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Internalizing the Harmonized Quality Supervision to Synchronize Technological and Market Insight in Indonesia's Printing Industry

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ABSTRACT

This research aimed to construct a model of harmonized quality supervision in order to fill the research gap between quality responsibility and production performance. At the beginning, 305 printing manufactures in Indonesia were contacted for the study using a *purposive sampling* technique. To achieve normality of data distribution, 265 respondents were selected to be processed using SEM AMOS. The role of a technological learning capacity held more impact than market dynamic recognition for supporting the successful application of harmonized quality supervision. This was because it had an important role for driving quality management practices. Manager could coordinate to the main related divisions -not only the production one- to involve in the improvement of production quality. Production division should not only obtain production insight especially in technological skill, but also enhance market trend knowledge as a basis to produce high quality products which is suitable to consumer needs. Harmonized quality supervision as the novelty of this study contributed towards enhancing the body of theoretical knowledge of the quality management.

JEL Classification: M11

Keywords: *harmonized quality supervision; technological learning capacity; market dynamic recognition; production performance*

I. INTRODUCTION

Achieving quality production is the goal of quality management to ensure business climate and protect consumer interests (Yeung, Cheng, and Lai, 2005). The industry must fulfill those standards if the product wants to be marketed in the area of jurisdiction, in which both the national and international standards applied (LaHay and Noble, 2001). Companies that seek to improve the quality of its products represent the company's attention to the aspects of satisfaction, such as: functionality, safety, comfortable, and esthetic. There are many factors which determine practices of quality management; they were related to consumer, staff and leadership (Wu, 2015). The main aspects of quality management that influence the production quality are the focus on consumer, quality responsibility and process orientation (Samson and Terziovski, 1999). The deployment of quality management requires some complement factors, such as: technology and knowledge (Prajogo and Sohal, 2006). Companies need these aspects of quality management to convince all divisions to be in the right tract (Zeng, Phan, and Matsui 2015). Application of quality management must pass some stages that spend time and effort so that manager should oversee and control every step (Sun and Ni, 2012).

The responsibility in producing high quality products becomes an important commitment of the company since it is one of company's competitive advantages. This can be achieved through consistency of the production process in a long time (Sun and Ni, 2012). Creating high quality products affect the expectations of the company's success because these efforts can build a product reputation (Kaynak, 2003). Even though creating quality products is not an easy task, the maintaining consistency of the production process quality is even harder. This is because it requires the direction of manager and awareness from all divisions to cooperate across divisions of the company. Manager and staff could enact a shared commitment to accomplish each challenge of mission.

There is a tight bound between the quality responsibility and production performance that gains support from both theoretical and practical sides. Many researchers mention that the experienced production team was able to avoid defective products due to operator error (Kaynak and Hartley, 2005; Prabhu *et al.*, 2000; Wu, 2015). Production employees who are able to use the technology well will deliver the required quality standards products (Kafetzopoulos, Psomas, and Gotzamani, 2015). Cooperation among production employees who knows the standard operating procedure will generate maximum production output. Companies, which often involve employees in a performance improvement training, are better prepared for the pressures of changes in consumer demand (Leonard and McAdam, 2004). It is needed to do some efforts in internalizing the values of quality in manager's socialization process to its employees. This is for obtaining a measurable response in the production results improvement (Sun and Ni, 2012).

There are different opinions regarding to the relationship between quality responsibility and production performance. Companies with complex organizational structure show the inability of quality responsibility that affects production performance (Anderson and Jerman, 1998). This condition is not caused by employees who are lack of experience or technology used but because of the weak coordination between divisions (Yeung, Cheng, and Lai, 2005). A company has some high responsible employees but they do not give so much benefit since some policies to spread positive values do not run

well (McGuinness, and Morgan, 2005). Quality responsibility couldn't impact optimally on companies that have divisions' interest conflict (Lee, and Peccei, 2008). In some cases, the quality orientation from production division is unsuccessful because the finance division does not give a financial support.

The contradiction results of research on the impact of quality responsibility in production performance are interesting to be learnt more. Constructive activities won't get employees' optimal response if the activities are not accepted and supported by all companies divisions (Solis *et al.*, 1998). The implementation of quality commitments need to be escorted by the leaders from all divisions (Switzer and Bourdon, 2011; Zeng, Phan, and Matsui, 2015). This coordination needs parties' engagement, share information, and support activities from all. This coordination will be effective if leaders can actively take over direction and take immediate action for the needed-solution.

Responding to cover the desired product, company needs to define which area of marketing that is important to be understood by operation division. Experts agree that technological learning as part of operation management is a prerequisite for companies to improve processes and organizational output (Mikalef and Pateli, 2017; Sánchez-Rodríguez and Martínez-Lorente, 2011). Moreover, companies couldn't learn some technological skills well if they do not have any power to create competitive advantage (McGuinness and Morgan, 2005). Technological learning capacity is closely related to the ability of innovation, continuous improvement, and product quality improvement. On the other side, the consumer-oriented company stresses out the understanding of market dynamic. Even though each section has a different function, but they have the same goal; it is how to achieve a certain level of sales. A common goal drives every part to improve the quality of its work so that the customer satisfaction can be achieved (McGuinness and Morgan, 2005; Mehra and Coleman, 2016). This concept also applies to the operation part since its main function is to produce products that meet the aspects of productivity and customer preferences.

Printing Industry in Indonesia has decreased its profit rate (Tetsu 2013). However, the growth of its business in the last three-year is increasing (KPMG, 2016). The numbers of SMEs' which join the business are escalated quickly every year due to the increasing demand. As a result of competition, many companies are lowering their prices with the consequence to reduced their product quality (Herdian, 2014). If this condition is abandoned, there will be consumer dissatisfaction that will effect on lower sale numbers. This study seeks to provide input to the printing business people so that they can get more attention to the quality production in order to avoid the defective products. If the product attributes can fulfill customer wants, the company can maintain customer loyalty, increase sales and improve profits.

The main objectives of research are to develop a quality process internalization model through testing relationships between important variables of both operation and marketing aspects. It will be tested to define how important the role of harmonized quality supervision, as the novelty of this study, in mediating the relationship between quality commitment and production performance. The model could also identify the important role of market recognition for operation division in implementing quality activities. Lastly, some recommendations will be provided for developing the printing industry.

II. LITERATURE REVIEW

A. Harmonized Quality Supervision and Production Performance

An effort to fulfill production quality achievement requires commitment from all parts of the company. Companies need to create linking mechanism from production division to others so that the involvements of the other divisions are not regarded as an intervention but as coordination. In accordance with ISO 9001, quality fulfillment process is the responsibility of all organization divisions, companies need to create a job description for each division and determine how far the interaction between them to achieve the company's performance (Prabhu *et al.*, 2000, Prajogo, Huo, and Han, 2012). Issues from production division, such as: the raw material supply sustainability, the completion of production schedule, and the achievement of product attributes, are regarded not merely a burden for production, but it is a communal business plan that need support from all parties.

