The Influence of Online Transaction on Increasing The Profit of SMEs Using Structural Equation Modeling

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Abstract - The aim of this paper is to find out how effective e-commerce to promote and selling the product of MSME. The method chosen to conduct this research is by using DeLone and McLean's Information Success Model combined with Structural Equation Method (SEM) to find pertaining variable. Data are derived from data transaction with machine learning by conducting converting rule. The result of this research is (1) the correlation of net benefit with other dimension in DeLone and McLean model (2) the dominant variables that increasing the profit of SME (Small and Medium Enterprise).

1. Introduction

In a developing country like Indonesia, there is a kind of entrepreneurship done by local society called Micro Small and Medium Enterprise (MSME). In Malaysia is called only SME. MSME in Indonesia usually located in business cluster produced the same product, they are very prospective group in improving profit for the society and reduce un-employer problem. They sometimes have problem in promotion, raw material, quality process, delivery and packaging and also, they should compete with superior enterprise. Government has put forward some regulation to protect from import product and improving the product quality with some training. Some of them have used e-commerce to promote the product and sometimes they combine with social media to inform the product to their member.

Although web and social media are easy to make them, however MSME need extra effort to update the content and record the attendee who visit only and buy product. With consideration that every MSME has limited budget. They have limited money to invest in Online Transaction so they eagerly to know how to measure performance of online Transaction which support to find a new customer and sell goods or services.

Statistical data is shown that the number of MSME unit is 99.9% from the total unit of enterprise in Indonesia (Source: Indonesian Ministry of Cooperative and MSME, 2012). In other hands, the number of employers involved are achieved 97.24% or about 101,722,458 people from the total of the employer in Indonesia. If in one year ago the MSME number is about 52.8 million units, so this year they are having increasing in number to become 55.2 million units. Every MSME can absorb 3 until 5 employers. So, with the addition of 3 million units, the number of absorbed employers will increase until 15 million people. Unemployment is expected to be decreased from 6.8% to 5% with the increasing of MSME. This phenomenon reflected that there is a significant role from MSME in contributing the growing monetary rate of the real sector. By fact that the economy growing rate of Indonesia achieves 6.2%, can be assumed that the MSME has a positive impact on the Indonesian environment. So, it is time for government and MSME to grow in selling rate and improve the quality process so they can have a competitive advantage to deal with competitors [1]. Cheap promotion by e-commerce and social media is some of the practical solution to promote the product anytime and anywhere. But the problem is how we make sure that the web or social media has achieve the target market, and how can we measure the success of e-commerce impact to MSME, the other question is, was it valuable to update the content time by time with correlation to the selling number.
According to Saeful Bahri,[2] chief of the Regional Parliament of Bandung Regency for B Commission that about 1,400 MSME or 20% from total about 7000 MSME Actor in Bandung Regency can do export to abroad besides there are a lot of complex problem should be dealt first. AFTA has given positive impact and also the negative impact on the other hand. “range of marketing of MSME becomes infinite with exporting abroad, but there will be threat to MSME when they did not ready to prepare for good technology, marketing process and financial support ” Monday (15/10/2012). According to Chief of Developing Department of MSME in Bandung Regency, Pujo Semedi, Government of Bandung Regency believes that MSME will increase the local economic and MSME will be essential for the national economy. Bureau of Cooperative, Industry and Trade (Diskoperindag) of Bandung Regency has targeted the absorbing of the employer will be made 10,000 people (24/02/2013).

The objectives of this research are to find out how effective e-commerce to promote and selling the product of MSME. The method chosen to conduct this research is by using DeLone and McLean’s Information Success Model combine with Structural Equation Method (SEM) to find pertaining variables. Further, the result of this research will be compared with the counter research done by Universiti Utara Malaysia as a partner of this joint research.

2. Methods

Effective measurement of E-Commerce success is a key issue for both MSME and researchers. The measurement of success is critical in order to understand the value of e-commerce management actions and e-commerce investments [3][4] The DeLone and McLean model performs integrated and comprehensive model of success. They categorized is success into six dimensions:

1. System Quality
2. Information Quality
3. Use
4. User Satisfaction
5. Individual Impact,
6. Organizational Impact.

These six dimensions will be empiric factor for this research. Figure 1 present these six interrelated dimensions of success: System Quality and Information Quality singularly and jointly affect both Use and User Satisfaction. In addition, the amount of use can have a positive or negative effect on the degree of User Satisfaction and vice versa. Use and User Satisfaction are direct antecedents of individual impact, and this impact should eventually have some Organizational Impact. Figure 2 showed the updated D&M model.

