Design of E-commerce Competency Improvement Program for Batik SMEs in Surakarta

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Abstract. The rapid development of information and internet technology has encouraged trade using the internet (e-commerce). This development must be followed by SMEs using e-commerce to improve their sales. The determining factor in adopting e-commerce for SMEs is an individual factor consisting of innovation of business owners, IT capabilities of business owners and IT experience of business owners. Competence of SME owners determines the success of e-commerce adoption by SMEs. Therefore, the government has a responsibility to improve the e-commerce competency of SME owners. E-commerce competency identification is needed to obtain e-commerce competency standards. These competencies are identified using a functional approach of e-marketplace and social commerce business process. The identified e-commerce competencies must be selected before being used in e-commerce competency improvement. The selection is considering the correlation of the e-commerce competencies with the value of e-commerce sales. Therefore, this study used a correlation analysis to select e-commerce competencies. The results of this study indicate 17 e-commerce competencies used in e-commerce competency improvement program of Batik SMEs in Surakarta.

1. Introduction
The rapid development of information and internet technology has encouraged trade using the internet (e-commerce). E-commerce is a transaction in trade business process where internet, web, mobile applications and browsers on mobile devices are used to make purchases, sales, transfers, or exchanges of products, services or information [1][2]. According to Bank Indonesia, the e-commerce transaction value of Indonesia in 2015 was approximately USD 3.5 billion. Compared to 2014, this value increased by 34.6% from USD 2.6 billion [3]. However, Indonesia is expected to gain more value up to USD 16.5 billion by 2022 [4]. This is considered as a great opportunity for SMEs to expand their market. Therefore, the Indonesian Government targets 8 million SMEs in Indonesia to use e-commerce by 2019. To accomplish this goal the government along with 6 e-marketplaces in Indonesia, such as Tokopedia, Bukalapak, Lazada, Shopee, Blanja.com and Blibli.com have arranged a program called Ayo UKM Berjualan Online for SMEs [5].

The determining factor in e-commerce adoption by SMEs is the individual factor consisting of 3 sub-factors, namely innovation of business owners, IT capabilities of business owners and IT experience of business owners [6]. The level of innovation and IT ability of business owners are influenced by their competencies, as initiators and decision makers. Therefore, business owner competencies influence the success of e-commerce adoption in SMEs. Competency is the ability to carry out work or assignments based on skills and knowledge which is supported by work attitudes [7]. Competency improvement can be done by providing training to SME owners.
The government of Surakarta, especially *Dinas Tenaga Kerja dan Perindustrian* has the main task of carrying out government affairs in the fields of labor and industry based on the principles of regional autonomy and assistance tasks. There are 9 functions of the main tasks, one of them is to organize workers placements, training and transmigration [8]. Therefore, the government has to organize training programs for SMEs. In this case, the training program is an improvement program of the e-commerce competency. The target of the program is SMEs that have used e-commerce for their business.

In this study, we used a functional approach to business processes in e-marketplace and social commerce to identify e-commerce competency [9]. The identified e-commerce competencies need to be selected before given to SMEs. The selection can be made by considering the correlation of e-commerce competence with the value of e-commerce sales. It means the correlation of e-commerce competencies need to be evaluated. Correlation analysis is a method to determine the strength and direction of correlation between two variables [10]. Therefore, correlation analysis was used to determine e-commerce competencies which will be used for the e-commerce competency improvement program.

2. Method

In this study, the identification of competencies used a functional approach from e-marketplace and social commerce business processes. The identification results are validated to SMEs who have used e-commerce. The questionnaire used to collect the validation data which measure the important rate of e-commerce competency. The result of the questionnaire is calculated using the natural cut off point method. This method eliminates e-commerce competencies which have an average value below the natural cut off point. The natural cut off point equation is as follows [11]:

$$\text{Natural Cut Off Point} = \frac{\text{max} \{x_{i}\} + \text{min} \{x_{i}\}}{2}, \ i = 1, 2, 3, \ldots, n$$ (1)

Validated e-commerce competencies are organized into competency map according to the *Standar Kompetensi Kerja Nasional Indonesia* (SKKNI). Competency map is a comprehensive description of the competencies of each function in a business field that will be used as a reference in developing competency standards [12]. Based on the competency map, e-commerce competency assessment instruments are prepared to measure the e-commerce competency of SMEs. The instrument consists of independent variables and dependent variables. The instrument used to evaluate the e-commerce competency of Batik SMEs in Surakarta. The results of the assessment are scaled using a scoring system on the key performance indicator (KPI). The scoring system equation is as follows [13][14]:

| Condition                      | Score (%)                     |
|--------------------------------|-------------------------------|
| Higher is better               | (actual/target) x 100%        |
| Lower is better                | (2-(actual/target)) x 100%    |
| Must be zero                   | 0 if actual = 0 or 100 if actual ≠ 0 or 100 if actual = No (Yes/No Question) or 0 if actual = Yes (Yes/No Question) |
| Must be one                    | 0 if actual = 1 or 100 if actual ≠ 1 or 100 if actual = Yes (Yes/No Question) or 0 if actual = No (Yes/No Question) |