Harmonized quality supervision is defined as activities in coordinating production progress information and enhancing the engagement from every part of the organization to achieve its determined product attributes. Even though the smoothness of production is the responsibility of production division, but production performance can be achieved optimally if there is cooperation among production division with other division, from finance, marketing and human resources division (Leonard and McAdam, 2004). Management needs to share production information to other divisions so that each part is able to prepare and determine the activities that support the production productivity achievement (Lee and Peccei 2008). In addition, management needs to design the interaction of production division and others that the crucial issues in production can be solved together (Sun and Ni, 2012).

Harmonized quality supervision is synthesized from several theories: quality management and strategic management. Theory of quality management emphasizes the company to improve the quality of processes and products on an ongoing basis as a form of responsibility to related parties like employees, consumers and shareholders (Mehra and Coleman, 2016). There are core activities of quality management that the company should design, such as: continuous improvement, customer satisfaction focus and prevention of nonconformance (Bhatia and Awasthi, 2018). The concept of continuous improvement explains the company's efforts to improve the working method in stages so that the improvement does not interfere the strategic planning in long-term. Strategic management discusses how firms determine business strategies that synchronize external environment changes with company’s internal resources (Yunis, Jung, and Chen, 2013). Companies should undertake the supervision of important internal components, such as: employees, technology, products and capital to achieve the company's vision, mission and objectives (Wu, 2015). Based on that idea, the concept of harmonized quality supervision explores how large companies manage the strengths and weaknesses of internal resources to improve the quality of activities especially in production division.

Companies need to manage information within all divisions about the development of production quality achievement. The activities should be not only as a form of supervision but also encourage the active participation from all divisions of the enterprise (Lee and Peccei, 2008). The Company may hold regular meetings to discuss the progress of the production. If the production process overcomes very complex

problems, management can involve others to discuss solutions together (Yeung, Cheng, and Lai, 2005). Activities focused on the sharing production information, such as: progress of production, fulfillment of product quality, and design changes, can be supported with information technology so that strategic decisions can be done immediately (Kaynak, 2003). On high valued project, company can create a task force by involving representatives from each division to maximize the completion of the task.

The coordination, which discus on the increasing excellence attributes in the production process that involves whole company's division, needs to be done regularly. The main problem overcome from order-based producing manufacture is the delivering products that suit customer in terms of quality assurance, the exact quantity, and timeline (Phan, Abdallah, and Matsui, 2011; Zeng, Phan, and Matsui, 2015). The regular additional meetings will help to evaluate the achievement of production process quality and also help to avoid misunderstandings and facilitate cooperation from all divisions. Therefore, the evaluation by forming representatives from all company's division leaders will direct the objectives and targets well (Prabhu *et al.*, 2000). Conflicts of interest in the coordination process are possible, so a technical guidance on achieving quality production needs to be emphasized.

Production performance is the achievement level of production process output. Production performance can be seen from how much the achievement of product attributes (Trentin, Perin, and Forza, 2012). The production process complies the industry standards produces a good quality product. Production performance can also be measured by how many products can be categorized as a good product (Ilkay and Aslan, 2012). If production division only produces few defective products, the production process can be continued. On the other hand, if the production division produces excessive number of defective products, the company should evaluate the problem and find solutions (Switzer and Bourdon, 2011).

The order-based producing company can observe the quality of production based on the extent to which production division completes the order schedule. The production quality is not solely be seen from how many products meet the quality, but also how the proper completion of the product should be (Trentin, Perin, and Forza, 2012). If the company can undergo innovation in production, the production engineering system can be done to meet the production schedule. Production performance discussion in complete should talk about the ability of production division to produce good quality products, reducing the defective products, and fulfilling the production schedule that meet the number and delivery time to customer (Kaynak, 2003).

The company's ability to manage the involvement of company's divisions affects production performance. Production problems are not always because of the suboptimal production employee's work (Sánchez-Rodríguez and Martínez-Lorente, 2011). The solution to this problem can often be solved with the support from other divisions. The inability of production to produce quality products in accordance with customer expectations can be determined from the feedback from marketing department which knows better the consumer preferences (Prajogo and Sohal, 2006). Completion of product orders in large amounts and complex specification need intensively coordination among all divisions (Solis *et al.*, 1998). It is getting more urgent when there is a tight finishing schedule. Those orders will hopefully be finished if the cooperation among divisions is solid.

Improved coordination among companies divisions reduces the damage products potential. Damaged products can be minimized through continuous improvement of production processes (Kaynak and Hartley, 2005; Sánchez-Rodríguez and Martínez-Lorente, 2011). Production errors caused by little support information from another divisions can be avoided if there were intensive coordination (Fang, Li, and Lu, 2016). If these efforts require the authority of certain division; then, the production division can explain what kind of support is required (Phan, Abdallah, and Matsui, 2011; Wu, 2015). Basically, there are three types of support that may be given from other divisions, they are:, information support (Sánchez-Rodríguez and Martínez-Lorente 2011), employee (Kaynak and Hartley, 2005), or finance (Lee and Peccei, 2008). Through these supports, companies can preventively and curatively take steps in improving the production process. These explanations can be hypothesized as follows:

H_1: The more harmonized quality supervision a company has, the greater production performance will be.

B. Quality Responsibility

Activities that are impactful to the excellent companies' characteristics achievement can be sustained if the commitment to quality has become a work culture (Lemmink, 1996). Before employees are doing positive activities, company's leader has initiated to epitomize (Solis *et al.*, 1998). Various messages about the importance of applying quality in company's strategic places are needed to remind the importance of honoring the activity process achievement. Employees who make mistakes or did not complete the work in accordance with the level of certain work ethic should be willing to accept suggestions for improvements from the leaders or fellow employees with equanimity (Sun and Ni, 2012). The company is willing to benchmark with similar companies on the application of certain work quality to achieve the expected quality standards.

Quality responsibility is defined as an organizational awareness to the implementation of activities that encourage achievement of designated company's production attributes. Quality consciousness arises because of the internal impetus for achieving the efficiency and productivity of production (Bhatia and Awasthi, 2018; Yunis, Jung, and Chen, 2013). This production system is capable in supporting the achievement of cost leadership through the minimization of production costs (Lee and Peccei, 2008). Quality awareness could also arise because of the forcing consumers desired who require goods or services they consume to be fulfilled in certain quality (Prabhu *et al.*, 2000). Companies can evaluate the achievement of production attributes to determine the performance of each indicator. If it is necessary, company may change the standards to achieve each attribute to meet the requirements of the market needs.

Understanding on the attributes of product excellence is a form of corporate concern about product quality. There are two words that are important in maintaining the business: adaptation (Leonard and McAdam, 2004) and changing (Wu, 2015) . Companies are excelling if it is able to capture signals shift in consumer preferences and do any form of adjustment (Setiawan and Hanfan, 2017). Moreover, companies can learn from the competitors about how far the intensity of such adjustments is made (Yeung, Cheng, and Lai, 2005). Adjustment understanding of product quality can also be done by responding to the desires of consumers and the development of competition. The

production division can request the help of the marketing division to collect such strategic information.