![Figure 1. Information System Success Model](image-url)
In DeLone and McLean IS success model, these six dimensions are examined at three different levels: technical level, semantic level, and effectiveness or influence level. First dimension of the model, Systems Quality, studies the success at a technical level. It focuses on the desired characteristics of the information system itself which produce the information. Second dimension, Information Quality, focuses on the information product instead, and characteristics at the semantic level, i.e. “the success of the information in conveying the intended meaning”. Some examples of successful measures of Systems and Information Quality are listed in Table 1.

**Table 1.** Examples of Success Measures – Systems Quality and Information Quality

| System Quality                                      | Information Quality |
|-----------------------------------------------------|---------------------|
| Ease to use                                         | Importance          |
| Ease of learning                                    | Relevance           |
| Convenience of access                               | Usefulness          |
| Realization of user requirements                     | Timeliness          |
| Usefulness of system features and functions          | Readability          |
| Data and system accuracy                            | Content             |

At the influence level, Use and User Satisfaction are measured in order to analyze the interaction of the information product with its recipients. Some examples of successful measures of Use and User Satisfaction are listed in Table 2.

**Table 2.** Examples of Success Measures – Use and User Satisfaction

| Information Use                                      | User Satisfaction                                      |
|------------------------------------------------------|--------------------------------------------------------|
| Amount/duration of use                               | Satisfaction with specifics                            |
| Actual vs reported use                               | Overall satisfaction                                   |
| Nature of use: use for intended purpose, appropriate use, type of information used | Information satisfaction: Difference between information need and received |
| Motivation to use                                    | Enjoyment                                              |
In addition, the influences which the information product has on management decision (Individual Impact) and on organizational performance (Organizational Impact) are measured at the influence level. Some examples of successful measures are presented in Table 3. This research uses analytical comparative method. Each of the parties, UNIKOM and UUM will do the research separately in each country with the same method and the same research variables. The results in the end will be compared to find the behavior of SME in each country. The similarity and the discrepancy will be the novelty of this joint research.

Table 3. Examples of Success Measures – Individual Impact and Organizational Impact

| Individual Impact                  | Organizational Impact                  |
|------------------------------------|----------------------------------------|
| Learning                           | Operating cost reduction               |
| Decision effectiveness:            | Staff reductions                       |
| Decision quality, Improved decision analysis, Correctness, time to make decision |                          |
| Improved individual productivity   | Overall productivity gains             |
| Task performance                   | Increased revenues, sales, market share, profits |
| Problem identification             | Increased work volume                  |
| Willingness to pay for information | Service effectiveness                  |

2.1. Sampling and Data

Data is collecting from Indonesia by UNIKOM (Universitas Komputer Indonesia) and from Malaysia by UUM (Universiti Utara Malaysia). UNIKOM choose Shout.ID as SME target, the company which already established in selling online and offline. The research variables are done with the agreement between two parties, UNIKOM and UUM. Sampling method can be survey method or non-survey method, but the variables are the same. With survey method, some questionnaire are designed with the Likert scale (5=very agree, 4= agree, 3= fair, 2= not agree, 1= very not agree). Technically, we can spread the questionnaire when customers come into the shop or we can put the questionnaire on the web as an online questionnaire. Both are eligible.

In non-survey method, data are extracted from database and then matched to research variables of research using converting rule. Converting rule is a logical rule, developed to obtain the research variables. The research variables are adopted from D&M Model. Then some statically analysis will be the variables used in this research can be found in Table. 4. The updated D&M model used in this research (Figure 2). For simplicity, the variable use and user satisfaction is combined into one variable and we named it as Usage, as shown in Table 4.
Table 4. Research Variables for Online Marketing System

| Latent Variables     | Type                          | Measurable Variables                                                                 | Type                          |
|----------------------|-------------------------------|--------------------------------------------------------------------------------------|-------------------------------|
| System Quality       | Exogenous Variable (\(\mathcal{X}\)) | 1. System is user friendly  
2. System is easy to use for sharing information  
3. Customer can get accurate information from the system | Independent Manifest Variables (\(x\)) |
| Information Quality  | Exogenous Variable (\(\mathcal{X}\)) | 4. System provide precise information  
5. System provide sufficient information  
6. System provide up to date information | Independent Manifest Variables (\(x\)) |
| Service Quality      | Exogenous Variable (\(\mathcal{X}\)) | 7. User feel safe in sharing personal information using the system  
8. System is available all the time | Independent Manifest Variables (\(x\)) |
| Usage                | Endogenous Variable (\(\mathcal{E}\)) | 1. User uses system frequently  
2. User very dependsent to system  
3. System has simple navigation | Dependent Manifest Variables (\(y\)) |
| Net Benefit          | Endogenous Variable (\(\mathcal{E}\)) | 4. System reduces customer time to find product  
5. System helps user make right choice | Dependent Manifest Variables (\(y\)) |

And some examples of the questionnaire design can be shown in Table 5.

