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SMALL AND MEDIUM ENTERPRISES' BUSINESS SUSTAINABILITY BASED ON THE INDUSTRY 4.0 INTERNET OF THINGS ADOPTION: A MALAYSIAN BUMIPUTERA CASE STUDY

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Abstract

Companies of all sizes, including Small and Medium Enterprises, have been left with few choices for preparing for and implementing changes. This research gathered information to provide the theoretical framework on the determinants that Malaysian Bumiputera SMEs are relying on for their decision to adopt or not to adopt IoT in their business operations. Bumiputera refers to the indigenous people of Malaysia. The study utilised a cross-disciplinary study design. The data was obtained from company proprietors in Malaysia that operate in the category of Bumiputera SMEs and was statistically analysed using IBM's SPSS and AMOS software. According to the initial findings, it can be seen that respondents are very excited about the benefits of IoT, but lack the imagination to pioneer the arrangement. Furthermore, even though respondents are unconcerned about IoT, it gives the appearance of being unsure, leading them to think further on whether to trust it or not. It was also shown that top organizations have an increasingly good intuition of IoT, but also a progressively negative intuition of it. It is recommended that SMEs holistically, especially Bumiputera SMEs, acquire more knowledge and be prepared to expand the grasp of productive factors of IoT in Malaysia.

Keywords: Small and Medium Enterprises (SMEs), Bumiputera SMEs, Business Sustainability, Industry 4.0, The Internet of Things (IoT), TOE Framework

1. INTRODUCTION

Focussing on helping Bumiputera small and medium enterprises (SMEs) with the consideration of every other element in Malaysian economics, will indeed be a great step taken to secure a holistic business performance within the country. According to the Malaysian Credit Guarantee Corporation Report (2019), SMEs

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contribute a value of US$126.3 billion in terms of Malaysia's GDP, which is a rise of 38.3%. Bumiputera SMEs are said to make up of at least 40% of these SMEs. Therefore, Bumiputera SMEs should realise that the way forward is to adopt IoT in their business operations (Yassin, 2020), for them to at least compete for their survivability in the industry (Zainol et al., 2018).

The research scrutinized the determinants of IoT reception in acquiring in the exhibition of SMEs, the view of Bumiputera SMEs proprietors on the pertinence and versatility of the advancements in the described Malaysia business climate. Explored what are the determinants on considerations whether or not to adopt IoT in their business operation (Nagy et al., 2018). Adopting IoT might provide a wide variety of benefits for organizations and the resulting big data offers the probable for organizations to acquire valuable insights.

The overall objective of the study is to increase the resilience of Bumiputera SMEs towards future business risks and market competition. It seeks to investigate the factors of adoption and acceptance of the Internet of Things (IoT) among Malaysian SMEs. From the objectives, five Research Questions (RQ) have been derived specifically. This study seeks to answer the following research questions:

RQ1 What are the problems encountered in adopting IoT among Bumiputera SMEs in Malaysia?

RQ2 What are the determinants that drive the adoption decisions of IoT in Malaysia by a Bumiputera SME?

RQ3 What is the extent of IoT adoption among Bumiputera SMEs in Malaysia, making them sustainable in the industry?

RQ4 What are the insights within a business transformation that leads to IoT adoption by a Bumiputera SME?

RQ5 What are the moderating effects between owner demographic characteristics and IoT adoption among Bumiputera SMEs?

2. EXPERIMENTAL

The research topic is focused on a subgroup of the overall SMEs established in Malaysia, where confirming the factors that hinder the possibilities for the Bumiputera SMEs from adopting IR4.0 technologies in terms of IoT, will most probably help with its acceptance (Clarke, 1999). Thus, when these groups of SMEs are more intensified in adopting IR4.0 technologies such as IoT, it will drive them towards business sustainability.

