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

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 combine with Structural Equation Method (SEM) to find pertaining variable. Data are derived from data transactions with machine learning by conducting converting rule. The result of this research is (1) the correlation of net benefit with another dimension in DeLone and McLean model (2) the dominant variables that increasing the profit of SME

Keywords DeLone and McLean, Information System, MSME

I**ntroduction**

In a developing countries ' 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 with promotion, raw material, quality process, delivery and packaging and also they should compete with superior enterprise. The 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 needs extra effort to update the content and record the attendee who visit only and buy the product. In 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.

*1.1. MSME in Indonesia*

Statistical data is shown that the number of MSME unit is 99.9% of the total unit of enterprise in Indonesia (Source: Indonesian Ministry of Cooperation 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 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

employer 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.

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 achieved 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.

*1.2. MSME in Bandung Regency*

According to Saeful Bahri, chief of the Regional Parliament of Bandung Regency of 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 problems should be dealt with 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 a 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).

**Research Problem**

The problem of this research are

1. How to find the factor of success of MSME’s E-commerce
2. How to make strategic model in promotion to achieve success guarantee and has competitive advantage
3. Can we use DeLone and McLean Information Factor Success to be applied to MSME e-commerce in Indonesia

**Research Objective**

The objective of this research is to find out how effective e-commerce to promote and selling the product of MSME. The method choosen 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.

**Literature review**

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 (DeLone & McLean, 1992) and (DeLone & McLean, measuring eCommerce Success: Applying the DeLone & McLean Information System Success Model, 2004). 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 dimension 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

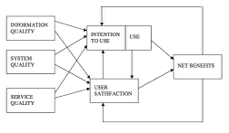


Figure 2 Updated D&M IS Success Model (DeLOne & McLean, 2003,24

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.

**Methodology**

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:  Decision quality, Improved decision analysis, Correctness, time to make decision | Staff reductions |
| 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 |

*Sampling and Data*

Data in Indonesia will be available from the SME target. 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 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 showed in Table 4

Table 4 Research Variables for Online Marketing System

|  |  |  |  |
| --- | --- | --- | --- |
| **Latent Variables** | **Type** | **Measureable Variables** | **Type** |
| System Quality | Exogenous Variable () | 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 () | 1. System provide precise information 2. System provide sufficient information 3. System provide up to date information 4. System increase user satisfaction and the likelihood or repeating user | Independent Manifest Variables (x) |
| Service Quality | Exogenous Variable () | 1. User feel safe in sharing personal information using the system 2. Personal information is treated confidentially 3. System is available all the time 4. System has fast response time or elapsed time | Independent Manifest Variables (x) |
| Usage | Endogenous Variable () | 1. User uses system frequently 2. User very dependents to system 3. System has simple navigation | Dependent Manifest Variables (y) |
| Net Benefit | Endogenous Variable () | 1. System makes customer tasks more easier 2. System reduces customer time to find product 3. System reduces search cost 4. 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 increase user satisfaction and promote repeat visiting | Does system have fast response time? | Does the system available all the time? | Does the system reduce search cost? |
|  |  |  | Does the system has simple navigation | Does the system help user to make right choice |

**Results**

*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,

 (1)

and the measurement equation are

 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.

*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.

*Structural Equation Model*

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 (Konecny, 2014). 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:



so the structural equation is

(2)



(3)

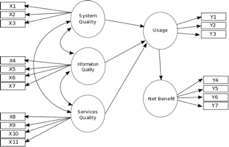


Figure 3Conceptual model of SEM for this research, developed from updated D&M Model

Table 6Converting table to derive research variables from database

*Statistical Analysis*

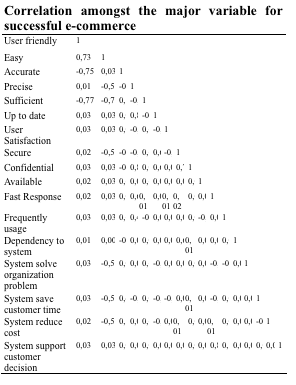
Firstly we want to use Goodness of Fit Indices for Structural Model of this research

|  |  |
| --- | --- |
| Parameter | Value |
| Chi-square with 15 degree of freedom | 212,23 |
| Root Mean Square Residual (RMR) | 0,06 |
| Goodness of Fit Index (GFI) | 0,87 |
| Normed Fit Index (NFI) | 0,88 |
| Comparative Fit Index (CFI) | 0,88 |
| Incremental Fit Index (CFI) | 0,88 |
|  |  |

