hardware and software, technological process or transmit information to improve the effectiveness of individuals and organizations.

Furthermore, the term ICT also includes computer applications and hardware devices are required, Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), EDI, and Enterprise resource planning (ERP), which increases the productivity of the business, as well as any technology used for electronic commerce (EC) such as electronic funds transfer (EFT), intranet, extranet, collaborative planning, forecasting, and replenishment (CPFR) application, supply chain communication systems, and electronic supply chain management system.

Definition of ICT adoption in the organization can be found in some literature. IT adoption is a decision to accept and use IT innovations (Premkumar and Roberts, 1999; Tanetal, 2009; Thong, 1999; Zaltmanetal, 1973), the full use of innovation as intended by the designer (Boving and Bødker, 2004), successful implementation (Thong, 2001), the rate of use (Davis, 1989, Grandon and Pearson, 2004) and the effectiveness and success of ICT is adopted, based on acceptance or satisfaction with the ICT (Al-Gahtanietal, 2007; Al-Gahtaniand King, 1999; Foong, 1999; Palvia, 1996; Palviaand Palvia, 1999). While Thong and Yap (1995) defines ICT adoption are as implementing computer hardware and software solutions that provide operations support, management, and decision making in the organization.

Forth & Mason (2004) examines the adoption and utilization of ICTs. In their research they measure the adoption of ICT through ICT facilities and equipment used by the company 1). Computers/PCs used by employee, 2). Network - computers/PCs networked or interconnected for communication purpose, 3). Remote access – employee able to access company’s computer system remotely from non-company site, 4). Email used for internal and external communication, 5). Electronic data interchange (EDI) used to communicate with supplier or customer, 6). Internet – employee have access to internet for other than email use, 7). Website – company has ste on world wide web, 8). Internet and/or extranet – private secure networking running on internet protocol.

Gallego et.al (2011) divides the three groups of ICT adoption: 1) ICT improve employee productivity. This group includes the number of PCs per employee, ICTs pending per employee, number of employees who work with the PC, the number of PCs connected to the Internet. 2) ICT improve overall organizational performance, including the company has been using internet access, and the company has a website. 3) ICT improve corporate connections to other companies or customers, covers an area of internet and internet applications.

2. Customization Capabilities

Increasingly sophisticated technology, requiring goods and services according to the needs of consumers. The company can produce goods and services selection, through what is known as mass customization. With flexible manufacturing, mass customization is now possible. According to Piller and Tseng (2010: 7) mass customization is the process to implement personalization.

According to Heizer & Render (2011:286) Mass customization is the rapid, low-cost production of goods and service that fulfill increasingly unique customer desires. Mass customization is the creation of products and services that can meet the customer is getting a unique, fast and cheap. Mass customization give a variety of products that are usually supplied by low-volume manufacturing (focus on the process) at a cost, same as high-volume manufacturing and standardized (focus on product).

Mass customization is the ability to offer highly configure bundles of non-price factors configured to suit different market segments (with the ideal target of total customization : i.e. market size of 1) – but to do this without incurring cost penalties and the setting up of a trade-off of agility versus prices (Bessant&Tidd, 2011: 219).

According to Schroeder, Goldstein & Rungtusanatham (2011: 75) mass customization, is a strategy to provide products in many sizes and high volume.

Mass customization is "the company's ability to quickly produce customized products on a large scale at a cost that is comparable to the non-customized products" (Tu et al., In Finch, 2008:124).

According to Coletti & Aichner (2011: 28-29), there are two kinds of mass customization definition, namely the definition of work and the definition of a visionary. Based on the working definition, Mass customization is a strategy that creates value with some form of customer-company interactions at the operating level stage fabrication/assembly to create products that are tailored to the cost of production and prices are similar to mass-produced products. Meanwhile, according to the definition of a visionary, mass customization is a strategy that creates value by some form of company-customer interaction on stage design level operations to create customized products, following a hybrid strategy combining cost leadership and differentiation.

According to Heizer & Render (2011: 287-288) Mass customization showed high volume systems where product build-to-order. build-to-order means producing to customer orders, not fore casts. Build-to-order to be successful and become a winning strategy when executed successfully. But the build-to-order with high volume is difficult. Some key challenges are: 1). product design should be imaginative and fast; 2). Process design must be flexible and able to accommodate changes in both design and technology; 3). inventory management requires strict control; 4). tight schedule to keep track of orders and material from design through delivery are other needs of mass customization.; 5). Being a responsive partner in the supply chain can result in ineffective collaboration.