The study adopted questionnaires as the instrument to collect primary data from targeted Bumiputera SMEs' respondents, where, the literature review approach was used for collecting secondary supporting data and insightful data on the research occurrences. It utilized quantitative approaches to gain a deeper understanding as well reaching the objective of confirming the determinants as the causal effects of the problem and if the moderating aspect has affected events concerning IoT adoption by these SMEs (Khoo et al., 2016). The questionnaires consist of a series of targeted 5 Likert scale questions that acquire the respondents to choose the level of agreement about the statement given. The 5 Likert's scale was scaled from "Strongly Disagree" to "Strongly Disagree". The set of questions was adapted from previous studies according to the variables that were classified within the TOE frameworks which included knowledge, awareness, organizational

change, adhocracy and business transformation. While the demographic data was also collected through the categorical questions set at the beginning of the questionnaire.

There are 1,151,339 SMEs in Malaysia, and 40% of them are Bumiputera SMEs, which comes to 460,536 establishments. This means, with a confidence level of 95% and confidence interval (Margin of Error) of 5, there was an expected response rate of 20% of the samples picking an answer. The sampling technique used was non-probability purposive sampling (Cochran, 1977), where the sample size was chosen from a targeted group of Bumiputera SMEs taken from numerous listings in various governmental agencies and associations. A sample size of 384 samples was needed as the research justification.

This study will be focusing on the effects of technological, organizational, and environmental (TOE) factors on the adoption of IoT by Bumiputera SMEs. The decision of TOE framework and development (as prior referenced) was accomplished by hypothetical justifications, similar to the particular application of IoT with regards to the business activities of Bumiputera SMEs.

The conceptual framework, as shown in Figure 1, illustrates the variables that specify the problem and give the direction of the study. It is an adoption of the TOE model (Tornatzky & Fleischer, 1990), and these variables are some of the important aspects that can influence the decision-making process of adopting the technology by any organization (Zhu, Kraemer & Xu, 2002). The independent variables include Knowledge (Tehseen et al., 2019), Awareness (Barroga et al., 2019), Organization Change (Giorgia & Di Maria, 2019), Adhocracy (Sanchez-Baez et al., 2019), and Business Transformation (Chin & Lim, 2018). While Demographic data (Barroga et al., 2019) including age, gender, education level and marital status, will be