Companies can manage the training program as part of quality commitment on an ongoing basis through the transfer of knowledge from a particular company structure to the structure below. Risks of new technology implementation can be anticipated through the process of socialization (Bhatia and Awasthi, 2018). The improper use of technology not only results in damage to companies' facilities but also weighed on the cost of production (Wu, 2015). One of the new technologies is a process of socialization through various training, such as: the selection of raw materials, controlling production processes, and sorting failed product (Mehra and Coleman, 2016). Socialization of new technology also reduces the resistance behavior of employees who feel that their potential advantages are not able to adjust to the new policies. Various forms of training are not seen as only company's financial expenditure, but it becomes an investment to anticipate future changes (Lee and Peccei, 2008).

Companies that have responsibility for the implementation of production quality seek to involve the internal parts to synchronize their important role from each division. The production quality is a derivative of company's quality in general which is usually in the objective of strategic level meeting delivered by top managers (Solis *et al.*, 1998; Wu, 2015; Yunis, Jung, and Chen, 2013). In spite of each has a different derivative management functioned objectives, there is a close correlation among divisions (Wu, Zhang, and Schroeder, 2011). As a simple example, the purpose of production department to produce product attributes require financial certainty in sustainability procurement efforts for quality raw materials, in which this issue also relates to the financial division (Lee and Peccei, 2008). Therefore, it cannot be denied that the awareness of production in achieving quality production requires the intervention of top-level managers to involve in all divisions. This argument is encouraging the following hypothesis:

H_2: The more quality responsibility a company has, the greater harmonized quality supervision will be.

The production department has a liability in achieving production quality that has been established by companies. Product attributes specified by the customer will be easier to be achieved if the company has the correct instructions to produce them (Phan, Abdallah, and Matsui, 2011; Sun and Ni, 2012; Switzer and Bourdon, 2011). Various damage products can be avoided by monitoring the quality in each stage of production starting from raw material control, strictly production process supervision, and final product inspection (Kafetzopoulos, Psomas, and Gotzamani, 2015). Companies that have a high-quality culture emphasizes each division in the production process to be independently responsible for the quality output produced (Jung *et al.*, 2008; Wu, 2015). Each division should avoid flaw input, imperfect process, and not optimal quality output (Laszlo, 1999). Theoretical and practical support for the explanation is mentioned into the following hypothesis:

H_3: The more quality responsibility of a company, the greater the production performance will be.

C. Technological Learning Capacity

Companies should implement various smart strategies to get through each stage of the business lifecycle. It should be in various stages, starting from the introduction, development, maturing and declining. The future introduction is the most challenging time for the company to coordinate their internal resources that have not been managed well to face the stiff competition environment (Bolívar-Ramos, García-Morales, and García-Sánchez, 2012). Companies that are not able to synchronize their main division will face the risk of failure. Meanwhile, companies which are able to collaborate on internal resources are still to be tested for their ability against all threats from environmental companies, such as: the competitor pressure, changes in consumer tastes, limited supply, and overtaken technology. The important thing for the company is not to avoid the appearance of any pressure but how to overcome and deal with them in every stage of business life cycle.

Companies should increase the technological capacity to develop self-learning and confront all challenges. Technological learning capacity is the ability to accept, understand, and utilize technology that has never been used before to improve enterprise business processes which are reflected in the main function of management: marketing, production, resources, and finance (Bhatia and Awasthi, 2018). Companies that have a solid team and adaptive character have the ability to learn new technologies (Prajogo and Sohal, 2006). The team was able to predict production technology that will affect company's competitive advantage. Companies can rehearse core teams to accelerate the adoption and internalization of new technologies.

Anticipating the demands of new production technologies application, companies need to learn production process method to be more efficient. Companies are able to achieve production efficiency with the appropriate technology which can achieve cost advantages (Kitapçi and Çelik, 2014). Despite these technologies require additional investment that cost the company but in general the cost of product will decrease if the company is able to achieve a certain production capacity. Therefore, corporate manager need to evaluate the extent current productivity of production systems. In addition, they are always open to the development of technologies that support improved production.

Adoption of new production methods requires technological and organizational readiness. The presence of new technologies that are expected to improve the performance of production cannot be achieved if the company did not immediately implement the technology (McGuinness and Morgan, 2005). The delay is caused by the inability of company which does not have a team to operate the new technology. The application of new method is also often not able to be applied properly because there is a part of company’s structure that does not accept the technology wholeheartedly (Bhatia and Awasthi, 2018). The resistance attitude arises because they feel threatened by the presence of new technologies. Companies need to conduct training to introduce and operate gradually the technology on management parts that are responsible to the technology implementation.

Companies are able to master the new technologies in the form of new methods and tools needs to encourage their managers and employees to engage in improving the quality of production (Trentin, Perin, and Forza, 2012). The new technology contains the complexity of larger features than the previous one. The application of new production technologies requires more detailed information for the production process so that it will

produce better output quality (Bolívar-Ramos, García-Morales, and García-Sánchez, 2012). To cover the completeness of information, resources may not be obtained from a single division but from several divisions of the company. Through coordination between divisions, certain production quality targets can be achieved. National company that has various divisions, such as: marketing, human resources, finance, and production division will integrate role from all divisions to select and implement appropriate new technologies in order to achieve improvement quality performance of the company (Phan, Abdallah, and Matsui, 2011). Based on these considerations, the hypothesis that a very relevant is:

H_4: The more technology learning capacity of a company, the greater the harmonized quality supervision will be.

Companies that are able to master a variety of relevant technologies to business have the awareness to improve production processes and produce higher quality products. It is perceived new technologies as a medium that has greater advantaging features than the previous technology. The use of new technologies intended to gain a lot of benefit such as the achievement of better production quality than the practices of existing production (Perez-arostegui and Barrales-molina, 2015). Skills to use various technologies makes the experts realize that they are able to produce better goods than before (Prajogo and Sohal, 2006). This empirical reality has prompted the following relationship:

H_5: The more technology capacity of a company, the greater the quality responsibility will be.

D. Market Dynamic Recognition

The successful launch of new products is determined by the important attributes of these products to meet consumer preferences. A product created based on two major considerations, namely the pull of companies' technology and encouragement of market needs (Pavlou, 2004; Zeng, Phan, and Chen, 2015). In spite of each product is designed based on technological developments and characteristics of target consumer, the production process with consumer orientation will ensure the new products in market (Wankhade and Dabade, 2007). Before the product is made, the manufacturer through marketing research should find out what customers expect. Information on consumers from marketing department becomes the input for the production division to determine the specifications of product to meet the target market.