The Goodness of Fit Index and other fit index is more than 0.5 so the SEM can be accepted

**Goodness of Fit Indices for Measurement Structural Model of this research**

|  |  |
| --- | --- |
| Parameter | Value |
| Chi-square with 15 degree of freedom | 257,24 |
| Root Mean Square Residual (RMR) | 0,06 |
| Goodness of Fit Index (GFI) | 0,98 |
| Normed Fit Index (NFI) | 0,97 |
| Comparative Fit Index (CFI) | 0,99 |
| Incremental Fit Index (CFI) | 0,99 |



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Structural Correlation among latent variables presented in the measurement model for successful e-commerce** | | | | | |
| System Quality | 1 |  |  |  |  |
| Information Quality | 0.29\* | 1 |  |  |  |
| Service Quality | -0.10\* | 0.41\* | 1 |  |  |
| Usage | 0,04 | -0,42 | -0.94\* | 1 |  |
| Net Benefit | -0,09 | 0.17\* | 0.86\* | -0.73\* | 1 |
| \* indicate 0.01 probability level of significance | |  |  |  |  |

Contributions of constructs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Total Effect of the Significant Variables on Usage** | | | | |
| Variables | Direct | Indirect | Total | Rank Order |
| System Quality | ------ | 0.15\* | 0,15 | 3 |
| Information Quality | ------ | -0.14\* | -0.14\* | 4 |
| Service Quality | ------ | -0,16 | -0.16\* | 2 |
| Usage | 0,29 | ------ | 0,29 | 1 |
| Net Benefit | -0,14 | ------ | -0,14 | 4 |

\* indicate 0.05 probability level of significance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Total Effect of the Significant Variables on Net benefit** | | | | |
| Variables | Direct | Indirect | Total | Rank Order |
| System Quality | ------ | -0,07 | -0,07 | 5 |
| Information Quality | ------ | 0,40 | 0,40 | 1 |
| Service Quality | ------ | 0,03 | 0,03 | 2 |
| Usage | 0.26\* | ------ | 0.26\* | 4 |
| Net Benefit | -0.25\* | ------ | -0.25\* | 3 |
| \* indicate 0.05 probability level of significance | | | |  |

Finding Coefficient

From estimation we can find the coefficient of each variables

|  |  |  |  |
| --- | --- | --- | --- |
| **Dependence manifest variables** | **Estimation value** | **Dependence manifest variables** | **Estimation value** |
| X1 | 0,86 | Y1 | 0,37 |
| X2 | 0,36 | Y2 | 0,02 |
| X3 | 0,16 | Y3 | 0,64 |
| X4 | 0,04 | Y4 | 0,33 |
| X5 | 0,38 | Y5 | 0,23 |
| X6 | 0,72 | Y6 | .0.07 |
| X7 | 0,65 | Y7 | 0,06 |
| X8 | 0,03 |  |  |
| X9 | 0,28 |  |  |
| X10 | 0,03 |  |  |
| X11 | 0,5 |  |  |

Variables with value greater than 0.5 can be assumed as dominant variable to his models. So the dominant variables are X1, X6, X7, Y3 which are:

System User Friendly, System proceed up to date information, System increasing likelihood satisfaction to user, System has simple navigation.

**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, usage itself is strongly influenced by service quality of online transaction.

**References**

Campbell, D., & Craig, T. (2012). *Organisation and the Business Environment 2nd Edition.* Heinemann: Elsevier Butterworth.

DeLone, W. H., & McLean, E. R. (1992). Information systems. *Information Systems Research* *, 3* (1), 60-95.

DeLone, W. H., & McLean, E. R. (2004). Measuring eCommerce Success: Applying the DeLone & McLean Information System Success Model. *International Journal of Electronic Commerce* *, 9* (1), 31-47.

Konecny, D. (2014). *Corporate Reputation of T-System Slovakia: An Empirical Test of Model Measuring Corporate Reputation from the Perspective of the Local Community.* Aalborg University: MSc International Marketing.

(2012). *Undang-undang Nomor 20 Tahun 2008 tentang Usaha Mikro, Kecil dan Menengah (UMK).* Kementrian Koperasi dan UMKM Indonesia.

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