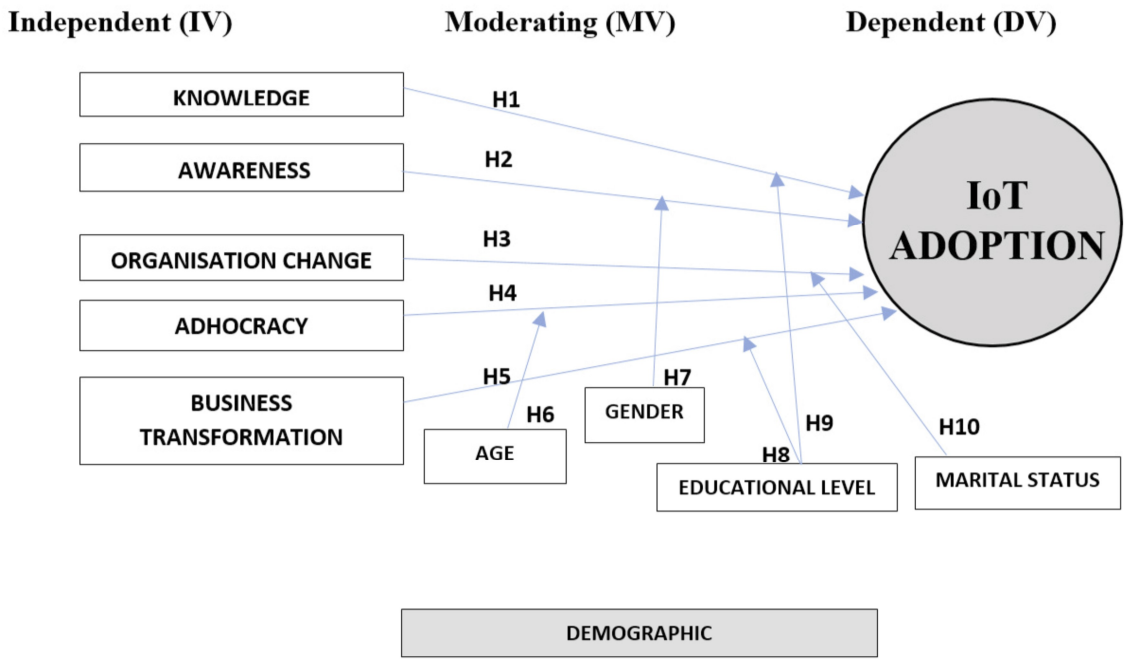

Figure 1. Conceptual Frameworks Based on the TOE Model

used as moderation variables to analyse the intervention effects of IV to DV. The theories regarding the moderation effects were set in a pair of 5 hypotheses, comprising of H6 (Adhocracy to IoT Adoption by Age), H7 (Awareness to IoT Adoption by Gender), H8 (Knowledge to IoT Adoption by Educational Level), H9 (Business Transformation to IoT Adoption by Educational Level), and H10 (Organization Change to IoT Adoption by Marital Status). The collected data was processed using SPSS 26 and AMOS 26, that had generated the required outcomes to be analysed.

3. RESULTS

The outcomes somewhat contradicted the findings from previous studies on innovation adoption in SME organizations. Analysis of secondary data has confirmed the potential and relevance of the Technology, Organization, and Environment (TOE) framework in explaining innovation adoption issues in SMEs. There were 386 selected questionnaire responses chosen after carefully examining for errors and due diligence. There was no missing data, and a 39% response rate was recorded.

3.1. Descriptive Analysis

Most of the respondents in this analysis were from the age group of 35-44 years, with 129 respondents (33.4%), trailed by the age group of 25-34 years. Age groups of under 24 years, 41-50 years, or more than 55 years, were in minority. Female respondents were 224 (58.0%) in number, with 162 (42.0%) male respondents. 108 respondents were single, 265 were married, and 12 respondents were separated, and 1 widowed, which equates to percentages of 28.0%, 68.7%, 3.1%, and 0.3%, respectively. Most of the respondents were bachelor's degree holders. Followed by diploma holders, with 101 respondents, addressing 26.2% in this analysis. Secondary school certificate holders were positioned third (22.8%), and master's degree holders at fourth (6.7%).

3.2. Normality Test and Model Fit

Data was normally distributed according to the normality test using skewness & Kurtosis results in AMOS. Figure 2 depicts the final model fit after it has been through a deletion as well as re-correlating process and has passed the goodness of fit (GOF) standard estimate. The GOF results show the best fit for this model that allows the statistical process to be conducted. The main indicator is that any three aspects from GFI, AGFI, CFI, IFI, NFI, and TLI should be more than 0.9, and the RMSEA value should be below 0.08, which this model is indicating.

3.3. Hypotheses' Analysis Results

The importance level for all relationship coefficients was set at the 0.05 level (2-tailed). A few presumptions should be consented including that samples are arbitrary and from free perception. Five factorial plus five moderating relationship coefficients were tested employing SPSS and AMOS. The strength of the relationship is still up to the standard proven through the correlation (r). Table 1 indicated the test results of the "supported" or "not supported" hypotheses.