Market dynamic recognition is the company's ability to follow and respond to the development of business related to the changes of core activities in the environment, such as consumer tastes, supplier policies, and strategies of competitors (Mehra and Coleman, 2016). Understanding the market dynamics is about concerning all constituents in business environment that influences company policy (LaHay and Noble, 2001). Companies not only need to understand the development of consumer taste but also follow the movements of competitors who seek to undermine the market share of the company (McGuinness and Morgan, 2005). Understanding the market dynamics also requires companies to understand the behavior of suppliers to ensure the availability of

raw material supply. Despite this dynamic market activity recognition, the order-based business can be focused on the company's ability to understand the very specific consumers' desire.

Companies that care about their product success sought information about consumer expectations in product quality. Each product should have certain characteristics to reach the quality standards specified by the industry that has been determined by the certified institution (Yeung, Cheng, and Lai, 2005). Sometimes, there are products made based on customer's request. Companies need to synchronize between industry certification requirements with the consumer preference to be accepted in the market (Phan, Abdallah, and Matsui, 2011; Setiawan and Hanfan, 2017). Companies need to expand their knowledge about the product quality required development related to the materials, processes and finishing of products. This information can be obtained directly through intensive communication with the target consumer. Companies can also independently 'dig' this knowledge through online or offline exploration.

The ability to set priorities of customer's preferences in production planning will affect the success of a product launch. Consumers have the unique preferences to the order important attribute (Pavlou, 2004). According to business experience that the company has been dealing with, the production manager should have general instructions regarding to the priority level of the various characteristics of the products that consumers want. Attributes of printed goods should have certain characteristics, such as: the quality of the writing, the binding power, and the neatness of print size. The quality can be achieved through appropriate procurement of raw materials, strict supervision, and control of the printing process carefully.

Companies should respond to the change of consumer preference development to meet the trends (McGuinness and Morgan, 2005). Businesses that contain elements such as printing technology and art are very dynamic because the quality level is developed following the advances of technology and consumer preference changes. Companies should prepare to adjust all the changes through the increasing skills of employees and the use of new technologies (Wu, 2015). Speed in responding to market becomes the competitive strength of companies because consumers will prefer a company that is more adaptive to new trends. In level of characteristics that the company is able to adjust are also considered by consumers. In the end, consumers prefer companies that are able to respond to all desires quickly. This thought became the basis for determining hypothesis as follows:

H_6: The more market dynamic recognition of a company, the greater the quality responsibility will be.

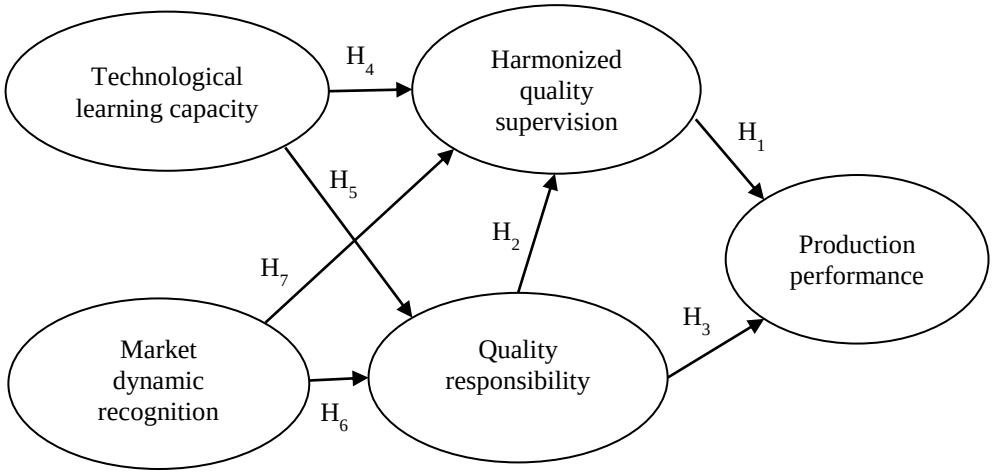
Companies which are able to understand the development customer needs have greater coordination in producing a quality product (Kafetzopoulos, Psomas, and Gotzamani, 2015). The company needs to have a customer satisfaction orientation because they will be more aware to the products produced to satisfy consumer (Wankhade and Dabade, 2007). Production managers strive to produce products with the specifications provided by customers. Production employees will control the production process so that the product quality is in line with the expectations. The awareness of understanding customer encourages company's leaders to internalize constructive policy

to all divisions to have responsibility for producing quality products. This thought became the basis for determining hypothesis below:

H_7: The more market dynamic recognition of a company, the greater harmonized quality supervision will be.

Based on these empirical and theoretical considerations, the research model can be built in their entirety. Relationships between variables were developed based on previous research. The model is built based on the stages of production, namely input, process, and output. Variables that serve as the input are technological learning capacity and market dynamic recognition. Variable that acts as the process is the quality responsibility and harmonized quality supervision. While the variable that acts as the output is the production performance. Detailed models can be seen in Figure 1.

Figure 1
Research model



III. METHODOLOGY

A. Respondents

Respondents of this research are printing companies located in major cities in Central Java, Indonesia, such as: Semarang, Surakarta, Purwokerto and Yogyakarta. These areas also have many universities so that the development of printing business can support the educational needs rapidly. Printing business competition is also getting tougher because the entry barrier of this business is small. Some printing companies are not able to survive because they cannot operate efficiently. The respondents who are asked to fulfill the questionnaire are the production manager or general director.

Based on data from the Department of Industry and trade (*Disperindag*) Central Java and Yogyakarta, Indonesia, there are 1,950 scattered printing companies in Central

Java major cities. Each printing company's identity is seen through its sustainability, operational address, and contact (telephone, post mail or email). Initially, the samples are 305 companies. It is considered by the representative number of population and the data ability to be processed with SEM AMOS. Respondents are determined by *purposive sampling* technique by considering several criteria, such as: there are at least two divisions in the company (the production division should be one of them) and has been operating for three years.

B. Data Validity and Normalization

The initial processing of the 305 respondents indicated the incompleteness and potential abnormalities data. There were 15 questionnaires which were not completely replied, so those had to be eliminated from further process. The screening and trimming tests which identify inconsistencies and separate answers of 13 respondents cannot be processed at a later stage. Through early processing with AMOS, some data appeared to have normally undistributed. It was represented by the value of c.r skewness and c.r. kurtosis which were <- 2.548 or > +2.548. Therefore, 12 respondents were eliminated for Mahanalobis values.

At the end, there were 265 data to be proceeded. It met the criteria of normal data distribution which was categorized based on the univariate normality and multivariate normality values at required rate. It is at value c.r. – 2.548 <normality <+ 2.548 (Table 1). The value of c.r skewness for these indicators was at intervals of -2.504 up to 1.104 while the value of c.r kurtosis in these indicators was on a range -0.983 up to 2.536. Multivariate normality of all data showed that the c.r is 1.935 convincing. 265 respondents were the final data to be analyzed in descriptive and inductive statistics.