Table 5. Example of question

| System Quality       | Information Quality  | Service Quality                        | Usage                                   | Net Benefit                                      |
|----------------------|----------------------|---------------------------------------|----------------------------------------|-------------------------------------------------|
| Is system user friendly? | Does system provide precise information to customer? | Do user feels safe?  
Does user use the system frequently? | Does system make customer task easier? |
| Is System easy to use for sharing information? | Does the system provide sufficient information? | Does user personal information treat confidential?  
Does user be independence to the system? | Does system save user time? |
| Does system give user accurate information? | Does the system have fast response time? | Does system have fast available all the time? | Does the system reduce search cost? |
| Does system increase user satisfaction and promote repeat visiting | | | | Does the system have simple navigation |
| | | | | Does the system help user to make right choice |

2.2. Structural Equation Model and Hypothesis

Domain of information success model then represented by Structural Equation Modeling (SEM). SEM itself is contained by two model i.e. measuring model and the structural model. The measuring model identifies the latent variables and the observable variables. The structural model defines the causal model of latent variables.
Analysis with SEM has two stages there are Confirmatory Factor Analysis and Structural model [3]. Those variables from Table 4 are used for Confirmatory Factor Analysis help by statistical tools. UNIKOM uses JASP. Open source of statistical tools run on MacOS. Structural Equation Modeling of this research according to Table 4 can be drawn as shown in Figure 3 and the Structural Equation Model is:

\[
\begin{bmatrix}
\eta_1 \\
\eta_2
\end{bmatrix} =
\begin{bmatrix}
0 & 0 \\
\beta_{12} & 0
\end{bmatrix}
\begin{bmatrix}
\eta_1 \\
\eta_2
\end{bmatrix}
+ 
\begin{bmatrix}
\gamma_{11} & \gamma_{12} & 0 \\
0 & \gamma_{22} & \gamma_{23}
\end{bmatrix}
\begin{bmatrix}
\xi_1 \\
\xi_2 \\
\xi_3
\end{bmatrix}
+ 
\begin{bmatrix}
\varphi_1 \\
\varphi_2
\end{bmatrix}
\]

so, the structural equation is

\[\eta = \beta \eta + \Gamma \xi + \psi\]  \hfill (1)

and the measurement equation are

\[X = \Lambda_1 \xi + \epsilon \]  \hfill (2)
\[Y = \Lambda_2 \eta + \epsilon \]  \hfill (3)

According to Gorla et.al [6] system quality and content of information are the most important factors for someone to decide using online system. Organization create quality of the system and arrange the content so the user can use easily and like to use it again when they need it. So, the hypotheses are:

H1: System Quality can influence user to use the online system
H2: Information quality can drive user to like and use the online system

The availability of the system, the consistency of rule in e-commerce system will offer visitor to use repetitively, because they like to use familiar and reasonable of online service [7]. Visitor will not usage online system for purchasing if they do not have the benefit directly (see Figure 3). So, other hypotheses of this research are:

H3: Service Quality can make user to use repetitively the online system
H4: The usage of the online system will give benefit for the user

![Conceptual model of SEM for this research, developed from updated D&M Model](image_url)

**Figure 3.** Conceptual model of SEM for this research, developed from updated D&M Model
3. Results and Discussion

3.1. Profile of SME Target

Shout.id is founded by a couple young entrepreneurs in 2014, located in Bandung, Indonesia. The product is a fully customer-centered custom hat and t-shirt. The production process is built as a semi-automated production tool with online as a marketing channel. UNIKOM’s alumni become IT Manager in this company and builds the IT system. In two years, Shout.ID has 27,440 customers with customer profiles: 12% student, 24% university student, 29% employee. About 53% its customers age range is in before 29 years old, and 75% are males [8].

3.2. Converting Rules

As mention before to find the data, we use converting rule to extract from the database. The converting rule is shown in Table 6.