When a company must be able to integrate the flexibility and customization with low cost per unit and perform efficient production with high output volume the company has a mass customization capability (Finch, 2008:124).

According to Piller and Tseng (2010: 17) companies that control mass customization, find a unified way to address the challenges faced. This requires the company to obtain the competencies of the three core capabilities that drive business sustainable mass customization. The main advantage of mass customization is to see it as a package of organizational capabilities that can complement and enrich the existing system.

Furthermore Salvador et al. (2009), call them as Solution Space Development, Robust Value Chain Design, and Choice Simplification. The theme behind this capability is often not new. Some of them have been there for years. But a successful mass customization demands to assemble these methods into capabilities in a meaningful way and integrate them.

At first, mass customization is applied only to tangible products, but it turns out the same procedure can also be applied to the product and services. Mass customization services will be felt at the time consumed and produced simultaneously, as customers in the services involved in the production process. With mass customization there is a lot of effort to adapt the services offered to the public area to the needs of the individual (Coletti & Aichner, 2011:24).

Mass Customization is not just about the variety of products, but how economically, knows exactly what customers want and whenever the customer wants it. Mass Customization is a challenge that requires improvement of operational capabilities. The manager must use the organization's resources are imaginative and aggressive to establish an agile process, which produces a specific product quickly and cheaply (Heizer & Render, 2011:75).

Kind of customization capabilities proposed by Bessant & Tidd (2011: 219) includes:

1. Distribution customization, Customers may customise product/service packaging, delivery schedule and delivery location but the actual product/services is standardised.
2. Assembly customization, Customers are offered a number of predefined options. Product/services are made to order using standardises components.
3. Fabrication customization, Customers are offered a number of predefined design. Productcs/services are manufactured to order.
4. Design customization, Customers input stretches to the start of the production process. Product do not exist until initiated by a customer order.

3. Business Performance

Performance is a condition that must be known and confirmed to certain parties, to determine the level of achievement of an institution associated with the organization's vision, and to know the positive and negative impact of an operational policy (Whit more in Rival et.al, 2011:2). The performance of the organization is the ability of the organization to achieve its goals through the use of resources efficiently and effectively (Daft, 2008:15).

Organizational effectiveness is the degree of how far the organization successfully achieve the targets set. The effectiveness of the organization means giving a product or service that is valued customer. While the efficiency of the organization, associated with the amount of resources used to achieve an organizational goal (Daft, 2008:14).

The company's performance is the result of accumulative all work activities, within the company. Measurement of company performance commonly used include the productivity of the organization, organizational effectiveness, and industry rankings (Robbins & Coulter, 2012:188).

Some performance measures of the company is: (1) profitability; (2) market position; (3) productivity; (4) product leadership; (5) personnel development; (6) employee attitudes; and(7) social responsibility (Certo & Certo, 2009:520-523).

The company's performance can also be measured through the balance score card perspectives, ie use certain generic measures. The generic indicators, tend to be measures of outcome that reflects the many common objectives and strategies similar structures throughout the process industry or scope of the company. Generic outcome measures is tend to be alagindikators, such as profitability, market share, customer satisfaction, customer retention and employee skills.

In some literature, it is mentioned that the measurement of business performance the most common is marketing performance and financial performance. Marketing performance is a representation of a business position in the competition. Marketing performance can be measured by market share, customer acquisition, customer satisfaction and customer retention. Meanwhile, the financial performance is a measure of how well the company meets the owner's expectations and create a profit. Financial performance can be measured by earnings growth, sales, and return on investment.

4. The Relationship Between Adoption of ICT, Customization Capabilities and Business Performance

Many people seem to agree that mass customization is based on flexible manufacturing technology and information technology which allows the manufacturing system to provide a high variety of products at low cost (Piller & Tseng, 2010:46).

With the technological advances of manufacturing, information technology, communication, and product design, higher levels of mass customization can be realized (Ramani et.al. 2012). Peng et.al (2011) found that IT positive effect on the ability of mass customization in manufacturing companies.

The relationship between ICT with customization capabilities can be explained by organizational information processing theory. These theory suggests a positive relationship between task uncertainty and the amount of information that must be processed by decision makers during task execution (Galbraith, 1974; Kitchen and Spickett-Jones, 2003). Greater uncertainty indicates that more information is required and processed during task performance. Consequently, uncertainty

heightens an organization's information processing needs. Therefore, the organization must enhance its information processing capabilities to cope with the increased information processing needs so as to keep its operations effective and efficient (Premkumar *et al.*, 2005).