C. Construct Validity

Indicators of variables refer to the strong theoretical and empirical arguments (Table 1). Each indicator has been statistically proven have met the loading factor above 0.7. In addition, it generates a cumulative contribution to the variables explain by Cronbach-α above 0.7. The loading factor obtained by using SEM AMOS. Cronbach- α of harmonized quality supervision has four indicators, they are quality commitment throughout the company, sharing information on the development of quality, linking the development of production quality and engagement with other divisions throughout the company in improving production quality (Leonard and McAdam, 2004; Prabhu *et al.*, 2000; Prajogo, Huo, and Han, 2012). The smallest loading factor score of harmonized quality supervision is 0.71 with Cronbach-α 0.784.

Quality responsibility has three valid indicators; there are company's understanding of product quality, the implementation of culture excellence in the production process, and the product quality improvement process (Phan, Abdallah, and Matsui, 2011; Solis *et al.*, 1998; Sun and Ni, 2012). The loading factor value of quality responsibility ranged from 0.70 up to 0.88 which shows the ability of indicators to explain the quality responsibility variable. These conditions are supported by Cronbach-α value which is 0.774.

Table 1
Construct validity

Variable Indicators	Skewness	Cr skewness	Kurtosis	Cr kurtosis	Factor Loading	α-Cronbach
Harmonized quality supervision						0.784
• Quality commitment of all parts of organization	-0.076	-0.420	0.063	0.172	0.70	
• Information sharing of quality improvement	-0.122	-0.674	-0.318	-0.875	0.75	
• Relating the development of production process quality with the other parts of companies	-0.217	-1.193	-0.312	-0.859	0.71	
• Involving all parts of companies in enhancing production process quality	-0.014	-0.075	-0.357	-0.983	0.71	
Quality responsibility						0.774
• Understanding Product quality	0.142	0.784	0.921	2.536	0.89	
• Applying the culture of excellent production process quality	-0.169	-0.932	0.919	2.531	0.82	
• Training of enhancing production process quality	-0.060	-0.330	0.431	1.186	0.70	
Technological learning capability						0.873
• Learning new technology	-0.093	-0.515	0.402	1.106	0.89	
• Well-utilizing new method	-0.177	-0.977	0.844	2.325	0.89	
• Applying new means	-0.354	-1.950	0.464	1.276	0.86	
Market dynamic recognition						0.792
• Ascertaining product attribute from customer	0.060	0.328	0.800	2.202	0.83	
• Determining the priority of product attribute from customer	0.200	1.104	0.486	1.339	0.75	
• Responding the changing of customer preferences	0.008	0.041	0.694	1.910	0.87	
Production performance						0.892
• Declining level of broken product	-0.429	-2.363	0.437	1.204	0.90	
• Suitability of order quantity in production part	-0.441	-2.427	0.476	1.312	0.88	
• Fulfilling of order quality in production part	-0.455	-2.504	0.428	1.178	0.84	
Multivariate normality			6.881	1.934		

Technological learning capability is characterized by three indicators: the ability to learn new technologies, using the new method and implement new tools (Perez-arostegui and Barrales-molina, 2015; Trentin *et al.*, 2012). The smallest loading factor value of technological learning capacity is 0.86.This means all indicators have good explanatory power with a value of Cronbach-α 0.873. Market dynamic recognition explained by some indicators, they are the company's knowledge about product attributes that consumers want, the priority of product attribute preferences, and the level of the company's response to change in consumer tastes (Wankhade and Dabade, 2007; Setiawan and Hanfan, 2017). The loading factor for Market dynamic recognition ranged from 0.75 to 0.87 which confirms the high validity. The Cronbach-α value is 0792.

There are a number of indicators for production performance, these are a decreasing number of defective products, the fulfillment of order quantity and it suitability of attribute products (Pavlou, 2004; Yeung, Cheng, and Lai, 2005). The

loading factor for production performance is very high. It ranges from 0.8 up to 0.9 with 0.892 for the Cronbach-α.

IV. ANALYSIS

A. Structural Model Analysis

Goodness of fit parameter shows that the model is able to describe the phenomenon of companies' behavior in internalizing the quality values (Table 2). There are parameters that convince models, such as: the chi-square value which was relatively low at 137.156, probability = 0.005, GFI = 0.905, AGFI = 0867 (marginal) and RMSEA = 0048. Nevertheless, there is a goodness of fit parameters that does not supported, they are TLI = 0.708, CFI = 0.765 and Hoelter = 175. A perfect model requires TLI and CFI values above 0.9. While the required value for Hoelter is above the number of respondents which is 265. The model was accepted as the final model since five from eight parameters of goodness of fit are supported.

Table 2
Output of structural model

No		Structural relationship	Regression weight	P	Consequence
1	Harmonized quality supervision	Production performance	0.516	0.000	H_1 supported
2	Quality responsibility	Harmonized quality supervision	0.232	0.029	H_2 supported
3	Quality responsibility	Production performance	0.337	0.005	H_3 supported
4	Technological learning capacity	Harmonized quality supervision	0.568	0.000	H_4 supported
5	Technological learning capacity	Quality responsibility	0.433	0.000	H_5 supported
6	Market dynamic recognition	Quality responsibility	0.323	0.002	H_6 supported
7	Market dynamic recognition	Harmonized quality supervision	0.087	0.392	H_7 not supported

Note: chi-square =119.406, p=0.053, AGFI=0.920, GFI=0.943, TLI=0.896, CFI=0.917, RMSEA= 0.030, Hoelter=290

The regression coefficient between the harmonized quality supervision and production performance has a value of 0.516 with p = 0.000 which shows a significant relationship (Table 2). This conclusion is in line with the results of previous research. Companies which other divisions can help the production division produces better production performance (Prabhu *et al.*, 2000). The manager is able to push the marketing and human resources divisions to monitor the progress of customer orders achievement. The involvement of marketing in designing product quality can be in the form of information sharing about the advance competitor's product characteristics in facing the customer preference changing (Wu, 2015). In addition, the human resource development

can use its authority to help finishing customer orders like adding more employees, production skill training, and adding over time employees' incentive to finish the deadline. This supports the acceptance of hypothesis 1 about a close relationship between the harmonized quality supervision and production performance.

The regression coefficient between quality responsibility and harmonized quality supervision shows a relatively small number; it is 0.232. However, the significance value is 0.002. This meets the requirements values (below 0.10). This value stresses that hypothesis 2 explaining the intensity of activities related to improving quality responsibility attempts to involve in company's important part to meet the production completion. This is in line with the conclusions of several studies on the internalization of quality that highlights the importance of the leaders' level meeting to oversee the implementation process quality socialization (Lee and Peccei, 2008; Solis *et al.*, 1998; Wu, 2015). Companies that have a higher structure of hierarchy decision need more efforts to coordinate among departments.

