Technology context and social media adoption among small and medium enterprises

Desi Ilona¹, Zerni Melmusi¹, Hanna Pratiwi¹ and Zaitul²*

¹Universitas Putra Indonesia YPTK, Padang, Indonesia
²Universitas Bung Hatta, Indonesia
zaitul@bunghatta.ac.id*

Abstract. This research paper aims to investigate the relationship between technology context and social media adoption among small and medium enterprise. Technology-organization-environment (TOE) is used to understand the relationship. Twenty-eight small and medium enterprises operating in west Sumatra province (Indonesia) is as research samples. SEM-PLS is applied to analyse the data. In this case, smart-pls is employed. It has two assessments: measurement model and structural model assessment. The result shows that there is a positive and significant relationship between technology context and social media adoption. This paper has practical and theoretical implication and they are discussed in detail. Recommendation for future work is also informed in this paper.

1. Background of the study
Small-medium enterprises (SMEs) have been contributing significantly to the country’s economic development [1]. Reference [2] argue that SMEs became the centre of rotation of the economy in local government in Indonesia. There are five benefits of SMEs for Indonesia economy that are owned by local people, mainly agriculture based, labour intensive, financial operation from personal saving, and mainly consumer goods [3]. Reference [1] add that there is almost 75% of employment in Indonesia works in SMEs, and contributing enormously to country’s Gross Domestic Product (GDP). To gain the survival and keep growing, SMEs have to fit with its environment. Due to changing in external business environment, especially technology changes, SMEs must reformulate its competitiveness position and come out with strategy. One of functional strategy is marketing strategy. Social media adoption is one of marketing strategy to keep survival and growing for small and medium enterprise.

Social media refers to using real time feedback, exchanging user-generated content and building communities of consumers to support business process [4]. Reference [5] argue that social media adoption by business organization can enhance the business operation, customer support, research and development, and sales and marketing. There are several previous studies investigating the role of social media to boost the SMEs’s performance [6]–[13]. Reference [12] develop a framework of social media adoption readiness among SMEs. Reference [7] interview SMEs owners/managers in UAE regarding to adoption of social media. They conclude that SMEs use social media, such as Facebook, Twitter, and Instagram. It will increases their performance. Reference [6] carried out a survey to explore factors
affecting the social media adoption among UAE’s SMEs and its impact on SMEs performance. Reference [9] investigated the factors influencing the Facebook usage among SMEs in Malaysia. They find that by using Facebook for SMEs’s business will impact on business performance. Reference [8] studies the effect of internet-based social media on SMEs’s competitive advantage in Gulf Cooperation Council (GCC) countries. Reference [13] perform a similar survey to establish the effect of social media on SMEs’s growth in Nairobi. Reference [10] study the use and measurement of social media for Scottish SMEs. Reference [11] conduct a series of interview regarding to the use of social media and found that social media usage for building customer relationship, advertising and promotion, information search, and branding.

There is no prior study to investigate social media adoption using an Indonesia’s SMEs. Even though, there is studies using SMEs in Indonesia [1]–[3], but they focus on other aspect of SME. For example, reference [1] assess the Indonesia’s SMEs competitiveness. In addition, reference [2] identify the critical success factor for downstream palm oil based SMEs. Finally, reference [3] describes three factor in developing SMEs cluster in Indonesia: network, government role and network for cluster SMEs. Besides, there is one study regarding to social media adoption among SMEs [14], but the study is technical study in nature and qualitative approach. Therefore, there is a gap in the literature in term of why Indonesia’s SME adopting social media. Thus, this study aims to investigate the effect of technology context on social media adoption among SMEs in west Sumatra, Indonesia. Technology context is suggested by technology-organization-environment (TOE) theory [15]. The theory suggests that there is technology-environment and organization outcome relationship. In fact, reference [16] The hypotheses of this study that is there is positive significant relationship between technology context and social media adoption. Yet, [16]’s finding is not supported. Reference [6] also investigate the relationship between technology context and social media adoption among SMEs in UAE and found the consistent result with [16]. reference [17] investigate the effect of technology context on social media adoption using Malaysia’s SMEs. They conclude that relative advantage and compatibility has significant relationship with social media adoption. The effect of technology context on social media adoption is not conclusive. Therefore, this study proposed the hypothesis that technology context has a positive relationship with social media adoption. Further, the proposed conceptual model is as follow.