Task complexities are enhanced in a Mass Customization environment. The Mass Customization tasks involve customizing products to specific customer needs in a quick and cost effective manner. Because Mass Customization involves manufacturing tasks that vary across different customer orders, Mass Customization manufacturers must process more information to execute these tasks precisely and timely. Mass Customization also increases the inter-dependency among multiple functional units. Within the firm, Mass Customization requires marketing and operations to coordinate closely in order to respond better to the increasingly differentiated customer needs (Liu *et al.*, 2010). Wind and Rangaswamy (2001) state that understanding customer needs is critical to MC and thus Mass Customization offers opportunity for better channel management and closer manufacturing-marketing relationships. Between firms, these differentiated needs must be quickly sensed at customer touch points and transferred to supply chain partners. Thus, in a Mass Customization environment, differentiated customer needs, high product variety and increased interdependency across the supply chain increase the task uncertainty and the amount of information that must be processed. In such an environment, a firm must improve its information processing capabilities in order to deal with the enhanced information processing needs.

ICT can be used to process large amounts of information effectively and therefore should be conducive to Mass Customization. Modern ICT has the potential to enhance information processing and coordination both within the firm and across firm boundaries (Gattiker and Goodhue, 2004). ICT makes information processing less costly, rendering the governance of MC-related activities more efficient (Argyres, 1999). The general need for ICT support in manufacturing operations has been highlighted in the literature (Boynton and Victor, 1991; Boynton *et al.*, 1993; Yassine *et al.*, 2004; Warschat *et al.*, 2006). For example, Banker *et al.* (2006) observe that ICT significantly impacts manufacturing practices and operational performance.

Mass Customization is an instance of manufacturing operations characterized by high uncertainty and information richness in task execution. ICT enhances a firm's information processing capabilities thus accommodating the increased information processing needs of a Mass Customization system. Therefore, ICT should play an even more important enabling role in a MC environment than in a traditional mass production environment.

Research results indicate that CNC, FMS, and Internet had a positive and significant impact on MC in broad market firms which may be derived from their ability to improve one MC dimension at no expense to the other. However, results indicated that different technologies were associated to improvement in different mass customization dimensions. On one hand, CNC and Internet had a positive impact on product customization ability, at no expense to labor productivity. On the other hand, FMS had a positive impact on labor productivity, at no expense to product customization ability. (Silveira & Fogliato, 2005).

The relationship between the ability of customization with business performance can be explained by the theory of Resource-Based View (RBV). RBV is an approach to achieving competitive advantage that emerged in 1980s and 1990s, after the major works published by Wernerfelt, B. ("The Resource-Based View of the Firm"), Prahalad and Hamel ("The Core Competence of The Corporation"), Barney, J. ("Firm resources and sustained competitive advantage") and others. The supporters of this view argue that organizations should look inside the company to find the sources of competitive advantage instead of looking at competitive environment for it.

According to this theory, companies can gain a competitive advantage through unique resource. Resource consists of two types, resource tangible and intangible resources. Customization capability is one of the intangible resources (Whellen & Hunger, 2009)

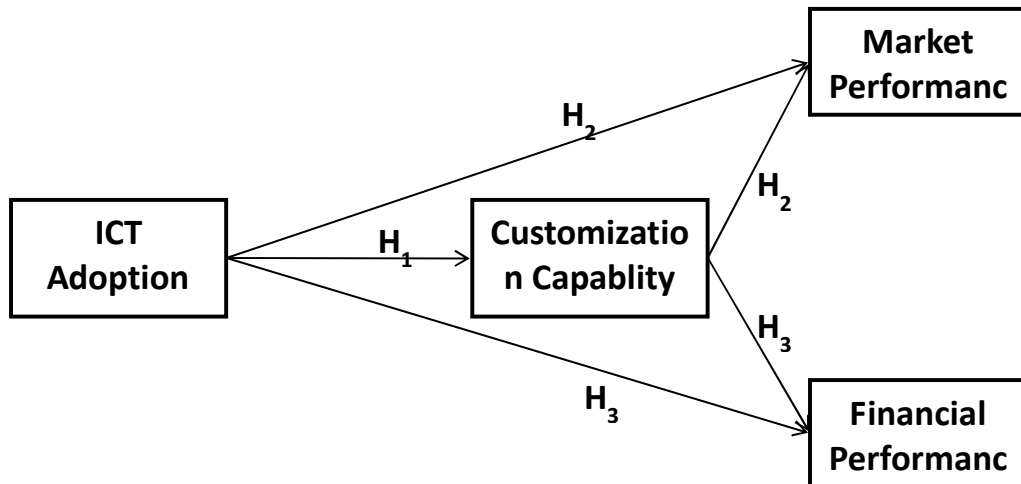
According to RBV proponents, it is much more feasible to exploit external opportunities using existing resources in a new way rather than trying to acquire new skills for each different opportunity. In RBV model, resources are given the major role in helping companies to achieve higher organizational performance (Hit et. al, 2005).