The relationships between quality responsibility and production performance have the regression coefficient value of 0.337 at p = 0.005, the p-value is lower than what is required (0.1). This value indicates significant relationship between the two that the culture of quality has become a company's habit to guarantee the fulfillment of production attributes (Solis *et al.*, 1998; Zeng, Phan, and Matsui, 2015). These results is similar with previous research saying that quality commitment automatically increase the awareness of production performance quality (Kaynak and Hartley, 2005; Prabhu *et al.*, 2000). In the context of printing industry which needs rapid work in fulfilling orders, small and medium scale enterprises may face difficult situation, such as: uncertain material supply and the limited employees' skills. If the company is able to overcome with these constraints, the work plan could be achieved.

Regression coefficient value of technological learning capacity with harmonized quality supervision are at 0.568 with p = 0.000. This condition confirms that the company's ability to learn new technology encourages them to manage the traffic information and coordination in resolving the production orders schedule (Bolívar-Ramos, García-Morales, and García-Sánchez, 2012; Trentin, Perin, and Forza, 2012). These results are also supported by previous research saying that companies which could adapt to new technologies are easier to assimilate in achieving common objectives, including the fulfillment of production excellence attributes (Fang, Li, and Lu, 2016; Bolívar-Ramos, García-Morales, and García-Sánchez, 2012). This condition is more pronounced in industries facing rapidly development in industrial technologies, like the printing industry rather than the industry that were moderated in facing technological demands (Herdian, 2014). This condition leads to the conclusion which the hypothesis 4 states that there is a significant relationship between technological learning capacity and harmonized quality supervision.

Significant relationship was also shown between technological learning capacity and quality responsibility, which both regression coefficient values are 0.568 with p = 0.000. These results are supported by previous studies which stated that the company which is able to master a new technology will be more aware to the importance of quality in the production process (McGuinness and Morgan, 2005). The term technology does not always refer to the complex and costly hardware; it is also about the knowledge and skills in understanding technology in general. Companies, which acquire knowledge about the importance of working quality, implement activities that maintain the

company's value quality (Perez-Arostegui and Barrales-Molina, 2015; Yunis, Jung, and Chen, 2013). It is also in line with the concept of a technological learning curve which stated the more intense the company learns the technology, the greater capitalization benefit they can exploit. Based on these facts, hypothesis 5 saying about the relationship between technological learning capacity and quality responsibility is accepted.

The relationship between market dynamic recognition and quality responsibility has high-value significance with a regression coefficient is 0.323 at p = 0.002. Their relationship is already supported by the results of previous studies that companies which understand the changing tastes of consumers have the awareness to follow the preference attributes (McGuinness and Morgan, 2005). Despite, following the market trend has the consequence to prepare the employees skill and the appropriate production technology, but companies should be aware of the philosophy of change and adaptation (Wankhade and Dabade, 2007). The Company can withstand the competition if it perceives change as the part of life cycle and adaptability as a consequence of change acceptance readiness. This argument confirms the acceptance of hypothesis 6 about a close connection between dynamic market recognition and quality responsibility.

The last test of relationship is between market dynamic recognition and harmonized quality supervision. It showed the insignificant relationship with regression coefficient 0.087 at p=0.392. Understanding the operation division on marketing aspect is not necessarily able to synchronize with the production aspect. It is because the market knowledge is positioned as the initial media that has not been applied in production practices. Companies will have difficulties to share the development of production if they only master some product attributes of customer preferences (Phan, Abdallah, and Matsui, 2011). However, market understanding has benefits if company is able to transform it into quality responsibility (hypothesis 2) so that market knowledge has become a real activity in producing goods.

B. Pathway Analysis

There are various ways to improve the operation performance based on the intermediation effect of each path (Table 3). Pathway 1 has the largest intermediation effect (0.023) in which to improve the company's production performance, it should pass technological learning capability and harmonized quality supervision. Pathway 1 also has the greatest impact. The next pathway also passes 2 intervening variables; they are technological learning capability and quality responsibility with the 0.011 intermediation effect. Pathway 3 is still passing through the technological learning capability in which to achieve the company's operation performance it should improve quality responsibility and harmonize quality supervision. Pathway 4 and pathway 5 always face the same effort to how improve the operation performance through market dynamic recognition and quality responsibility. Pathway 4 has a shorter intervening variable than pathway 5 because it does not need to pass harmonized quality supervision. However, intermediation effect in pathway 4 is greater than pathway 5 (0.004> 0.001).

Efforts to improve production performance are most effective if the company is able to optimize the activities of harmonized quality supervision. Pathways that have a

Table 3
Intermediation effect to improve production performance

No	Pathway to improve operation performance							Direct effect value			Intermediation effect
								1	2	3	
1	Technological learning capability	→ (1)	Harmonized quality supervision	→ (2)	Production performance			0.568	0.516		0.023
2	Technological learning capability	→ (1)	Quality responsibility	→ (2)	Production performance			0.433	0.337		0.011
3	Technological learning capability	→ (1)	Quality responsibility	→ (2)	Harmonized quality supervision	→ (3)	Production performance	0.433	0.232	0.516	0.006
4	Market dynamic recognition	→ (1)	Quality responsibility	→ (2)	Production performance			0.323	0.337		0.004
5	Market dynamic recognition	→ (1)	Quality responsibility	→ (2)	Harmonized quality supervision	→ (3)	Production performance	0.323	0.232	0.516	0.001

tremendous impact are found in pathway 1 through which harmonized quality supervision is passed because the shortest pathway also has the highest intermediation effect. From five pathway improvements in production performance, three of which always pass a harmonized quality supervision that shows how important this variable is (Pathway 1, pathway 3 and pathway 5).

Increased production performance provides more effective impact if the company passes technological learning capability. In the short pathway (pathway 1, pathway 2 and pathway 4) the impact of increased operation performance is dominated through technical analytical learning capability rather than market dynamic recognition. Similarly, the efforts to improve operation performance where there are more than two intervening variables (pathway 3 and pathway 5), is more effective if the company passes technological learning capability from market dynamic recognition.

V. OUTPUT AND IMPLICATION

A. Discussion

The research model has been able to describe the phenomenon of the implementation of quality processes in order-based companies. The application of quality management requires the company's internal capabilities in using technology and understanding the market trends. Companies should have the power to respond to the development of adaptive technology through improving production stages and using the latest production tools (Wu, 2015). Analysis of technologies that have long-term effects needs to be taken to choose the right technology and to encourage the improvement of the quality production process (Bhatia and Awasthi, 2018). The production department should not only master the production methods, but also follow the tastes of the consumer so that the product attributes meet customer preferences. They can also actively discuss with marketing division about customer preferences. The spirit that should be emphasized in the production is to create product attributes that meet market dynamic (Yunis, Jung, and Chen, 2013).