![Technology Context](Technology Context)

![Social Media Adoption](Social Media Adoption)

**Figure 1. Research Framework**

### 2. Material and methods

This study uses SMEs owners or managers operating in west Sumatra province as research object. Primary data is used and collected through online survey. There are two types of variable used here: independent latent variable (technology context) and dependent latent variable (social media adoption). Technology context refers to any technology that is either used by the organization, or that is available, and is known to be potentially useful, but is not yet being used [18]. In this study, technology context has twenty four items which are developed by several authors [19]–[22]. Social media adoption has five items and adapt from [23]. Variables are measured by five-scale Likert ranging from strongly disagree and strongly agree. Data is analysed using SEM-PLS due to the conditions relating to sample size, normal distribution are not met [24], [25]. In smart-pls, there are two assessments to achieve the final result that are measurement and structural model [26]. The measurement model assessment has two type of validity test, that are convergent validity and discriminant validity [27]. Structural model assessment is conducted for hypothesis testing [28]. Predictive relevance and power have to be assessed before interpreting a path coefficient and p-value to decide to reject or accept the hypotheses.
3. **Result and Conclusion**

3.1. **Demographic Variables**

Small and medium enterprises (SMEs) participated in this study is twenty-eight. Based on type of social media adopted, eight small and medium enterprises are dominantly select WhatsApp to promote their business and product/services. Eleven (39%) SMEs use an Instagram. Followed by seven (25%) SMEs use Facebook. In addition, two SMEs do not provide us with information about type of social media being used. According to number of workers are employed by SMEs, twenty-three (82%) SMEs have workers less than ten workers. In addition, one SME has ten to fifty and greater hundred workers. Three SMEs do not supply this type of data.

**Figure 2.** Type of social media adopted (dominated) and number of workers

3.2. **Measurement Model Assessment**

Measurement model assessment consists of two validity assessment that is convergent validity and discriminant validity. Table 1 presents the result of convergent validity test. From outer loading, both construct has outer loading greater than 0.700 [29] after deleting two items for social media adoption, and four items for technology context. Second criteria for convergent validity test is assessing Cronbach's Alpha and Composite Reliability. Its value must be greater than 0.700 [30]. In addition, final assessment for convergent validity is average variance extracted (AVE) and its value must be greater than 0.500 [30].

**Table 1.** Measurement Model Assessment: Convergent validity

| Construct                  | Items     | Outer Loading | Cronbach's Alpha | Composite Reliability | AVE  |
|----------------------------|-----------|---------------|------------------|-----------------------|------|
| Social media adoption      | sma1      | 0.907         |                  |                       |      |
|                            | sma3      | 0.882         |                  |                       |      |
|                            | sma5      | 0.780         |                  |                       |      |
|                            | tcb1      | 0.853         | 0.982            | 0.983                 | 0.738|
|                            | tcb2      | 0.872         |                  |                       |      |
|                            | tcb3      | 0.722         |                  |                       |      |
|                            | tcb4      | 0.760         |                  |                       |      |
|                            | tco1      | 0.896         | 0.819            | 0.893                 | 0.736|
|                            | tco2      | 0.882         |                  |                       |      |
|                            | tco3      | 0.892         |                  |                       |      |
|                            | tco4      | 0.906         |                  |                       |      |
|                            | tco5      | 0.870         |                  |                       |      |
The second assessment for model is structural model assessment. There are at least two criteria’s that we have to evaluate: Fornell-Lacker criterion and cross-loading [31], [32]. Table 2 provides the result of Fornell-Lacker criterion. It can be concluded that measurement model has better discriminant validity due to the value of square AVE for construct social media adoption (bold, 0.859) is greater than correlation coefficient between social media adoption and technology context (0.647) [31].

Table 2. Discriminant validity-Fornell-Lacker Criterion

| Construct                  | Social Media Adoption | Technology Context |
|----------------------------|-----------------------|-------------------|
| Social media adoption      | 0.859                 |                   |
| Technology context         | 0.647                 | 0.858             |

Second assessment for discriminant validity is cross-loading. Table 3 shows the result of cross loading. Loading of items for social media adoption (sma1, sma3, and sma4) is higher than loading on other construct (technology context). Therefore, both constructs have achieved the discriminant validity requirement.

Table 3. Discriminant Validity-Cross Loading

| Items | Social Media Adoption | Technology Context |
|-------|-----------------------|-------------------|
| sma1  | 0.907                 | 0.511             |
| sma3  | 0.882                 | 0.613             |
| sma5  | 0.780                 | 0.530             |
| tcb1  | 0.461                 | 0.853             |
| tcb2  | 0.573                 | 0.872             |
| tcb3  | 0.358                 | 0.722             |
| tcb4  | 0.364                 | 0.760             |
| tco1  | 0.570                 | 0.896             |
| tco2  | 0.580                 | 0.882             |
| tco4  | 0.530                 | 0.906             |
| tco5  | 0.692                 | 0.870             |
| tob1  | 0.568                 | 0.916             |
| tob2  | 0.444                 | 0.790             |
| tob3  | 0.658                 | 0.889             |
| tob4  | 0.476                 | 0.902             |
| tr1   | 0.611                 | 0.893             |
| tr3   | 0.596                 | 0.928             |
| tra1  | 0.623                 | 0.847             |
| tra2  | 0.584                 | 0.868             |
3.3. Structural model assessment
Second assessment using smart-pls is structural model assessment. This assessment begins with evaluating the predictive relevance and predictive power. It continues to the hypothesis testing by using the path coefficient and \( P \) value [33]. The structural model has medium predictive relevance [34] and moderate predictive power [24].