Based on the above framework of thinking, we developed a hypothesis to be tested in this study as follows:

- Hipotesis 1 : Adoption of ICT has a positive impact on the ability of customization on small and medium scale manufacturing industries.
- Hipotesis 2 : ICT adoption and customization capabilities have a positive effect on the performance of marketing, both sumult an or partially.
- Hipotesis 3 : ICT adoption and customization capabilities have a positive impact on financial performance either simultaneously or partially..

Visually, the hypothesis to be tested can be illustrated in the research model as illustrated in Figure 1 below:

Figure 1: Research Model



RESEARCH METHODS

The unit of analysis in this study is the SME manufacturing in Bekasi. We used purposive sampling method, where samples must meet the following criteria: 1). Has been established for more than 5 years; 2). Incorporated, minimum of CV; 3). The employee has at least 10 people. With these criteria, elect a total of 77 SMEs which can be taken as a sample.

Data were collected through questionnaires, compiled by the rating scale models. To obtain relevant data and accountable, respondents each represented by SME manager-level employees.

ICT Adoption variable refers to Ghobakloo et.al (2011), which consists of seven dimensions, namely *PC per employee*, *ICT expenditure per employee*, *worker with PC*, *worker connected to internet*, *internet areas*, *networks*, and *internet application*. Customization Capabilities variable refers to the Bessant & Tidd (2011:219) which consists of distribution customization, assembly customization, fabrication customization, and design customization. Marketing performance refers to the Day (2003) measured by two indicators of the growth of new customers, and the growth of sales volume. Financial performance is measured by growth in net profit, and return on investment.

To analyze the relationship between variables, statistic used is multiple linear regression. Statistical significance testing performed by t test and f.

RESULTS AND DISCUSSION

1. Effect of adoption of ICT on Customization Capabilities

To analyze the effect of the adoption of ICT on customization capabilities simultaneously, we use the parameter R square.

**Table 1
Model Summary**

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	,385 ^a	,148	,137	31,96269

a. Predictors: (Constant), ICT

Table 1 shows that R2 which is a parameter for the effect of the adoption of ICT on customization capabilities simultaneously is equal to 0.148. That is, 14.8% change in the customization capabilities are determined by changes in the adoption of ICT. While the other 85.2% is determined by other factors not analyzed. This value is significant, the F value of 13.061, significant at the 1% level (see table 2).

**Table 2
ANOVA^b**

<i>Model</i>		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	13343,292	1	13343,292	13,061	,001 ^a
	Residual	76621,020	75	1021,614		
	Total	89964,312	76			

a. Predictors: (Constant), ICT

b. Dependent Variable: Customization

Partially, the effect of the adoption of ICT on customization capabilities can be seen from the regression coefficient of 5.325. That is, every increase of one unit will increase the adoption of ICT 5.325 units customization capabilities.

Table 3
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	75,128	12,778		5,880	,000
ICT	5,325	1,474	,385	3,614	,001

a. Dependent Variable: Customization

Regression coefficient of the influence of ICT adoption, on customization capabilities, partially, has at-value of 3.614 with 0.001 sig that showed a significant effect at $\alpha = 1\%$. Thus, these results support the hypothesis 1, where there is clear evidence that the adoption of ICT have a positive influence on customization capabilities the small and medium scale manufacturing industries.

2. Effect of Adoption of ICT and Customization Capabilities On Marketing Performance In Simultaneous and Partial.

Effect of Adoption of ICT and Customization Capabilities To Performance Marketing simultaneously can be seen from R square values in Table4, where the value is 0.407. This means that 40.7% of marketing performance changes are determined by changes in ICT adoption and customization capabilities.

Table 4
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0	1	,638 ^a	,407	,391

a. Predictors: (Constant), Customization, ICT

Table 5 shows the F value of 25.350 with 0,000 sig. This shows that the adoption of ICT and customization capabilities simultaneously have a significant influence on the performance of marketing.

