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Exploring Extended Configuration of Digital Eco-Dynamic Influence on Small E-Business' Product Innovation

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Abstract— This study comprehensively explores the factors affecting product innovation performance in small e-businesses. The effects of the broader composition of digital eco-dynamics on the performance of product innovation of small businesses are little understood. This study tries to fill in the gaps and investigate the interdependencies above. This study offers the novelty of using RICH as a construct that can improve innovation performance, expanding on a digital eco-dynamic that has not been developed for ten years. Confirmatory factor analysis, descriptive statistics, construct reliability, average variance extracted, and the RMSEA model of fit test was used to analyze data from 300 useable responses. The test reliability and validity of the empirical model were evaluated through linguist reviews and statistically tested with construct reliability coefficients and confirmatory factor analysis. The findings also suggest that IT capability, dynamic capability, environmental uncertainty, and resource induce coping heuristics positively impact product innovation performance in small e-businesses. This research will contribute to developing innovation theory by offering RICH as a solution. The finding that RICH is positively and significantly related to innovation performance is significant for business actors, mainly because it is in the context of developing countries. For entrepreneurs, the findings of this study suggest that developing resources in a manner consistent with the RICH strategy for companies to be more entrepreneurially oriented. In this way, the development and actualization of cognitive resources can reduce uncertainty and lead to resource acquisition and resource protection by entrepreneurs.

Keywords— Digital Eco-Dynamic; RICH; IT Capability; Dynamic Capability; SME; Innovation Performance; e-business.

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I. INTRODUCTION

Innovation is the key to increasing productivity by developing and creating new, higher-value products and services [1]. Innovation produces quality products and has new products that keep up with changes and market tastes that continue to grow. Market uncertainty causes business actors to constantly innovate to win the competition, not only to face market uncertainty and increasing business competition conditions. Therefore, innovation has a significant role in achieving the goals of an SME in maintaining its competitive ability. Small businesses that can innovate will be better able to adapt to environmental changes and create new capabilities to improve their overall performance. Therefore, innovation is essential for company growth and a key determinant in facing business competition [2].

IT capabilities for exploitation, such as those aimed at improving the company's efficiency and productivity, and IT capabilities for exploration, such as those aimed at increasing agility, innovation, and growth, are required. This idea demonstrates that achieving performance requires the company to employ information technology capabilities for exploitation and exploration [3]. As a result, IT ambidexterity refers to a company's exploitation and exploration of its information technology skills [3]. However, permitting IT ambidexterity over service innovation performance depends on the coexistence of specific dynamic capabilities and ambient variables [3]. This dynamic capability is essential for SME services' innovation performance, namely their innovation and network capacities [4], along with environmental uncertainty [5].

Two essential capabilities for SMEs competitiveness in the global economy have been identified in the literature, innovation and networking [6]–[8] and, in particular, innovation performance [9]–[11]. Innovation is seen as a strategic and essential tool that plays a vital role in a company's growth. Therefore, the ability of small businesses to foster creativity and increase innovation in the creative economy, particularly in e-business, is essential to growing and competing.

El Sawy et al. [12] added to the literature on strategic management by highlighting the link between environmental turbulence and dynamic capabilities and supporting IT capability as an essential tertiary factor. El Sawy et al. [12] then refer to this as a digital eco-dynamic occurrence, identified as the complete encounter between the turbulence of the environment, its dynamic function, and the coupled dynamic interactions that reveal IT systems and ecosystems. Yuniarty et al. [13], [14] extend the digital eco-dynamic configuration with Resource-Induced Coping Heuristics. COR's psychological and societal roots underpin the relevance of Resource Induced Coping (Conservation of Resource Theory). When it comes to launching a business, business players are frequently faced with uncertainty, exposing them to resource loss in various instances (e.g., finding consumers or prospects, improving capital, attracting investments, and working with new markets) [15].

The findings of this research help advance innovation theory by enriching knowledge in the management sciences in general, especially in entrepreneurship theory, particularly in innovation IT ambidexterity, dynamic efficiency, opportunity, environmental uncertainty, and resource-induced coping heuristics. Furthermore, this theoretical dimension forms the basis for further research that will bring this study into a broader context related to the effectiveness of entrepreneurial innovation. Therefore, a feasibility test is needed to determine whether IT ambidexterity, dynamic capacity, environmental uncertainty, and resource-induced coping heuristics can ultimately become research models for improving innovation performance.

