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Did Rural Micro-Entrepreneurs Do Make A Higher Gain? A Preliminary Study on The Potential of Supply Chain Digitalization Using PLS-SEM Approach

Adakah Usahawan Mikro Mendapat Keuntungan Yang Lebih? Analisis Preliminari Terhadap Potensi Digitalisasi Rantaian Bekalan Dengan Pendekatan PLS-SEM

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Abstract: Studies on digitalization disruption and its impact on business are gaining global attention, especially among small and medium entrepreneurs (SMEs). It is theoretically expected to be a business value add element in terms of capability and competitiveness in the supply chain ecosystem, which is fundamental in business success. But digitalization also has its own risks and challenges including expertise, capital, cooperation, incentives, and support from other economic units, such as other merchants and customer preferences. Failure in digitization can lead to mistrust and negative perceptions that may lead to effects the SME growth. Among the biggest digitalization challenges are for the rural micro-entrepreneurs (RME) who live in areas that lack digital support facilities and technological capabilities, such as a weak internet connection and native customer's desire to buy using online shopping platforms. This study will analyze the competitive level of RME businesses from a supply chain perspective. To analyze the impact of supply chain digitization (DSC), a mediator effect will be used. DSC will be applied in mediator effect to entrepreneurial supply chain towards the level of RME's business competitiveness. The hypothesis of this study is DSC practice has a role on the growth of RME business competitiveness. Using the Partial Lease Square-Structural Equation Modeling (PLS-SEM) method, this study found that RMC's efforts on business digitization do not have a significant impact on the development of business competitiveness. The hypothesis of this study was confirmed by the rate of P-value. While DSC mediator effect through variance accounted for (VAF) calculation found that there is low partial mediation (23%). This paper proposes a further study on the elements of competitiveness and the desire for digitalization of RMC to be investigated, while the current need for a comprehensive DSC model of RMC particularly, in line with rural economic development issues in Malaysia.

Keywords: Digitalization, Supply chain, Micro-entrepreneurs

Kajian mengenai gangguan digitalisasi dan kesannya terhadap perniagaan mendapat perhatian global, terutama di kalangan pengusaha kecil dan sederhana (PKS). Secara teorinya ia diharapkan dapat menjadi elemen tambah nilai perniagaan dari segi kemampuan dan daya saing dalam ekosistem rantai bekalan, yang merupakan asas dalam kejayaan perniagaan. Tetapi digitalisasi juga mempunyai risiko dan cabaran tersendiri termasuk kepakaran, modal, kerjasama, insentif, dan sokongan dari unit ekonomi lain, seperti pedagang lain dan pilihan pelanggan. Kegagalan dalam pendigitalan dan pendigitan boleh menyebabkan timbulnya ketidakpercayaan dan persepsi negatif yang boleh mempengaruhi pertumbuhan PKS. Antara cabaran digitalisasi terbesar adalah untuk pengusaha mikro luar bandar (RME) yang tinggal di kawasan yang tidak mempunyai kemudahan sokongan digital dan kemampuan teknologi, seperti kemamampuan akses internet yang relatifnya lemah dan keinginan pelanggan luar bandar untuk membeli menggunakan platform dalam talian. Kajian ini akan menganalisis tahap daya saing perniagaan RME dari perspektif rantaian bekalan. Untuk menganalisis kesan pendigitan rantaian bekalan (DSC), kesan mediator akan digunakan. DSC akan diterapkan dalam pengaruh mediator untuk

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rantaian bekalan keusahawanan menuju tahap daya saing perniagaan RME. Hipotesis kajian ini adalah amalan DSC berperanan dalam pertumbuhan daya saing perniagaan RME. Dengan menggunakan kaedah Partial Lease Square-Structural Equation Modeling (PLS-SEM), kajian ini mendapati bahawa usaha RMC terhadap pendigitan perniagaan tidak memberi kesan yang signifikan terhadap pengembangan daya saing perniagaan. Hipotesis kajian ini disahkan oleh kadar nilai-P. Sementara kesan mediator DSC melalui varians diperhitungkan (VAF) mendapati bahawa terdapat kadar pengantaraan hanya pada separa rendah (23%). Makalah ini mencadangkan kajian lebih lanjut mengenai unsur daya saing dan keinginan untuk digitalisasi RMC untuk diselidiki, dalam menyediakan pelan keperluan semasa untuk model DSC komprehensif RMC khususnya, sesuai dengan isu-isu pembangunan ekonomi luar bandar di Malaysia.