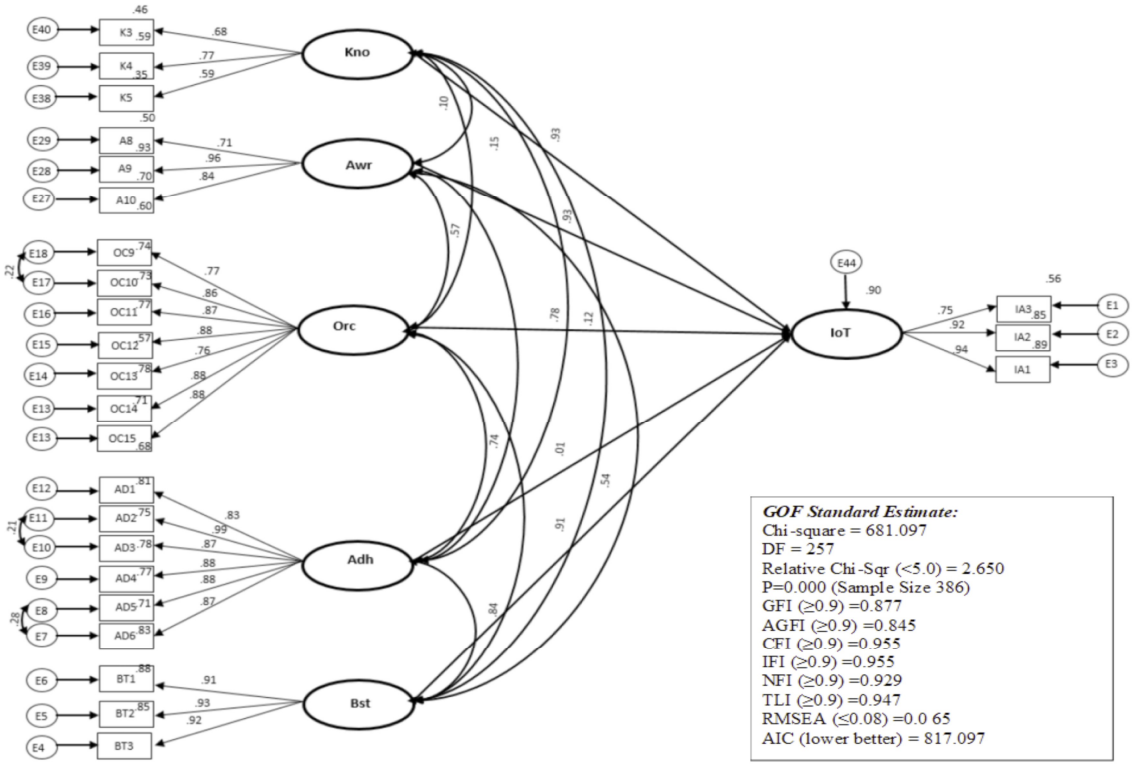

Figure 2. AMOS Modified Model Fit and GOF

4. DISCUSSION

The study aims to examine the decision-making process of adopting IoT in Bumiputera SMEs' business operations through the TOE theoretical framework. The findings exhibited a distinct trend of the respondents to truthfully answer the survey questionnaires as intended. The tested factors included knowledge, awareness, organization change, adhocracy, and business transformation involving SMEs in Malaysia.

4.1. Main Results

The main results will be answering the research questions that have been noted in the introductory part of the article. These results have been thoroughly discussed according to their relation to the hypotheses setup of the research.

RQ1 *What are the problems encountered in adopting IoT among Bumiputera SMEs in Malaysia?*

Hypotheses H1 and H2, which focus on the knowledge and awareness aspect, were not supported as per what the findings indicated. Both, according to the previous study, should have yielded the expected result as in Barroga et al. (2019), where it was shown that knowledge and awareness had been significantly supported. As asserted by Woon et al. (2019), majority of the SME businesses do not consider digitalizing their businesses. As stressed by a

Table 1. Research Summary of Hypotheses Status

	HYPOTHESIS	P-Value	STATUS
H1	There is a significant relationship between knowledge and IoT adoption in Bumiputera SME.	0.220	Not Supported
H2	There is a significant relationship between IoT awareness and IoT adoption in Bumiputera SME.	0.302	Not Supported
H3	There is a significant relationship between organisation changes and IoT adoption in Bumiputera SME.	***(<0.001)	Supported
H4	There is a significant relationship between adhocracy and IoT adoption in Bumiputera SME.	0.779	Not Supported
H5	There is a significant relationship between business transformation and IoT adoption in Bumiputera SME.	***(<0.001)	Supported
H6	There is a significant influence of age, of the owner moderating the adhocracy factors on IoT adoption in Bumiputera SME.	0.996	Not supported
H7	There is a significant influence of gender of the owner moderating the awareness factors on IoT adoption in Bumiputera SME.	0.065	Not supported
H8	There is a significant influence of educational level of the owner moderating the knowledge factors on IoT adoption in Bumiputera SME.	0.208	Not supported
H9	There is a significant influence of educational level of the owner moderating the Business Transformation factors on IoT adoption in Bumiputera SME.	0.254	Not supported
H10	There is a significant influence of marital status of the owner moderating the organisational changes factors on IoT adoption in Bumiputera SME.	0 .015 (<0.05)	Supported