Table 5
ANOVA^b

<i>Model</i>		<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	126842,091	2	63421,046	25,350	,000 ^a
	Residual	185133,986	74	2501,811		
	Total	311976,078	76			

a. Predictors: (Constant), Customization, ICT

b. Dependent Variable: MarketPerf

Table 6 shows the effect of ICT adoption on performance marketing has a regression coefficient of 2.909 with at-value of 1.164 and 0.248 sig. That is not significant at $\alpha=5\%$. It can be concluded that, partially, ICT adoption did not have a significant effect on the performance of marketing.

The customization abilities influence on the performance of marketing, has a regression coefficient of 1.090 with at-value of 6.034 and 0.000 sig. That is significant at $\alpha=1\%$. It can be concluded, that partially, customization capabilities significant positive effect on the performance of marketing.

Table 6
Coefficients^a

<i>Model</i>		<i>Unstandardized Coefficients</i>		<i>Standardized</i>	<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Coefficients</i>		
1	(Constant)	782,015	24,168		32,357	,000
	ICT	2,909	2,499	,113	1,164	,248
	Customization	1,090	,181	,586	6,034	,000

a. Dependent Variable: MarketPerf

3. Effect of Adoption of ICT and Customization Capabilities To Financial Performance In Simultaneous and Partial.

Effect of Adoption of ICT and Customization Capabilities To financial performance, simultaneously can be seen from R square values in Table 7, where the value is 0.383. This means that 38.3% change in financial performance is determined by changes in ICT adoption and customization capabilities.

Table 7
Model Summary

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	,619 ^a	,383	,366	161,07615

a. Predictors: (Constant), Customization, ICT

Table 8 shows the F value of 22.981 with 0,000 sig. This shows that the adoption of ICT and customization capabilities simultaneously significant effect on financial performance.

Table 8
ANOVA^b

<i>Model</i>		<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	1192482,809	2	596241,404	22,981	,000 ^a
	Residual	1919969,009	74	25945,527		
	Total	3112451,818	76			

a. Predictors: (Constant), Customization, ICT

b. Dependent Variable: Financial Perf

Table 9 shows the adoption of ICT on financial performance, has a regression coefficient of 23.459 with at-value of 2.915 and 0.005 sig. That is significant at $\alpha=1\%$. It can be concluded, that partially, the adoption of ICT significant positive effect on financial performance.

Table 9
Coefficients^a

<i>Model</i>		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
1	(Constant)	-251,764	77,831		-3,235	,002
	ICT	23,459	8,046	,288	2,915	,005
	Customization	2,634	,582	,448	4,526	,000

a. Dependent Variable: FinancialPerf

Customization capabilities on financial performance has a regression coefficient of 2.634 with *t*-value of 4.526 and 0.000 sig. That is significant at $\alpha=1\%$. It can be concluded, that partially, customization capabilities significant positive effect on financial performance.

4. DISCUSSION

This study has successfully revealed that the adoption of ICT positive and significant effect, on customization capabilities in small and medium scale manufacturing industries. Other results, partially, ICT adoption did not have a significant effect on the performance of marketing. Meanwhile, customization capabilities, significant positive effect on marketing performance.

This result shows that capabilities customization, an intervening variable that connects between the adoption of ICT and marketing performance. That is, the impact of the adoption of ICT on the performance of marketing absolutely must go through the customization capabilities. This is reasonable, considering the manufacturing industry, ICT functioned more as a support in the production process. ICT is not too functioned in support of marketing activities. Therefore, marketing performance is determined more by the customization capabilities, which result from such customization can be felt directly by consumers.

In the other test, ICT adoption and customization capabilities significant effect partially and simultaneously to financial performance. These results indicate that the adoption of ICT plays a major role in improving financial performance. The direct impact is generated through the accuracy, speed, and flexibility offered by ICT, so that financially the company can operate more efficiently. Meanwhile, the direct impact of customization capabilities on financial performance is on the increase in sales volume. Customization capabilities will allow the creation of a strong relationship with the customer, because the customer can more freely make choices in accordance with his wishes. This will increase the volume of sales.

CONCLUSIONS AND RECOMMENDATIONS

We have obtained evidence that the adoption of ICT significant positive effect on the customization capabilities in small and medium scale manufacturing industry in Bekasi. In addition, we also get a clear evidence that the customization capabilities and significant positive effect on the performance of the market, and financial performance. Meanwhile, the adoption of ICT significant positive effect on financial performance. However, no significant effect on the performance of marketing.