Kata Kunci: Digitalisasi, Rantaian bekalan, Usahawan mikro

Introduction

Rural micro-entrepreneurship (RME) always gaining attention in national economic development history, in terms of the welfare and sustainability of micro-scale business in Malaysia. Surrounding remote areas with no applicable facilities and convenience business support system, It is a crusade journey to ensuring the sustainability and survival of the poor in the disruption of major economic challenges, related to health care, education, and any social issues in rural society. Furthermore, entrepreneurship is now one of the highly encouraged approaches that are seen to be able to be applied by the poor. Theoretically, it is expected to secure them from the shackles of poverty and destitution, into the stability of wellness. Even so, the problems and challenges of entrepreneurship especially after the 2019 pandemic, saw a significant shift, towards digital entrepreneurship. While in the transition of digitalization, it requires a major change approach that includes organizational priorities, expertise, practices as well as norms and values of business management referred to as digital transformation (Sussan & Acs, 2017). Yet it requires a high cost and risk, the role of digital participant, supportive incumbents, consumer awareness, entrepreneurial experience, and other complex issues of digital adoption. Moreover, it has a wide range of different backgrounds of RME, options, and individual capabilities. This study will use quantitative methods with descriptive analysis from survey sources. In the construction of the model framework, thematic methods and statistical descriptive analysis will be used. This study will propose the level of impact of digital platforms in the development of the RME entrepreneurship supply chain and identify critical points in the DSC through the perspective of the RME. It can help RME in securing a competitive digital ecosystem. The results of this study can contribute to a comprehensive digital platform model specifically for RME entrepreneurs, in line with the government's plan in achieving the National Entrepreneurship Policy (DKN 2030).

Methodology

This study uses a non-parametric quantitative method with PLS-SEM approach, to obtain significant findings, namely the impact of DSC on the competitiveness of RMC. Quantitative analysis will be used in the acquisition of field survey forms. PLS-SEM non-parametric analytical approach used in the identification of significant factors and effects in the validation of the theoretical framework that has been constructed. A partial least square (PLS) was used to find the fundamental relationship between the two matrices representing each variable, i.e. the latent variable approach to model the covariance structure between these two regression spaces. The PLS model will attempt to find a multidimensional direction in space X that describes the direction of the maximum multidimensional variance in space Y. The PLS-SEM method provides comprehensive value for researchers because it is useful for analyzing complex models or structures. It can be carried out with a variety of variables and structural bands without embracing the separation of data distributions in different categories of variables (Hair et al., 2019). It is an approach that emphasizes the significance rate of forecasting, factors, and predictions in statistical estimation, whose structure is designed to provide an explanation in human behavior in the social sciences (Wold, 1982; Sarstedt et al., 2017a).

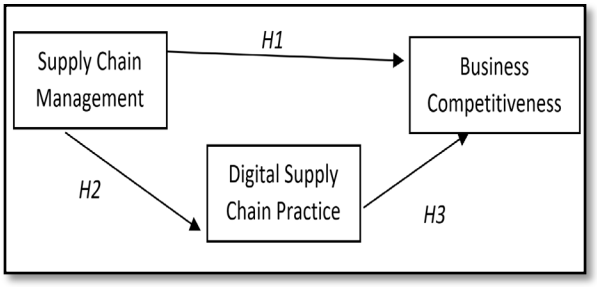
In terms of population and sampling, this preliminary study focuses on rural entrepreneurs in Kuala Tahan, Pahang. The specific geographical context was selected based on characteristics of the desired population, namely entrepreneurs who live in rural areas. Data and information of poor rural entrepreneurs are obtained from the State Islamic Religious Council (SIRC) from the year 2019 until 2021. The sampling technique is based on a convenience sampling technique where some areas in the state will be distributed survey forms by google form. Convenience sampling techniques are suitable for use with patterns of respondents from different geographies, and low cost. There is a total of 51

respondents (n = 51) who have filled in the survey form. Hence, this number is enough for a preliminary study to be done, which is more than 30 minimum respondents.

The data obtained from the survey form will be analyzed with PLS-SEM multivariate analysis method to produce study findings and validation of hypotheses. PLS-SEM (partial lease square-structural equation modeling) is widely used in social science disciplines, including organizational management and information systems (Ringle et al., 2019), marketing management (Hair et al., 2012b), and supply chain management (Kaufmann and Gaeckler, 2015). PLS-SEM analysis can be done with the help of Smart PLS software tool. In evaluating the validity and validation of each factor in the model, the AVE method will be used, apart from Cronbach's alpha, composite reliability, and convergence validity. While the determination of significant study results is with the parameters of P-value and T-test that can determine the effect of each variable.

In terms of research hypothesis, a conceptual framework was first constructed from the highlights of the DSC literature. The independent variable in this study is the RME perception and behavior towards the elements of the DSC platform. The dependent variable in this study is business competitiveness. Data collection is done by Google form questionnaires to RME in Kuala Tahan. In identifying the effect of DSC on RME performance, this study will use the mediator effect method. The method of identifying the validity and effect of the mediator is through the calculation of Variance Accounted For (VAF).