few studies, it could be because of the way that the Bumiputera SMEs now and again battle with modernised developments (Omar & Azmi, 2015; Jomo, 2019). Research Question 1 establishes the inquiry regarding the issues which are experienced by Bumiputera SMEs that are keeping them away from taking on such innovation. From the outcome, it can be seen that the connection of knowledge to IoT adoption is in an unfavourable relationship (- 0.034), which is demonstrated from the sample size, where knowledge about IoT is extremely low or non-existent. Awareness on the other hand is at 0.031, showing signs that Bumiputera SMEs have exceptionally low awareness about IoT technology. Both factors demonstrate that they are not essentially influencing IoT reception, where the p-value is higher than > 0.05. Bumiputera SMEs are battling with innovation as far as their skills allow, and for

the most part, are ignorant with regards to the most recent innovations that exist around us. Perhaps there are deficiencies in specific regions, such that associated agencies or associations could realign the way that the projects have been set up, to suit the overall necessities of SMEs.

RQ2 *What are the determinants that drive the adoption decisions of IoT in Malaysia by a Bumiputera SME?*

Organizational change (H3) and business transformation (H5) have shown huge (<0.001) impacts on IoT reception in this study, with organizational change having a moderately little definite relationship to IoT reception at r = 0.180, and business transformation having an extremely high relationship to IoT reception, at r = 0.767. Other elements such as knowledge (r = -0.034), awareness (r = 0.031), and adhocracy (r = 0.014), have shown an insignificant level of relationship with IoT reception, with the score for all the components not being high (p > 0.05) in the relationship. According to Maldonado-Guzman et al. (2019), the technological competency of an organization can improve the effectiveness of SMEs and accomplish competitive advantage. On the other hand, development and modernization have been consolidated as one of the key angles in improving SME competitiveness (Chin & Lim, 2018). Research Question 2 findings focus on the potential determinants that Bumiputera SMEs could consider while settling on such choices, so as to embrace another innovation like IoT. Accepting the advancements in Internet of things (IoT) offers new measurements for Bumiputera SMEs to recognize and manage operations and unassuming everyday business experiences (Shetty, 2018). The assessment confirms that transformations and changes of the organization are driven by the reception to new advancements such as IoT (Molino et al., 2020). It is significant for information about changes to be diverted and set up across all the representatives of the organization together, for realizing the fruits of innovation advancement.

RQ3 *What is the extent of IoT adoption among Bumiputera SMEs in Malaysia, making them sustainable in the industry?*

According to Table 1, H3 was supported and H4 (r = 0.014, p = 0.779) was not supported. It emphasized on how an organization accepting changes will have a positive effect on the business. The workers' viability increments with the adjustment of mentalities and acknowledgement of another plan of action or structures. This was characterized by the discoveries identified with the relationship of organization changes (= 0.180). However, it is not a particularly solid relationship, notwithstanding the fact that it is profoundly huge (<0.001) or short of what is an extremely rare shot at being off base. This means that the organization's change mirrored that the business was taking on a new type of development into the organization, which was acknowledged by the workers. However, adhocracy wise, it is not something that is open for consideration yet. As indicated by Sanchez-Baez et al. (2019) the social relationships with SMEs in Paraguay are potentially different from the Bumiputera SMEs business culture in Malaysia. The capacity of an organization to amplify business innovation is brought about by adhocracy, trailed by market culture, and has an immediate and positive association. Here the findings show that there is no huge impact when entrepreneurs are having an undulant lay disposition inside the organization. The employees will work appropriately when they are not directed, as shown by the connection of r = 0.014. This

implies that just 1.4% of the adhocracy level required in a Bumiputera SMEs business climate to endure the employees is useful, and this would not be lessened nor upgraded much. It may very well be some different factors separated from adhocracy that embroil more on the conduct of the workers in terms of efficiency that ought to be concentrated in the future.