Production division of manufactures in Indonesia emphasizes technology mastery rather than market understanding. Operation division usually consists of employees who are more familiar with technical aspects than the understanding of market behavior (Mehra and Coleman, 2016). This condition indicates that they are very focused on the tasks like mastery of new production tools, the implementation of new production system, and the use of new machines. The fact also proves that the greater attention to these production aspects is significantly more impactful than their understanding of consumer shifts. However, it does not mean that they do not need to understand market conditions because in fact both technological and market understanding are needed in different levels. The understanding of production staff on market developments is necessary but this knowledge is an additional requirement and not a key requirement (Wu, 2015). This market knowledge becomes meaningful if it is able to form production employees who have a responsibility to the quality of products and processes.

Harmonized quality supervision as the novelty of this study possessed a significant role in triggering the role of quality responsibility. Quality responsibility does not have the power to affect production performance. Despite this position of quality responsibility is very pronounced if the companies enable harmonized quality supervision role that

serves as a full mediation (Phan, Abdallah, and Matsui, 2011). Companies that seek to achieve production performance should be aware that the awareness of employees about the tasks of production cannot guarantee to reach the production performance. Companies need to coordinate the production division with the other divisions so that the problems can be fully supported by the production division and production constraints that arise can be resolved quickly (Wu, 2015).

Harmonized quality supervision has a strong role in ferrying antecedent variables to achieve production performance. Based on the relationship between significant variables, production performance improvement can take three paths. The first path is through technological learning capacity → harmonized quality supervision → production performance. The second path is technological learning capacity → quality responsibility → harmonized quality supervision → production performance. The third path is through market dynamic recognition → quality responsibility → harmonized quality supervision → production performance. All of the paths must pass harmonized quality supervision as a gateway towards the production performance. Therefore, the company's production-oriented performance should apply activities that represent harmonized quality supervision.

Harmonized quality supervision contributes to build the theory of quality management. In the beginning, the implementation of management quality becomes the responsibility of each division of the company without neglecting the leadership commitment in directing each division (Bhatia and Awasthi, 2018). Quality improvement problems occur because of the interdependence between divisions of companies that require encouragement and involvement of all parts. Therefore the company can use harmonized quality supervision as a driver of quality improvement (Wu, 2015). Harmonized quality supervision fills the theoretical building of quality management on how to direct all divisions to maintain commitment for quality improvement.

The production department, which is committed to producing goods orders to meet the expected consumer preference, is not able to increase the number of qualified goods. This can be understood as printing company often work on bulk ordering system and must be completed in a short time (Bhatia and Awasthi, 2018). Most of the customers of printing industry have a tight schedule for specific products or services launch. They order printed material to support the promotion of products or services. Notwithstanding, production has awareness to the importance of quality printing products, they are not capable to achieve production plan for the complexity of printing goods orders (Yunis, Jung, and Chen, 2013).

B. Managerial Implication and Future Research

Printing company can do various steps of suppression and improvement to improve production performance. Companies need to be more open to the presence of new printing technology through online media, printed media, or exhibition. Companies may discuss with technology experts to explain how far these new technologies can help to improve the quality and productivity of production (Baker and Sinkula, 1999). Companies should equip the production division with knowledge of consumer behavior on an ongoing basis so that they are able to translate the wishes of consumers in the form of corresponding product attributes.

Responding to the rapid development of printing technology, companies seek to enhance production skills intensively through the involvement of employees in training or workshops. Companies should be aware to the development of the market from suppliers, competitors, and customers, is very dynamic. So, companies need to enrich their knowledge about the quality of production process (Mehra and Coleman, 2016). Companies can internalize the quality of production through the awards giving to employees who excel. Companies can also disseminate a culture of quality production through the evaluation of production quality achievement.

Companies need to regularly scheduled meetings between important divisions like marketing, finance, human resources, and of course, its own production division to discuss the development of production and provide troubleshooting to support production (Bhatia and Awasthi, 2018). Companies can create a cross-sector task force for the completion of certain orders if the project is very complex and has a critical time. Task force members, who are comprised from various fields, allow every member to communicate the necessary support to some managers of marketing, finance, and resources (Yeung, Cheng, and Lai, 2005).

Suggestions for further research can be grasped based on the weakness of the study. Subsequent research can maximize interview method for collecting data to ensure the comprehensive questionnaires. The total amount of data that can be collected at the beginning of this study is actually quite a lot, it is 305. After going through the stages of data filtering, 40 respondents should be eliminated because of incomplete questionnaires, inconsistent answers or answers that tend to be outliers. Amounts of eliminated data can be avoided if the method of interviews with respondents were done.

Various unexplored variable antecedents in this study can be used to develop a research model. Achievement of the goodness of fit from the model is not optimal because of many ineligible parameters. The next research can involve many other variables with regard theoretical foundation and logic of expertise. Other recommended variables such as production flexibility, information technology, and intra-organization communication.

Appendix

Items in questionnaire
(Options of question follow an interval scale, 1-10)

Harmonized quality supervision

- Company keeps the commitment of all divisions in production process quality achievement
- Company attempts to pursue information sharing on the development of production process quality to all divisions
- Company relates the development of production process quality with other divisions
- Company involves in all divisions for enhancing production process quality

Technological learning capability

- Company seeks to learn new technology
- Company is able to do new method
- Company could apply new tools

Market dynamic recognition
- Company knows product attributes from customer
- Company set the attribute product preference priority from customer
- Company responds to change of customer preferences

Quality responsibility
- Company always emphasizes the important of advantage product attributes
- Company applies the culture of excellent production process quality
- Company employs any ways to improve production process quality

Production performance (for recent 3 years)
- Declining defective products
- Suitability of order quantity in production division
- Fulfilling the order quality in production division

REFERENCES

Anderson, R.D, and R.E. Jerman. 1998. "Quality Management Influences on Logistics Performance." *Logistics and Transps Rev* 34(2): 137–48.

Baker, W.E., and J.M. Sinkula. 1999. "The Synergistic Effect of Market Orientation and Learning Orientation on Organizational Performance." *Academy of Marketing Science* 27(4): 411–27.

Bhatia, M.S., and A. Awasthi. 2018. "Assessing Relationship between Quality Management Systems and Business Performance and Its Mediators: SEM Approach." *International Journal of Quality and Reliability Management* 35(5): 1034–59.

Bolívar-Ramos, M.T, V.J. García-Morales, and E. García-Sánchez. 2012. "Technological Distinctive Competencies and Organizational Learning: Effects on Organizational Innovation to Improve Firm Performance." *Journal of Engineering and Technology Management - JET-M* 29(3): 331–37.

Fang, E.A.H., X.Y. Li, and J.J. Lu. 2016. "Effects of Organizational Learning on Process Technology and Operations Performance in Mass Customizers." *International Journal of Production Economics* 174: 68–75.

Ganesan, S., S.P. Brown, B.J. Mariadoss, and H. Ho. 2010. "Buffering and Amplifying Effects of Relationship Commitment In Business-To-Business Relationships." *Journal of Marketing* 47(2): 361–73.

Herdian, R., 2014. *Printing Technology Evolution in Paper Packaging: Seminar,* 5 September 2014. Jakarta.