Figure 1.0: Theoretical framework



Through figure 1.0, the study has three parts of variables, namely supply chain as an independent variable, DSC as a mediator effect, and entrepreneurial competitiveness as a dependent variable. In this framework, three hypotheses are emerging, namely:

h_1: The RMC supply chain has a direct relationship to business competitiveness without the impact of DSC.
h_2: The RMC supply chain has a direct relationship to digital supply chain practice (DSC).
h_3: The RMC supply chain requires DSC as a significant mediation towards business competitiveness performance.

This research uses three levels of analysis, the first of which is the measurement of the construct model, using the reliability and validity test methods. The second stage is to identify the modeling path, to find out the significant results. while the third is hypothesis proof with effect mediator, through mediator analysis method and Variance Accounted For (VAF) percentage. The justification of this study is to use a reflective model, then the measurement of the validity of the study is through the analysis of reliability and validity in the reflective model. reliability test is with Cronbach's alpha instrument, average variance extracted (AVE), and R^2 assessment. While validity is with Convergence validity and Discriminant validity.

Result & Discussion

This study used the two-step approach as suggested by Anderson and Gerbing (1988). Firstly, the study of reflective measurement assessed convergent validity, reliability, and discriminant validity. Convergent validity can be ascertained if the loadings are greater than 0.5 (Hair et al., 2010). By default PLS-SEM does not produce any Goodness of Fit (GoF) value; therefore, R^2 value is often regarded as the main source, for assessing the most sought-after explanatory power of a proposed structural model (Hair et al., 2017; Henseler et al., 2016). In terms of reliability, the R^2 can measure the variance, which is explained in each of the endogenous constructs (Shmueli and Koppius, 2011). The R^2 is also referred to as in-sample predictive power (Rigdon, 2012). (Henseler et al., 2009; Hair et al., 2011). Cohen (1988) classified three categories of R-square, 0.02 weak, 0.13 moderate, and 0.26 substantial, thus based on the R-squared of this present study, BC and DSC it is found to be substantial and weak respectively.

Table 1.0: R-square

	R Square	R Square Adjusted
BC_	0.424	0.400
DSC	0.022	0.003

BC (business competitiveness), DSC (digital supply chain).

Table 1.0 shows the values of R^2 BC (business competitiveness) and DSC (digital supply chain). The two dependent variables have very different values. The R-square for BC was 0.424, indicating that each dependent variable could impact BC by 42.4%, compared to other factors of 57.6% that were not in this study. Still, it achieves the cut-off value required to be a substantial value of more than 0.26 (Hair, 2019). While DSC only reached R-square at 0.022. which showed only 2.2% of the influence of predictors on it. It shows a much weaker relationship than BC. However, based on Cohen (1988), the R-square rate of 0.13 and above is moderate and can be extended to path coefficient analysis. Hence, DSC does not show sufficient R-square value to be a factor to BC.

In terms of reliability analysis, Hair et al., 2012 suggest the use of composite reliability as a replacement of internal consistency reliability measuring in social science research, instead of to conventional Cronbach's alpha. Therefore, the present study uses it for measuring internal consistency reliability. In this case, the composite reliability coefficient measure of the internal consistency and reliability was assessed and reported in Table 2.0 below. In this present study, the composite reliability coefficient value ranges from 0.869 to 0.928 which is higher than the value of the minimum level of 0.7; this indicates the high level of internal consistency reliability (Hair et al., 2011; Bagozzi & Yi, 1988). Thus, it can be established that the instruments are reliable, as shown in Table 2.0 below:

Table 2.0: Convergent validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
BC_	**0.911**	**0.928**	**0.651**
DSC	**0.911**	**0.927**	**0.718**
SC	**0.820**	**0.869**	**0.572**

BC (business competitiveness), DSC (digital supply chain).

In the discriminant validity test, this study used the Heterotrait-monotrait (HTMT) criterion, and its value must be lower than 0.90 (Hair et al., 2016). HTMT is also used as an alternative to the Fornell & Larcker criterion (Hair, Ringle, & Sarstedt, 2011;Peterson & Kim, 2013;Ab Hamid, Sami, & Mohmad Sidek, 2017). As shown in Table 6 below, all HTMT value is lower than 0.90, which provide a significance discriminant validity of research construct.

Table 3.0: Heterotrait-monotrait (HTMT) criterion

	BC_	DSC	SC
BC_			
DSC	**0.316**		
SC	**0.608**	**0.245**	

BC (business competitiveness), DSC (digital supply chain), |SC (supply chain management).

Path Coefficients

R square (R^2). The contribution value of all variables can be seen through the R^2 values. The value of $R^2 > 0.67$ is strong, $R^2 > 0.33$ is moderate and $R^2 > 0.19$ is weak (Hair, 2016). The table 7 below shows that the model of this study has multiple result. Only SC to DC apparently have strong predictive power value of $R^2 = 0.824$, where the others are at par in weak predictive power of R^2, with 0.267 and 0.291.