RQ4 *What are the insights within a business transformation that leads to IoT adoption by a Bumiputera SME?*

The assessment of how a business transformation is influenced by the adoption of IoT in Bumiputera SMEs prompts its progression. Business transformation, management wise, incorporates the carrying out of fundamental upgrades in how a business is directed to help adjust to shifts in the market environment. It is an adjustment of how the business activity is administered in terms of methodology, which can be portrayed as any shift, realignment, or key change in business assignments (Priyono et.al., 2020). There are numerous change materials accessible as a structure of references, yet there is no "one size fits all arrangement" along these lines (Björkdahl, 2020). The sample size represented that the business digitization change based advancement is the rule driver behind the change in essentially all business structures (Rachinger et al., 2019). Bumiputera SMEs taking part in local or worldwide business specifically have no other options than to recognise IoT as the changed plan of action, to be economical, and to keep up with the competition (Umrani & Johl, 2018). The findings shown that business transformation (H5) is supported, where $r = 0.767$ and $p < 0.001$ and adhocracy (H4) was not. It is an extremely astonishing connection between business transformation and IoT adoption with the degree of significance is exceptionally high at $p < 0.001$, however, Bumiputera SMEs needed to increase the adhocracy level to generate more support by the employees to get to initiate the change. Where committed employees usually are more engaged to the organization.

RQ5 *What are the moderating effects between owner demographic characteristics and IoT adoption among Bumiputera SMEs?*

Eventually, the final assessment is about the proprietor of the Bumiputera SMEs' socioeconomics' characters directing the impact on IoT selections to recognize which are the directing impacts between proprietor segment qualities or demographic traits and IoT adoption among Bumiputera SMEs. From the two sets of findings, it was discovered that H6, H7, H8, and H9 were not supported. Additionally, the findings from Ghattas and Al-Abdallah (2020) for the all-out balance had a comparative result, with a relationship to clients' decisions. A couple of connections are surely to intellectually impact how an individual is acting in the workplace (Bulińska-Stangrecka & Bagieńska, 2021). This correlation shows that there is no critical connection between the said segment factors on the IV toward IoT adoption (DV). The majority of the proprietors of the Bumiputera SMEs in Malaysia are between the ages of 25 and 44, but age does not affect adhocracy relationship to IoT adoption. The degree of consciousness of the two sexes also does not criticise or permit any reception choice that will build the possibility of deciding to adopt IoT. This may be because of the way that the rates of male (42%) and female (58%) reaction contrasts were not that conspicuous as far as reaction contrasts are concerned. It is important to ponder over that, if a similar

study were conducted in a greater extension, for example, for the entirety of the SMEs in Malaysia, would the outcome be something very similar or not?

Having great family ties (Marital Status), on the other hand, resembles having a mini organization. 69% of respondents were married, which likewise adds to the insignificance, shifting towards having effects on organization changes to the relationship with IoT adoption (H10). It was concluded that the best procedure for this investigation is to pick the findings from Hayes's SPSS process outcomes. This is due to the "error" in correlation computation that seems to lead to AMOS eliminating the classifications of "Widowed" from the categorical records. It is anything but random; however, the approach has confirmed the outcomes twice. AMOS would not consider the unmitigated viewpoint for this situation, i.e., Doctorate Level (5 reactions) and Widowed (1 reaction), when it is processing the relationship that is too diminutive based on the responses gathered.

5. SUGGESTION FOR FUTURE RESEARCH

Based on the interaction with this research for more than two years, there are a few viewpoints that can be worked on to make future research possible on this topic or extend the study in regard to Bumiputera SMEs, which could be something that is more exact and more significant to address the entire populace. Before the Covid-19 pandemic, most SMEs were doing very well in advancing with business development. When the pandemic hit, things changed quickly, and numerous organizations were abandoning the practice of making benefits into profound obligations, or even failing. Without any additional analysis profound enough into this scope of entrepreneurial business, and the management concerning the extent of innovation adoption, the entirety of the stakeholders would not be able to comprehend numerous angles identified regarding the subject of Bumiputera SMEs.