However, the adoption of ICT have a positive impact. Therefore were commend that the small and medium scale manufacturing industries is appropriate to provide an adequate budget to adopt ICT to support the process of production and operation of enterprises. With the adoption of ICT companies get several benefits at once, first, customization capabilities will be increased. Customization capability is an intangible resource companies. Second, the performance of the company can boost both performance marketing and financial performance.

References

- Adewoye, J., Ayo CK., Oni AA., Adebisi AA. 2011. The impact of IT Investment on service delivery: a case study of Ladoke Akintola University. *Journal of Emergin Trends in Educational research and policy Study (JETERAPS)*. Vol 2 (1) pp 60-66.
- Bessant, John., dan Joe Tidd. 2011. *Innovation and Entrepreneurship*. Second Edition. John Wiley & Sons, Ltd..
- Budi Hermana. 2008. Mendorongdayasaing di Era Informasidan Globalisasi : pemanfaatan modal intelektualdan TI sebagai basis inovasi di Perusahaan. *Makalah Seminar*. Universitas Gunadarma.
- Chuang, Ta-Tao., Kazuo Nakatani., Duanning Zhou. 2009. An Exploratory Study Of The Extent Of Information Technology Adoption In Smes : An Application Of Upper Echelon Theory. *Journal of Enterprises Information Management*. Vol 22. No. 1 pp 183-196.
- Coletti, Paolo dan Thomas Aichner. 2011. *Mass Customization : An Exploration of European Characteristic*. Springer Briefs in Business.
- Daft, Richard L. 2008. *Management*. Eighth edition. Thomson Learning South Western.
- Dermawan Wibisono. 2006. *Manajemen Kinerja : Konsep, desain dan teknikmeningkatkan and ayasaing perusahaan*. Penerbit Erlangga.
- Forth, John., Geoff Mason. 2004. Information and Communication Technology (ICT) Adoption And Utilitation, Skill Constraints And Firm-Level Performance : Evidence From UK Benchmarking Surveys. *NIESR Discussion Paper* No. 234.
- Freund, Robert J. 2004. *Mass Customization and Multiple Intelligence*. International Conference on Mass Customization and Personalization University of Information Technology and Management 20.-21. April 2004, Rzeszow, Poland.
- Freund, R.J. & M. Piotrowski. 2005. *Intellectual Capital Statement - Made in Germany – Mass Customization*. 3rd Interdisciplinary World Congress on Mass Customization & Personalization. 18-21 September 2005. Hongkong.
- Ghobakhloo, Morteza; Sabouri, Mohammad Sadegh; Hong, Tang Sai; Zulkifli, Norzima. 2011. Information Technology Adoption in Small and Medium-sized Enterprises; An Appraisal of Two Decades Literature. *Interdisciplinary Journal of Research in Business*. Vol. 1, Issue. 7, July 2011 (pp. 53-80).
- Gupta, Praveen. 2004. *Six Sigma Business Scorecard : Creating a comprehensive corporate*