Table 4.0: Path Coefficient

	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
DSC -> BC	0.290	0.201	1.770	**0.077**
SC -> BC	0.594	0.141	3.462	**0.001**
SC -> DSC	0.144	0.408	0.585	**0.559**

BC (business competitiveness), DSC (digital supply chain), |SC (supply chain management).

In table 30 show path coefficients containing several types of coefficient test. Sample Mean (β) indicates the expected variation in the dependent variable with a single variable in each variation unit (Henseler et al., 2015). The value of β of each pathway in the hypothesis model should be calculated in determining the significance of study hypothesis. The higher value of β, the more significant its effect on endogenous latent construct (Hair, 2014). However, the value of β needs to be confirmed for its importance through a T-statistical test where the value of T should exceed 1.69. To test the importance of path coefficients and T-statistics, a bootstrap procedure was performed. Table 4.0 shows coefficient result, only SC->BC show decent coefficient value (T=3.462;P-

value=0.001), while others two path does not reach a significant coefficient value namely DSC -> BC (T-value=1.770;P-value=0.077) and SC -> DSC (T-value=0.585;P-value=0.559).
VAF calculating formula:

$$\text{VAF} = \frac{\text{Indirect effect}}{\text{Total effect}} = \frac{a\,x\,b}{a\,x\,b + c}$$

Thus, the VAF calculation of mediation effect is:

(0.585 x 1.770)/ (0.585 x 1.770) + 3.462……(1)
1.035/ (1.035+3.462) ……..(2)
1.035/4.497……..(3)
0.23 x 100……..……(4)
= 23% #

A situation in which the VAF is larger than 20 percent and less than 80 percent could be characterized as a typical partial mediation (Hair et al., 2017). Through the results of the VAF calculation, there is only 23% of the DSC mediator effect on the competitiveness of RME. This shows that DSC practice has minimal effect in its influence on business competitiveness of RME.
Meanwhile, the predicted hypotheses of this study are:

i. *H1: The RMC supply chain has a direct relationship to business competitiveness without the impact of DSC.*
ii. *H2: The RMC supply chain has a direct relationship to digital supply chain practice (DSC).*
iii. *H3: The RMC supply chain requires DSC as a significant mediation towards business competitiveness performance.*

Hence, the results of the study in Table 10 show that only H1 is accepted which confirms that the conventional supply chain factors in RMC have a significant relationship in affecting business competitiveness with p-value = 0.001 <0.05 whereas H2 and H3 have no significant relationship in affecting career challenges, with p > 0.05, as shown in Table 5.0 below:

Table 5.0: Summary of the hypothesis

Ho	Path	Sample Mean (M)	T Statistics	P Values	Result
H1	**SC -> BC**	0.594	3.462	**0.001**	**Supported**
H2	**SC -> DSC**	0.144	0.585	**0.559**	**Not supported**
H3	**SC-DSC-BC**	0.014	0.706	**0.481**	**Not supported**

BC (business competitiveness), DSC (digital supply chain), |SC (supply chain management).

The results of this preliminary study specific to the RME in Malaysia do not support the findings from previous studies from the OECD (2017), Verhoef, et al., (2019), and Bouman (2019) that suggest digitalization provides competitive value to SMEs including the RME. Thus, this paper suggests only H1 are supported, which is supply chain management shows a significant relationship. As things go, supply chain management can increase the competitiveness of RME without DSC practice. This may be due to several factors of digitalization incompatibility with other market units in RME environment that still lack such technological equipment, feasibility and facilities, not to mention the DSC unit that may be limited in their area, such as logistics delivery support and transportation of goods. While for the analysis of mediator effect strength with VAF approach, this paper found that there were only 23% of DSC mediator effects indicating the presence of weak and almost insignificant mediation. This paper issues some research questions that can be used in future research. The first is the perception of inland entrepreneurs towards business digitization, what are the obstacles and challenges against them when starting to move towards business digitization.

Conclusion

This preliminary study is to see the impact of supply chain digitization on rural entrepreneurs in Malaysia. With a total of 51 respondents in the district of Kuala Tahan in the interior of Pahang, Malaysia, this study found that RME had little impact from the digitization of their business. This may be due to their unavailability factors as well as consumers as well as buyers of their products who still do not use digital platforms in their day-to-day transactions. This study opens to some key problems and questions that can be studied in an effort to help the RME be more competitive through technology in the future, that is, what is the best adoption model in ensuring the existence of a digital ecosystem in rural areas, covering the facilities, readiness and behavior of RME and consumers. The results of this study can also have an impact on other parties in opening new dimensions in the digital supply chain in rural areas, which their welfare and economic capabilities are often marginalized from those in urban and sub urban areas.

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