E-commerce competency score is used to measure the relationship of e-commerce competencies with the value of e-commerce sales. The measurement uses correlation analysis method by comparing each e-commerce competency with the value of e-commerce sales. In the correlation analysis, the data distribution has to be normal. So, normality test is needed to find out whether the research data is normally distributed or not. Population distribution is normal if the probability value is greater than 0.05 [15].
In this study, use Pearson correlation analysis method for data analysis. Pearson correlation analysis is a statistical technique which used to determine the correlation between two variables with normal distribution of data requirements. Pearson correlation analysis equation is as follows [16]:

\[ r_{xy} = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{n \sum x^2 - (\sum x)^2}n \sum y^2 - (\sum y)^2} \]  

\( r \): correlation coefficient  
\( n \): sample size  
\( x \): independent variable  
\( y \): dependent variable

Correlation coefficient range from -1 to 1, where the closer the correlation coefficient to 1, the correlation between the two variables is stronger. While the negative and positive values on the correlation coefficient indicate the direction of the relationship. The direction of the positive relationship shows unidirectional relationships, otherwise the negative relationship shows the relationship is in the opposite direction. The interpretation of the correlation coefficient is as follows [17].

| Correlation coefficient | Relationship level       |
|-------------------------|--------------------------|
| 0.00 < r < 0.10         | Negligible correlation   |
| 0.10 < r < 0.39         | Weak correlation         |
| 0.40 < r < 0.69         | Moderate correlation     |
| 0.70 < r < 0.89         | Strong correlation       |
| 0.90 < r < 1.00         | Very strong correlation  |

### 3. Result and Discussion
In this study, we identified e-commerce business process from e-marketplace and social commerce. E-marketplace are business model where the website is not only helps in promotion but also facilitates online sales transaction. E-marketplace used to identify e-commerce business process are Tokopedia, Bukalapak, Shopee, Blibli.com and Blanja.com. Meanwhile, social commerce is use of social media to promote their product and use of instant messaging to make transaction with consumers. Social commerce used to identify e-commerce business process are Instagram, Facebook, Line and WhatsApp. Based on the business process of e-marketplace and social commerce we conclude the business process of e-commerce is as in Table 3.

| Business Process                  | Description                                         |
|-----------------------------------|-----------------------------------------------------|
| Making email                      | Making username and password email for online shop   |
| E-commerce registration           | Making username and password online shop in e-commerce|
| Making online shop profile        | Digitalizing the physical data of the shop and arranging the online shop profile |
| Uploading product                 | Digitalizing the physical data of product and arranging the product catalog of the online shop |
| Promotion                         | Promotion with various promotional features on e-commerce |
| Sales Management                  | Communicate with consumers, check order status and record orders received |
| Revenue management                | Ensure the revenue has been received into the online shop account |
| Shipping product                  | Packing and shipping products to consumers          |
| Complaint management              | Discuss, provide solutions and record complaints from consumers |

The Table 3 summarizes the business process in e-marketplace and social commerce. Both of them have different business processes such as in revenue business process. In an e-marketplace, consumers
will pay the product into a third account (e-marketplace account). Seller will get notification of the payment and proceed to shipping the product. The payment will be sent through e-money of e-marketplace after the product is received. Otherwise on social commerce, the sellers receive payments directly from consumers by transferring to online shop account. The payment is received before shipping the product. This difference shows transaction security of e-marketplace is more guaranteed because payments are made through e-marketplace account. Therefore, e-marketplace is more suitable for SMEs who are new in e-commerce.

Based on e-commerce business processes in Table 3, we identify e-commerce competency with identifying core competency, competency criteria and explanations criteria. The identification has identified 29 e-commerce competencies as in Table 4. The identified e-commerce competency is measured the level of importance to validate each e-commerce competency. The measurement used questionnaires and distributed to 41 SMEs that have already used e-commerce. Based on the results of the measurements, there are four e-commerce competencies that are not important because the average of importance level is below the natural cut off point. These e-commerce competencies are able to make username of online shop email, able to make password of online shop email, able to make username for online shop in e-commerce and able to make password for online shop in e-commerce. Therefore, these e-commerce competencies are not used in the next stage because the SMEs already have it.