- performance measurement system. McGraw-Hill.
- Heizer, Jay & Barry Render. 2011. *Operations Management*. Global edition. Tenth edition. Pearson.
- Hit, Michael A. R. Duane Ireland., Robert E. Hoskisson. 2001. *Manajemen Strategis. Daya Saing & Globalisasi*. Terjemahan. Penerbit Salemba Empat. Jakarta.
- Huang, Chung-Fah & Sung-Lin Hsueh. 2007. *A Study on the Relationship between Intellectual Capital and Business Performance in the Engineering Consulting Industry : A Path Analysis*. Journal of Civil Engineering and Management, Vol XIII, No 4, 265–271
- Jitpaiboon, Thawatchai, Ramesh Dangol and James Walters. 2009. *The study of cooperative relationships and mass Customization*. Management Research News Vol. 32 No. 9, 2009 pp. 804-815 Emerald Group Publishing Limited
- Kagaari, James RK., John C. Mune., Joseph Mpeera Ntayi. 2010. Performance management practices, Information and communication adoption (ICT) and Managed Performance. *Quality assurance in education*. Vol 18 No 2. Pp 106-125.
- Kaplan, R.S and Norton, D.P. 1992. *The Balanced Scorecard – Measures That Drive Performance*. Harvard Business Review: January-February, Harvard Business School Publishing
- Kaplan, Andreas M., Detlef Schoder., Michael Haenlin. 2007. Factors Influencing The Adoption of Mass Customization: The Impact Of Base Category Consumption Frequency And Need Satisfaction. *The Journal of Product Innovation Management*. Vol 24.Pp 101-116.
- Kleis, Landon., Paul Chwelos, Ronald. V Ramirez., Iain Cockburn. 2010. Information Technology And Intangible Output: The Impact Of IT Investment On Innovation Productivity. *Information System Research*. July 2010.
- Korpelainen, Eija. 2009. Theories of ICT System Implementation And Adoption – A Critical Review. *Working Papers. Departement of Industrial Engineering And Management*. Aalto University.
- Krajewski, Lee. J., Larry P. Ritzman. 1999. *Operation Management. Strategy and analysis*. Fifth edition. Addison Wesley.
- Kristal, Mehmet Murat., Xiaowen Huang & Roger G. Schroeder. 2010. *The Effect of Quality Management on Mass Customization Capability*. International Journal of Operations & Production Management. Vol. 30 No. 9. pp. 900-922. Emerald Group Publishing Limited.
- Kun Liao, Zhongming Ma, Johnny Jiung-Yee Lee, & KeKe. 2011 “Achieving mass customization through trust-driven information sharing: a supplier’s perspective”, Management Research Review Vol. 34 No. 5 pp. 541-552 Emerald Group Publishing Limited.
- Laforet, Sylvie. 2011. A framework of organizational innovation and outcomes in SMEs. *International Journal of Entrepreneurial Behaviour & Research* Vol. 17 No. 4, 2011 pp. 380-408 Emerald Group Publishing Limited.
- Lakhal, Lassa^ad, Federico Pasindan Mohamed Limam. 2006. *Quality management practices and their impact on performance*. International Journal of Quality & Reliability Management Vol. 23 No. 6, 2006 pp. 625-646 Emerald Group Publishing Limited.

- Lucas Jr, Henry C. 1999. *Information Technology and The Productivity Paradox. Assesing the value of Investing in IT*. Oxford University Press.
- Loudon, Kenneth C., Jane P. Loudon. 2005. *Sistem Informasi Manajemen. Mengelola Perusahaan Digital*. Edisidelapan. Terjemahan. Penerbit Andi.
- Li, Minfang., Richard Ye. 1999. Information Technology and Firm performance. *Information Management Journal* No 35.1999.Pp 43-51.
- Lubbe, Sam. 2004. The impact of IT Investment in RSA-Ecommerce SME organization. *Electronic journal of information system evaluation*. Vol. 7 issue 1. Pp 49-56.
- Martinez, Candace A., Chistoher Williams. 2010. National Institutions, Entrepreneurship And Global ICT Adoption : A Cross-Country Test Of Competing Theory. *Journal Of Electronic Commerce Research*. Vol 11 No 1.
- Middleton, Karen L., Kent Byus. 2011. Information And Communication Technology Adoption. And Use In Small And Medium Business. *Management Research Review*. Vol 34 no. 1. Pp 98-110.
- Nahmens, Isabelina. 2007. Mass customization strategies and their relationship to lean production in the home building industry. Dissertation. University of central florida.
- Narayanan.VK. 2001. *Managing Technology And Innovation For Competitive Advantage*. Prentice Hall.
- Ntemana, Tsoenyo Julia., Wole Olatokun. 2012. Analyzing The Influence Of Diffusion Of Innovation Atributes on Lecturers' Attitude Toward Information And Communication Technologies. *An Interdisciplinary Journal On Humans In ICT Environments*. Vol 8(2) 179-197.
- O'Brien, James A., George M. Marakas. 2009. *Management Information Systems*. Ninth Edition. McGraw-Hill International Edition.
- Oh, Lih-Bin., Benjamin Loong Tatt-Ng., Hock Tai Teo. 2005. *IT Portofolio management*. A framework for making strategic IT Investment Decision. pp. 1265-1275.
- Peng, David Xiaosong. 2011. Impact of Information Technology On Mass Customization Capability of Manufacturing Plants. *Journal of Operation And Production Managements*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=176344.
- Peng, David Xiaosong., Roger G. Schroeder., & Rachna Shah. 2011. Competitive priorities, plant improvement and innovation capabilities, and operational Performance : A test of two forms of fit. *International Journal of Operations & Production Management* Vol. 31 No. 5, 2011 pp. 484-510 Emerald Group Publishing Limited.
- Piller, Frank T & Mitchell M Tseng. 2010. *Handbook of Research in Mass Customization and Personalization*. World Scientific.
- Prasad, Acklesh. 2008. Information Technology And Business Value In Developing Economies; A Study of Intangible Benefit of IT Investment in Fiji. *The Electronic Journal Of Information System In Developing Countries*. Vol 34. No 2. Pp 1-11.
- Ramani, Karthik., Robert Cunningham., Srikath Devanathan, Jayanti Subtramaniam., Harshal Patwardhan. 2012. Technology Review of Mass Cuatomization. *Purdue Research Education Center For Information System Engineering*.