### Table 6. Converting table to derive research variables from database

|                     | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---------------------|-------------------|----------|---------|-------|---------------|
| **System Quality**  |                   |          |         |       |               |
| The online marketing system is user friendly | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visited 6 to 10 times | Visited more than 10 times |
| The online marketing system is easy to use for sharing information | | | | | |
| By the online marketing system, customer can get the accurate information | | | | | |
| **Information Quality** |                   |          |         |       |               |
| The online marketing system provides precise information that the customer need | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visited 6 to 10 times | Visited more than 10 times |
| The online marketing system provides sufficient information | | | | | |
| The online marketing system provides up-to-date information | | | | | |
| The online marketing system increases user satisfaction and the likelihood of repeat visits | | | | | |
| **Service Quality** |                   |          |         |       |               |
| The customer feels safe in sharing personal information while using the online marketing system | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visited 6 to 10 times | Visited more than 10 times |
| The online marketing system, the customers personal | | | | | |
| | | | | | |
| **Usage** | Strongly Disagree | Disagree | Netral | Agree | Strongly Agree |
|-----------|------------------|----------|--------|-------|----------------|
| Information is treated confidentially | No Offline Marketing System | 100% |
| The online marketing system is available all the time | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| Marketing system online system has fast response time elapsed | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| Custom frequently use he online marketing system | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| Customers dependention on the online marketing system | No Offline Marketing System | 100% |
| The online marketing system is available all the time | No Offline Marketing System | 100% |
| The online marketing system has simple navigation pattern | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| **Received Net Benefits** | No Offline Marketing System | 100% |
| The online marketing system makes cusome tasks, related to this agency, easier. | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| The online marketing system saves customers time | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| The online marketing system reducted search costs | No Offline Marketing System | Visited 1 time | Visited 1 to 5 times | Visits 6 to 10 times | Visited more than 10 times |
| The customer made the right choice the they started using The online Marketing System. | No Offline Marketing System | 100% |

3.3 **Structural Model obtained from the research**

The result of SEM Analysis can be seen in Figure 4. The validity of the research model is assessed by the structural paths and $R^2$s.
Variables with value greater than 0.5 can be assumed as dominant variable for this model. So, the dominant variables are X1, X3, X4, X5, X7, X8, Y1, Y3 Y4. From the correlation value the usage of online system dominantly caused by the quality of system with value 0.700. Hypothesis H3 is rejected because the value is negative so Service Quality in this research does not influence the usage for someone to repetitively use the online system [9][10].

4. Conclusion

We can conclude that the online transaction is influenced dominantly by some dominant variables which are: System User Friendly, System proceed up to date information, System increasing likelihood satisfaction to user, System has simple navigation. Net Benefit is strongly influenced by usage. Service Quality in this research does not influence the usage for someone to repetitively use the online system. However, the system quality (like accurate and ease to use) and quality of information (like update, precision and sufficient content of Information) is more affected to user to use online transaction system.

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References

[1] Campbell, D., Craig, T., Organisation and the Business Environment 2nd Edition., Heinemann: Elsevier Butterworth, 2012. Bahri
[2] S. Bachri, Muchtar, H., & Dermawan, E. (2014). Prototipe Sistem Kendali PID dan Monitoring
Temperatur Berbasis Labview. Prosidng Semnastek, 1(1).

[3] DeLone, W. H., McLean, E.R., "Information systems success: The quest for the dependent variable," Information Systems Research, vol. 3, no. 1, pp. 60-95, 1992.

[4] DeLone, W. H., McLean, E. R., "Measuring eCommerce Success: Applying the DeLone & McLean Information System Success Model.," International Journal of Electronic Commerce, vol. 9, no. 1, pp. 31-47, 2004.

[5] Konecny, D., An Empirical Test of Model Measuring Corporate Reputation from the Perspective of the Local Community., Aalborg University: MSc International Marketing, 2014.

[6] Gorla, N., Somer, T., Wong, B., "Organizational impact of system quality, information quality, and service quality," Journal of Strategic Information Systems, 2010.

[7] Samson, Y.D., Jongsu, L., "Technology adoption: A conjoint analysis of consumers' preference on future online banking services," Information Systems, 2015.

[8] Kementrian Koperasi dan UMKM, Undang-undang Nomor 20 Tahun 2008 tentang Usaha Mikro, Kecil dan Menengah (UMK) di Indonesia, Jakarta, 2008.

[9] Soegoto, E. S., Azhari, R. H. G., & Istiqomah, A. O. (2018, August). Development of desktop-based information system on waste management bank. Vol. 407, No. 1, p. 012058

[10] Soegoto, E. S., & Rafi, M. S. F. (2018, August). Internet role in improving business transaction. Vol. 407, No. 1, p. 012059