| No | Business Process                      | Competency                                           |
|----|--------------------------------------|------------------------------------------------------|
| K-1.1 | Making email                        | Able to make username of online shop email           |
| K-1.2 |                                    | Able to make password of online shop email           |
| K-2.1 | E-commerce registration              | Able to make username for online shop in e-commerce  |
| K-2.2 |                                    | Able to make password for online shop in e-commerce  |
| K-3.1 | Making online shop profile          | Able to make online shop rules                       |
| K-3.2 |                                    | Able to design shop/brand logo                      |
| K-3.3 |                                    | Able to make shop/brand descriptions                |
| K-3.4 |                                    | Able to display profile of the company at the online shop |
| K-4.1 | Uploading product                   | Able to take product photos                         |
| K-4.2 |                                    | Able to make product descriptions                    |
| K-4.3 |                                    | Able to upload products at online shop               |
| K-5.1 | Promotion                           | Able to promote products on e-marketplace            |
| K-5.2 |                                    | Able to promote products on social media             |
| K-6.1 | Sales Management                    | Able to make list of frequently asked questions and answers |
| K-6.2 |                                    | Able to explain product specification                |
| K-6.3 |                                    | Able to check the transaction status of product sales|
| K-6.4 |                                    | Able to record data of online shop sales             |
| K-9.1 | Revenue management                  | Able to ensure the invoice has been paid to the online shop e-money |
| K-9.2 |                                    | Able to withdraw money from online shop e-money      |
| K-9.3 |                                    | Able to record data of online shop revenue           |
| K-9.4 |                                    | Able to ensure the invoice has been paid to the online shop account |
| K-7.1 | Shipping product                    | Able to check product before shipping                |
| K-7.2 |                                    | Able to pack product before shipping                 |
| K-7.3 |                                    | Able to record data of shipped product               |
| K-7.4 |                                    | Able to confirm shipped product to consumers         |
| K-7.5 |                                    | Able to track shipped product                        |
| K-8.1 | Complaint management                | Able to explain complaint                           |
| K-8.2 |                                    | Able to provide solutions for the complaint          |
| K-8.3 |                                    | Able to record the complaints and solutions          |
Validated e-commerce competencies are organized into competency maps which consist of the main purpose of the job function, key function of the main purpose, major function of the key function, and basic functions of the major function. This e-commerce competency is used to prepare e-commerce competency measurement instruments. The instrument consists of independent variables and dependent variable. The independent variables are validated e-commerce competency. While the dependent variable is the value of e-commerce sales. The instrument is distributed to nine Batik SMEs which have used e-commerce. The results are scaled to get scores from each e-commerce competency. The measurement results show that there are a significant difference scores between small and medium enterprise. Therefore, the instrument is validated locally for Batik SMEs in Surakarta.

Based on the results of the normality test shows that two e-commerce competencies are not normally distributed. These e-commerce competencies are competency able to design shop/brand logo and competency able to check product before shipping. Both competencies have same scores in each SMEs because SMEs already have capability in these competencies. Therefore, the competencies do not meet the correlation analysis requirement and is not include in later stage.

The correlation analysis results indicate seventeen e-commerce competencies have significant effect on the value of e-commerce sales. The significant effect shows the competencies improvement will improve the value of e-commerce sales. Therefore, these e-commerce competencies are used to planned the improvement program for UKM Batik e-commerce. Table 5 shows the e-commerce competency planned in an improvement program.

| Business Process                  | Competency                                                                 |
|----------------------------------|---------------------------------------------------------------------------|
| Making online shop profile       | Able to make online shop rules                                           |
|                                  | Able to display profile of the company at the online shop                 |
| Uploading product                | Able to take product photos                                              |
|                                  | Able to make product descriptions                                        |
|                                  | Able to upload products at online shop                                   |
| Promotion                        | Able to promote products on e-marketplace                                 |
|                                  | Able to promote products on social media                                  |
| Sales Management                 | Able to make list of frequently asked questions and answers              |
|                                  | Able to check the transaction status of product sales                     |
|                                  | Able to record data of online shop sales                                 |
| Revenue management               | Able to record data of online shop revenue                                |
|                                  | Able to ensure the invoice has been paid to the online shop account       |
| Shipping product                 | Able to record data of shipped product                                   |
|                                  | Able to track shipped product                                            |
| Complaint management             | Able to explain complaint                                                |
|                                  | Able to provide solutions for the complaint                              |
|                                  | Able to record the complaints and solutions                              |

The e-commerce competencies in Table 5 are the competencies that should be improved by stakeholders, i.e. government or SMEs association, for the SMEs in Surakarta. The competencies are grouped by business processes of e-commerce in e-marketplace or social commerce. Based on Table 5, there are two e-commerce competencies in the making online shop business process, namely able to make online shop rules and able to display the profile of the company in the online shop. Furthermore, in the uploading product business process there are three e-commerce competencies, namely able to take product photos, able to make product descriptions and able to upload products at the online shop. Based on the result of this research, the stakeholder that will hold a training with curriculum according to each business process. SMEs can join half or whole training program according to their needs. For example, SMEs can join the complaint management training program if they can not handle a complaint from
their consumer. So, the training efficiency and effectiveness can be obtained because the training participants have been distributed according to their individual needs.

4. Conclusion
In this study, we have identified 29 e-commerce competency with four competencies are not used in the next stage because the SMEs have implemented it. According to the correlation analysis, seventeen e-commerce competencies have a significant influence on the value of e-commerce sales. Therefore, this competency is used to plan an e-commerce competency improvement program for Batik SMEs in Surakarta. The plan is only in the form of competency with learning sequence according to e-commerce competency improvement program for Batik SMEs, so the e-commerce competency improvement can be implemented.

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