- Richardson, Jayson. 2009. Diffusion of Technology Adoption In Cambodia: The Test of A Theory. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)* Vol 5, Issue 3, pp. 157-171.
- Richardson, Vernon J., Robert W Zinud. 2002. The Value relevance of Information technology investment announcement : incorporating industry strategic IT Role. *Proceeding of the Hawaii International Conference on System Science*. 2002.
- Rivai, Veithzal, Detri Karyadkk. 2011. *Corporate Performance Management: dari Teorike Praktik (Solusi Tepatdan Mudah Memajukan Perusahaan dengan Menilai Kinerja Perusahaan)*. Ghalia Indonesia.
- Robbins, Stephen P., & Mary Coulter. 2012. *Management*. Eleventh Edition. Prentice Hall.
- Salvador, Fabrizio, Pablo Martin de Holan and Frank Piller. 2009. *Cracking the Code of Mass Customization*. Published in a revised version in the MIT Sloan Management Review, 2009 (Spring Issue; April 2009)
- Sanchez-Rodriguez, Cristobal, Angel Rafael martinez-Lorente. 2011. Effect of IT and Quality management on Performance. *Industrial Management & Data System*. Vol 111 No 6. pp. 830-848.
- Schroeder, Roger G. Susan Meyer Goldstein, M. Johnny Rungtusanatham. 2011. *Operation Management. Contemporary concepts and Cases*. Fifth edition. Mcgraw-Hill. International edition.
- Silveira, Giovani Jose Caetano da.Flavio Sanson Flogilatto. 2005. Effects of technology adoption on mass customization ability of broad and narrow market firm. *Gestao & Producao*. Vol 12. pp. 347-359 set dez.
- Stewart, Walter., Sheri Coulson., Robert Wilson. 2007. Information technology : When is it worth the investment? *Communication of IIMA*. Vol 1 Issu 3. pp. 119-122.
- Tan, Khong Sin., Siong Choy Chong., Binshan Lin., Uchenna Cyril Eze. (2010). Internet-based ICT adoption among SMEs. *Journal of enterprise information management*. Vol 23 No 1. pp. 27-55.
- Teo, Thomson SH., Yu Jun Pian. 2004. A Model for Web adoption. *Information and management journal*. Vol 41. pp. 457-468.
- Terziovski, M. and Samson, D. 1999. *The link between total quality management practice and organizational performance*. International Journal of Quality & Reliability Management, Vol. 16 No. 3
- Turban, Efraim., Linda Volonino. 2010. *Information Technology For Management, Transforming Organizations In The Digital Economy*. 7th Edition. International Student Version. John Wiley & Sons, Inc.
- Vincent Gaspersz. 2006. *Sistem Manajemen Kinerja Terintegrasi Balance Scorecard dengan Six Sigma untuk Organisasi Bisnisdan Pemerintah*. Edisikeempat. Penerbit PT. Gramedia Pustaka Utama.
- Vilaseca-Requena, Jordi., Joan Torreent-Sellens., Ana Isabelle Jimenez-Zarco. 2007. ICT use in Marketing as Innovation Succes factor. *European Journal of Innovation Management*. Vol 10 No pp. -288.

- Wheelen, Thomas L., J. David Hunger. 2010. *Strategic Management and Business Policy. Achieving Sustainability*. Twelfth edition. Prentice Hall. International edition.
- Wu, Sarah Jinhui, Dongli Zhang, & Roger G. Schroeder. 2011. Customization of Quality Practices: the Impact of Quality Culture. *International Journal of Quality & Reliability Management*. Vol. 28. No. 3. pp 263-279.
- Zhang, Lu., Jinghua Huang. 2009. The review of empirical research on IT investment Announcement on the market value of firm. *International Journal of Business and Management*. Vol 4 no 10. pp. 14-27.
- Zorn, Theodore E., Andrew J. Flanagan, Mirit Devorah Shoham. 2011. Institutional and Non-Institutional Influences on Information and Communication Technology Adoption and Use Among Nonprofit Organization. *Human Communication Research*. 37. 1-33. ISSN 0360-3989.