| Endogenous Construct | \( Q^2 \) | Decision | \( R^2 \) | Decision |
|----------------------|----------|----------|----------|----------|
| Social media adoption | 0.268    | Medium   | 0.419    | Moderate |
| Relationship          | Path coef. | \( t \) statistic | \( P \) value | Decision |
| Technology context -> social media adoption | 0.647 | 8.756 | 0.000 | Supported |

Based on the result of \( t \) statistic, we can conclude that technology context has a positive relationship with the social media adoption among SME (\( p\)-value= 0.000, \( \beta \)=0.647). This finding is supported by previous research [17]. However, this result is not consistent compared to finding of [16]. Figure 2 provides us with structural model. Social media adoption is relatively low (means=2.76). Social media adoption is due to the perceived relative advantage, compatibility, complexity, trialability, and observability of social media. SMEs manager/owner believe that they will gain some benefit because adopt the social media. The benefit could be in term of business performance, financial gain and competitive advantage. Social media adoption by SMEs are due to fitness of social media with its business process, including with its suppliers and customers. Besides, social media adoption by SMEs is also perceived as something which is not complex and applicable to their current business. In addition, SMEs perceive that social media is easy to try and observe it.

![Figure 3. Structural model](image)

Note: latent variable 1 and 2 are technology context and social media adoption respectively.
4. Conclusion and recommendation

Business environment has been changing over the time. In strategic perspective, technology is one of the external environment factors (PEST) that have to be monitored their changes. This technology changes influence the way the business to be managed. It is usually an input in strategy formulation. In addition, technology should be accommodated into strategy, including in functional management, such as marketing. Social media is derived from digital marketing strategy. Social media adoption among large company has been explored. However, lack of prior study uses SMEs in Indonesia’s case. The result shows that social media adoption is determined by technology context. Due to technology advantage, compatibility, complexity, trialability and observability, SMEs tend to adopt the social media as a strategic tool to gain the competitive advantage. This finding contributes to the technology-organization-environment (TOE) model [15]. Practically, this finding can be used by SMEs owners/managers or other stakeholders to increase the social media adoption among SMEs. The SMEs stakeholders, such as local government, can increase the awareness of the important of a technology. This effort will change the attitude of SMEs owners/managers toward technology. If they have a positive attitude toward technology, they will tend to accept or adopt that technology. Our finding in this article is subject to a least three limitations. First, this study uses a limited number SMEs. Second, this study investigates the social media adoption for only one variable. Finally, this study sees the social media adoption from one perspective (TOE). Future research should therefore concentrate on investigation of social media adoption by adding other variables from other perspective. Besides, further investigation also can widen the number of SMEs participating in research.

References

[1] Anton SA, Muzakan I, Muhammad WF, Syamsudin, Sidiq NP. An Assessment of SME Competitiveness in Indonesia. J Compt. 2015;7(2):60–74.
[2] Muda I, Sihombing M, Jumilawati E, Dharsuky A. Ciritical sucess factors downstream palm oil based small and medium enterprises (SME) in Indonesia. IJER. 2016;13(8):3531–8.
[3] Tambunan T. Export-oriented small and medium industry clusters in Indonesia. J Enterprising Communities People Places Glob Econ. 2009;3(1):25–58.
[4] Constantinides E, Fountain SJ. Web 2.0 : Conceptual foundations and marketing issues. J Direct, Data Digit Mark Pract January. 2008;9(3):231–44
[5] Bernoff J, Li C. Harnessing the power of the oh-so-social web. MIT Sloan Manag Rev. 2008;49(3):36–42.
[6] Ahmad SZ, Bakar ARA, Ahmad N. Social media adoption and its impact on firm performance : the case of the UAE. Int J Entrep Behav Res. 2018;25(1):84–111.
[7] Ahmad SZ, Ahmad N, Bakar ARA. Reflections of entrepreneurs of small and medium-sized enterprises concerning the adoption of social media and its impact on performance outcomes : Evidence from the UAE. Telemat Informatics [Internet]. 2018;35:6–17.
[8] Bakri AA Al. The impact of social media adoption on competitive advantage in the small and medium enterprises. Int J Bus Innov Res. 2017;13(2):255–69.
[9] Ainin S, Parveen F, Moghavvemi S, Jaafar NI, Shuib NLM. Factors influencing the use of social media by SMEs and its performance outcomes. Ind Manag Data Syst. 2015;115(3):570–88
[10] McCann M, Barlow A. Use and measurement of social media for SMEs. J Small Bus Entrep Dev. 2015;22(2):273–87.
[11] Parveen F, Jaafar NI, Ainin S. Social media usage and organizational performance : Reflections of Malaysian social media managers. Telemat Informatics [Internet]. 2014;32(1):67–78. Available from: http://dx.doi.org/10.1016/j.tele.2014.03.001.
[12] Abeyesinghe G,Alsobhi AY. Social media readiness in small businesses. In: International Conference Information Systems [Internet]. 2013. p. 267–72. Available from: http://eprints.mdx.ac.uk/11433.
[13] Jagongo A, Kinyua C. The Social Media and Entrepreneurship Growth ( A New Business Communication Paradigm among SMEs in Nairobi ). Int J Humanit Soc Sci. 2013;3(10):213–27
[14] Sarosa S. Adoption of social media networks by Indonesian SME : A case study. Procedia Econ Financ [Internet]. 2012;4:424–54. Available from: http://dx.doi.org/10.1016/S2212-5671(12)00339-5.
[15] Tornatzky, Fleischer M. The processes of technological innovation. Lexington, MA: Lexington Books; 1990.
[16] AlSharji A, Ahmad SZ, Bakar ARA. Understanding Social Media Adoption in SMEs : Empirical Evidence from the United Arab Emirates. Int J Emerg Econ. 2018;10(2):302–28.
[17] Ahmad SZ, Bakar ARA, Faziharudean TM, Zaki KAM. An empirical study of factors affecting e-commerce adoption among Small and Medium-sized enterprises in a developing country : evidence from Malaysia. Inf
Technol Dev. 2014