Ilkay, M.S., and E. Aslan. 2012. "The Effect of the ISO 9001 Quality Management System on the Performance of SMEs." *International Journal of Quality and Reliability Management* 29(7): 753–78.

Jung, J., X.M. Su, M. Baeza, and S.K. Hong. 2008. "The Effect of Organizational Culture Stemming from National Culture towards Quality Management Deployment." *The TQM Journal* 20(6): 622–35.

Kafetzopoulos, D.P., E.L.Psomas , and K.D. Gotzamani , 2015. "The Impact of Quality Management Systems on the Performance of Manufacturing Firms." *International Journal of Quality and Reliability Management* 32(4): 381–99.

Kaynak, H., 2003. "The Relationship between Total Quality Management Practices and Their Effects on Firm Performance." *Journal of Operation Management* 21: 405–35.

Kaynak, H, and J.L. Hartley. 2005. "Exploring Quality Management Practices and High-Tech Firm Performance." *Journal of High Technology Management Research* 16(2): 255–72.

Kitapçi, H., and V. Çelik. 2014. "The Relationship between Ambidexterity, Organizational Learning Capacity and Firm Quality Performance: An Empirical Study." *Procedia - Social and Behavioral Sciences* 109: 827–36.

KPMG. 2016. *Investing in Indonesia*. Indonesia.

LaHay, C.W., and J.S. Noble, 2001. *"*A Framework for Business System and Quality Management Integration*." International Journal of Quality and Reliability Management* 18(6): 289–306.

Laszlo, G.P. 1999. "Implementing a Quality Management Program – Three Cs of Success: Commitment, Culture, Cost." *The TQM Magazine* 11(4): 231–37.

Lee, J.M., and R. Peccei. 2008. "Lean Production and Quality Commitment: A Comparative Study of Two Korean Auto Firms." *Personnel Review* 37(1): 5–25.

Lemmink, J., 1996. "The Power Of Perceived Service Quality In International Marketing Channels." *European Journal of Marketing* 30(12): 22–38.

Leonard, D., and R. McAdam. 2004. "Total Quality Management in Strategy and Operations: Dynamic Grounded Models." *Journal of Manufacturing Technology Management* 15(3): 254–66.

McGuinness, T., and R.E. Morgan. 2005. "The Effect of Market and Learning Orientation on Strategy Dynamics: The Contributing Effect of Organizational Change Capability." *European Journal of Marketing* 39(11/12): 1306–26.

Mehra, S., and J.T. Coleman. 2016. "Implementing Capabilities-Based Quality Management and Marketing Strategies to Improve Business Performance." *International Journal of Quality and Reliability Management* 33(8): 1124–37.

Mikalef, P., and A. Pateli. 2017. "Information Technology-Enabled Dynamic Capabilities and Their Indirect Effect on Competitive Performance: Findings from PLS-SEM and FsQCA." *Journal of Business Research* 70: 1–16.

Pavlou, 2004. "IT-Enabled Dynamic Capabilities in the New Product Development: Building a Competitive Advantage in the Turbulent Environment." *Doctoral dissertation*, University of Southern California.

Perez-arostegui, M.N., and V. Barrales-molina. 2015. "Exploring the Relationship between Information Technology Competence and Quality Management." *Business Research Quarterly* 18: 4–17.

Phan, A.C., A.B. Abdallah, and Y. Matsui. 2011. "Quality Management Practices and Competitive Performance: Empirical Evidence from Japanese Manufacturing Companies." *International Journal of Production Economics* 133(2): 518–29.

Prabhu, V., A. Appleby, D. Yarrow, and E. Mitchell. 2000. "The Impact of ISO 9000 and TQM on Best Practice/Performance." *The TQM Magazine* 12(2): 84–92.

Prajogo, D., B.F. Huo, and Z.J. Han. 2012. "The Effects of Different Aspects of ISO 9000 Implementation on Key Supply Chain Management Practices and Operational Performance." *Supply Chain Management: An International Journal* 17(3): 306–22.

Prajogo, D.I., and A.S. Sohal. 2006. "The Integration of TQM and Technology/RandD Management in Determining Quality and Innovation Performance." *Omega* 34(3): 296–312.

Samson, D., and M. Terziovski. 1999. "The Relationship between Total Quality Management Practices and Operational Performance." *Journal of Operations Management* 17: 393–409.

Sánchez-Rodríguez, C., and A.R. Martínez-Lorente. 2011. "Effect of IT and Quality Management on Performance." *Industrial Management + Data Systems* 111(6): 830–48.

Setiawan, A.I., and A. Hanfan. 2017. "Elaborating the Role of Network Synergy Capacity as a Supplier's Alternative Terminal for Achieving Marketing Performance." *International Journal of Business and Society* 18(2): 245–62.

Solis, L.E., S.S. Rao, T.S. Raghu-Nathan, C.-Y. Chen, S.-C. Pan. 1998. "Quality Management Practices and Quality Results: A Comparison of Manufacturing and Service Sectors in Taiwan." *Managing Service Quality* 8(1): 46–54.

Sun, H.Y., and W.B. Ni. 2012. "The Impact of Upstream Supply and Downstream Demand Integration on Quality Management and Quality Performance." *International Journal of Quality and Reliability Management* 29(8): 872–90.

Switzer, L.N., and J.-F. Bourdon. 2011. "Management Quality and Operating Performance: Evidence for Canadian IPOs." *International Journal of Business* 16(2): 133–49.

Tetsu, Y.H. 2013. *The Secret of Printing Business in Indonesia*. Billix Multimedia.

Trentin, A., E. Perin, and C. Forza. 2012. "Product Configurator Impact on Product Quality." *International Journal of Production Economics* 135(2): 850–59.

Wankhade, L.N., and B.M. Dabade. 2007. "Information Symmetry, Quality Perception, and Market Dynamics." *Journal of Modelling in Management* 2(3): 208–31.

Wu, S.J. 2015. "The Impact of Quality Culture on Quality Management Practices and Performance in Chinese Manufacturing Firms." *International Journal of Quality and Reliability Management* 32(8): 799–814.

Wu, S.J., D.L. Zhang, and R.G. Schroeder. 2011. "Customization of Quality Practices: The Impact of Quality Culture." *International Journal of Quality and Reliability Management* 28(3): 263–79.

Yeung, A.C.L, T.C.E. Cheng, and K.-H. Lai. 2005. "An Empirical Model for Managing Quality in the Electronics Industry." *Production and Operations Management* 14(2): 189–204.

Yunis, M., J. Jung, and S.M. Chen. 2013. "TQM, Strategy, and Performance: A Firm-Level Analysis." *International Journal of Quality and Reliability Management* 30(6): 690–714.

Zeng, J., C.A. Phan, and Y. Matsui. 2015. "The Impact of Hard and Soft Quality Management on Quality and Innovation Performance: An Empirical Study." *International Journal of Production Economics* 162: 216–26.