6. CONCLUSIONS

This research has given the Bumiputera SMEs some understanding of IR4.0, especially regarding IoT reception, and has provided the government agencies and related associations with insight on how to assist the businesses. It has demonstrated that age, sex, and education level does not direct the dynamic interaction, but decent family ties do. The study explores the knowledge, awareness, organization change, adhocracy, and business transformation perspective on the choice to take on IoT. With this information, the organizations can foster more efficacious and alluring knowledge and awareness programmes to help the Malaysian Bumiputera SMEs in making their businesses more sustainable.

References

Barroga, K.D., Rola, A.C., Depositario, D.P.T., Digal L.N., & Pabuayon, I.M. (2019). Determinants of the Extent of Technological Innovation Adoption Among Micro, Small, and Medium Food Processing Enterprises in Davao Region, Philippines. Philippine Journal of Science, 148 (4), 825-839.

ОДРЖИВОСТ ПОСЛОВАЊА МАЛИХ И СРЕДЊИХ ПРЕДУЗЕЋА ЗАСНОВАНИХ НА ПРИМЕНИ ИНТЕРНЕТА СТВАРИ ИНДУСТРИЈЕ 4.0 : СТУДИЈА СЛУЧАЈА МАЛЕЗИЈСКОГ БУМИПУТЕРА

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Извод

Компанијама свих величина, укључујући мала и средња предузећа, остављено је мало избора за припрему и имплементацију промена. Ово истраживање је прикупило информације како би пружио теоријски оквир о детерминантама на које се мала и средња предузећа Малезијски Бумипутери ослањају у својој одлуци да усвоје или не усвоје ИоТ (енг. Internet of Things) у својим пословним операцијама. Бумипутери се односе на домородачко становништво Малезије. Студија је користила међудисциплинарни дизајн студије. Подаци су добијени од власника компанија у Малезији који послују у категорији БумипутераМСП и статистички су анализирани коришћењем IBM-овог SPSS-а и AMOS софтвера. Према почетним налазима, може се видети да су испитаници веома узбуђени због предности ИоТ-а, али им недостаје идеја да постану пионири у уређењу. Штавише, иако испитаници нису забринути за ИоТ, запажа се утисак несигурности, што их наводи да даље размишљају да ли да верују у ИоТ или не. Такође се показало да врхунске организације имају све бољу интуицију о ИоТ-у, али и прогресивно негативну интуицију о томе. Препоручује се да мала и средња предузећа холистички, посебно мала и средња предузећа Бумипутера, стекну више знања и буду спремна да прошире схватање продуктивних фактора ИоТ-а у Малезији.

Кључне речи: мала и средња предузећа (МСП), МСП Бумипутер, пословна одрживост, Индустрија 4.0, Интернет ствари (ИоТ), ТОЕ оквир

Björkdahl, J. (2020). Strategies for digitalization in manufacturing firms. California Management Review, 62 (4), 17–36.

Bulińska-Stangrecka, H., & Bagieńska, A. (2021). The Role of Employee Relations in Shaping Job Satisfaction as an Element Promoting Positive Mental Health at Work in the Era of COVID-19. International Journal of Environmental Research and Public Health, 18 (4), 1903.

Chin, E.-W., & Lim, E.-S. (2018). SME Policies and Performance in Malaysia, Economic Working Paper (No.2018-3), Yusof Ishak Institutes (ISEAS) Singapore.

Clarke, R. (1999). Internet privacy concern confirm the case for intervention communication. ACM, 42, 60–67.

Cochran, W.G. (1977). Sampling Techniques (3rd edition). John Wiley &Sons, New York.

Credit Guarantee Corporation. (2019). Annual Report 2019 - Credit Guarantee Corporation, pp. 4. Credit Guarantee

Corporation Malaysia Berhad.