[18] Zhu K, Kraemer KL. Post-adoption variations in usage and value of e-business by organizations: cross-country evidence from the retail industry. Inf Syst Res. 2005;16(1):61–84.

[19] Grandon EE, Pearson JM. Electronic commerce adoption: an empirical study of small and medium US businesses. Inf Manag. 2004;42:197–216.

[20] Al-qirim N. The adoption of eCommerce communications and applications technologies in small businesses in New Zealand. Electron Commer Res Appl. 2007;6:462–73.

[21] Lorenzo-romero C, Constantinides E, Brünink LA. Co-Creation: Customer Integration in Social Media Based Product and Service Development. Procedia - Soc Behav Sci [Internet]. 2014;148:383–96. Available from: http://dx.doi.org/10.1016/j.sbspro.2014.07.057

[22] Tan KS, Chong SC, Lin B, Eze UC. Internet-based ICT adoption: Evidence from Malaysian SMEs. Ind Manag Data Syst. 2009;109(2):224–44.

[23] Cesaroni FM, Consoli D. Are small businesses really able to take advantage of social media? Electron J Knowl Manag. 2015;14(4):257–68

[24] Chin W. The partial least squares approach to structural equation modeling in G. A. Marcoulides (Ed.). In: Modern methods for business research. London: Lawrence Erlbaum Associates; 1998. p. 295–236.

[25] Chin WW, Newsted PR. Structural equation modeling analysis with small samples using partial least squares. In: R. H. Hoyle (Ed.), Statistical strategies for small sample research (pp. 307 – 342). In: Structural equation modeling analysis with small samples using partial least squares In: R H Hoyle (Ed), Statistical strategies for small sample research. Thousand Oaks, CA: SAGE; 1999. p. 307–42.

[26] Hair JF, Hult GTM, Ringle CM, Sarstedt M. A primer on partial least squares structural equation modeling (PLS-SEM). Los Angeles: SAGE Publication; 2017. 390

[27] Vinzi VE, Chin WW, Henseler J, Wang H. Handbook of Partial Least Square: Concepts, Methods and Applications. Berlin, German: Springer; 2010. 791.

[28] Wong KK. Partial Least Squares Structural Equation Modeling (PLS-SEM ) Techniques Using SmartPLS. Mar bull. 2013;24:1–32.

[29] Hulland J. Use of partial least square (PLS) in strategic management research: a review of four recent studies. Strateg Manag J. 1999;20:195–204

[30] Bagozzi RR, Yi Y. On the Evaluation of Structural Equation Models. J Acad Mark Sci. 1988;16(1):74–94.

[31] Fornell C, Larcker DF. Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. J Mark Res [Internet]. 1981;18(3):382. Available from: http://www.jstor.org/stable/3150980?origin=crossref

[32] Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Sci. 2015;43:115–35.

[33] Hair J, Sarstedt M, Hopkins L, G. Kuppelwieser V. Partial least squares structural equation modeling (PLS-SEM)-An Emerging Tool in Business Resarch. Eur Bus Rev. 2014.

[34] Henseler J, Ringle CM, Sinkovics RR. The use of partial least squares path modeling in international marketing. Adv Int Mark. 2009;20:277–319