Ghattas, D.A., & Al-Abdallah, G.M. (2020). Factors affecting customers' selection of community pharmacies: The mediating effect of branded pharmacies and the moderating effect of demographics. Management Science Letters, 10 (8), 1813-1826.

Giorgia, Z., & Di Maria, E. (2019). Is the internet of things the catalyst for product innovation in the italian manufacturing?, Universita' Degli StudI Di Padova Dipartimento Di Scienze Economiche Ed Aziendali, Italy.

Jomo, K.S. (2019). Southeast Asia's Misunderstood Miracle: Industrial Policy and Economic Development in Thailand, Malaysia and Indonesia, Routledge.

Khoo, V., Ahmi, A., & Saad, R.A.-J. (2016). A Comprehensive Review on E-Commerce Research, Proceedings of the 3rd International Conference on Applied Science and Technology (ICAST'18) AIP Conf. Proc. 2016.

Maldonado-Guzman, G., Garza-Reyes, J.A., Pinzon-Castro, S.Y., & Kumar, V. (2019). Innovation capabilities and performance: Are they truly linked in SMEs? International Journal of Innovation Science, 11 (1), 48–62.

Molino, M., Cortese, C. G., & Ghislieri, C. (2020). The Promotion of Technology Acceptance and Work Engagement in Industry 4.0: From Personal Resources to Information and Training. International Journal of Environmental Research and Public Health, 17 (7), 2438.

Nagy J., Oláh J., Erdei E., Máté D., & Popp J. (2018). The Role and Impact of Industry 4.0 and the Internet of Things on the Business Strategy of the Value Chain—The Case of Hungary. Sustainability, 10 (10), 3491.

Omar, C.M.Z.C., & Azmi, N.M.N. (2015). Factors Affecting the Success of Bumiputera Entrepreneurs in Small and Medium Enterprises (SMEs) in Malaysia. Journal of International Business Research and Marketing, 1(9), 40-45.

Priyono, A., Moin, A., & Putri, V.N.A.O. (2020). Identifying Digital Transformation Paths in the Business Model of SMEs during the COVID-19 Pandemic. Journal of Open Innovation: Technology, Market, and Complexity, 6 (4), 104.

Rachinger, M., Rauter, R., Müller, C., Vorraber, W., & Schirgi E. (2019). Digitalization and its influence on business model innovation. Journal of Manufacturing Technology Management, 30 (8), 1143-1160.

Sanchez-Baez, E. A., Fernandez-Serrano, J., & Romero, I. (2019). Organizational culture and innovation in small businesses in Paraguay. Regional Science Policy and Practice, 1–15.

Shetty, P. (2018). Internet of things and digital transformation. Wharton Magazine.

Tehseen, S., Ahmed, F.U., Qureshi, Z.H., Uddin, M.J., & Ramayah, T. (2019). Entrepreneurial competencies and SMEs' growth: the mediating role of network competence. Asia-Pacific Journal of Business Administration, 11 (1), 2-29.

Tornatzky, L.G., & Fleischer, M. (1990). The Process of Technological Innovation, Lexington books, Lexington, MA.

Umrani, A. I., & Johl, S.K. (2018). How Different Ownership Structures Perform in Industry 4.0: A Case of Malaysian Manufacturing SMEs. Academic Press.

Woon, B.C., Kei, C.W., May, L.S., Yi, T.Y., & Mei, T.J. (2019). Reasons Against Audit Exemption Among SME. Academic Press.

Yassin, M. (2020). The Future Is in

Technology: Sunday Star (6 Dec. 2020), The Star Press.

Zainol, Z., Osman, J., Shokory, S.M., Samsudin, N., & Hashim, A. (2018). Sustainable Growth of High-Performing Bumiputera SMEs: Malaysian Perspectives. International Journal of Academic Research in Business and Social Sciences, 8 (2), 557–569.

Zhu, K., Kraemer, K., & Xu, S. (2002). A cross-country study of e-business adoption using the technology-organization-environment framework. Proceedings of the International Conference on Information Systems, Barcelona.