II. MATERIALS AND METHOD

Wang and Ahmed [16] describe innovation as an organization's overall capability to bring fresh items to the market or market breakthrough by combining strategic direction with innovative behaviors and processes. Product innovation performance is measured as perceived success over the past three years; it has outperformed its competitors [17]: presentation of new goods, new merchandise elements, repositioning of current products, and pioneering discovery of new goods.

The stronger the push for innovation and the more probable innovative businesses will succeed, the more volatile or complicated the environment [18]. Therefore, environmental uncertainty is identified as the environment's level of change and volatility. Environmental uncertainty is measured through research by Syed et al. [19]. The study by Syed et al. [19] refers to previous studies [20], [21]; environmental uncertainty is divided into environmental munificence, environmental dynamism, and environmental complexity.

Co-innovation opportunities and competitiveness become robust against higher levels of environmental uncertainty [22]. The importance of innovation and networking opportunities for SMEs' competitiveness in the global economy has been emphasized in the literature [6]–[8] and, in particular, for innovation performance [9]–[11]. The organizational transformation literature emphasizes using external networks to conduct many transformational activities in companies of all sizes [23]. Some people believe that innovation is a product of the interplay of numerous organizations. Networking is a crucial driver of innovation in these businesses, as SMEs typically face resource constraints [24].

Entrepreneurs in small businesses must use social networks to expand their businesses [25]. An IT resource can be defined as a company's unique IT assets and capabilities [26], [27]. IT assets are generally specific communication and information technology that an organization has access to, while IT functions to represent the capabilities and methods IT provides [28]. The ability to use IT to improve the company's efficiency and productivity (improving functioning efficiency by increasing the effectiveness and duration of the existing operating cycle and lowering costs). IT capabilities enable increased agility, innovation, and growth, such as creating new businesses to develop new techniques for day-to-day work [3].

Previous research has overlooked how people cope with or manage the deficit of resources when faced with uncertainty, which is a study gap [13]. Uncertainty may lead to a unique additional attraction to resources, which a business performer must cope with while evaluating the likely consequences of an uncertain situation. People who are faced with a loss of resources (perceived or actual) are expected to acquire, defend, and develop those resources, according to the Conservation of Resources (COR) theory [29].

According to COR theory, people who have lost (potential or actual) resources are expected to acquire, defend, and develop resources [29]. In the process, resource stocks, such as some of the effects, may be created to mitigate the negative impact of resource loss. These consequences can be clarified further to address future and actual resource loss. The COR theory's process of obtaining, safeguarding, and developing resources provides an overall security impact in the situation of potential resource loss. The existence of resources that might replace the lost resources contributes to a sense of wellbeing [29]. The behavioral impact of COR on actual resource loss is more clearly described as the pressure of resource loss decreases or decreases when the lost resource is replaced by acquired, protected, and developed resources [30].

COR's psychological and societal roots underpin the relevance of Resource Induced Coping. COR theory behaviors are implemented using the Resource-Induced Coping Heuristic (RICH) (i.e., resource achievement, defense, and advancement) [15]. Thus, Resource Induced Coping Heuristic (RICH) is defined as the act of acquiring, protecting, and exploiting resources, which are fundamental elements of the theory of behavior [29], [31]. Based on the literature study, the conceptual model is pictured in Fig. 1.



Fig. 1 Conceptual Framework

This research applied quantitative approaches to examine the factors defining innovation performance among SMEs. A 29-item questionnaire with eight factors was created and delivered using a Microsoft Form URL link from June 2021 until August 2021. Furthermore, the simple random sampling method obtained 300 responses from e-business SMEs in Indonesia who also sell their products on e-commerce platforms (of the target of 385 calculated by the Lemeshow formula and a margin of error of 5%). A research framework consisting of 44 measurement scales. Each factor consisted of four questions. For analysis, all questionnaire items were graded on a 7-point Likert scale, with 1 indicating severe disagreement and 7 indicating strong agreement. This research calculates descriptive analyses and examines normalcy distributions. By looking at the mean value of the items, descriptive analysis was used to determine replies to all questionnaire statements.

On the other hand, the normality test evaluates data distribution in collecting data or variables. If the skewness ratio and kurtosis are ± 2 , the data distribution is normally distributed [32]. With symmetrical distribution centered on the average value of all data in a population, biased or unbalanced judgments can be avoided. In addition, the Lisrel 8.7 was utilized to corroborate the factor analysis test in this study.

The first step in the questionnaire item validation procedure starts from the pre-test and linguist review. Then the empirical data collected was calculated using Confirmatory Factor Analysis (CFA) and Construct Reliability (CR) analysis as a condition for construct validity and internal consistency.

CFA is a statistical tool helpful in finding the form of the construct of a set of manifest variables or testing a variable on the manifest assumptions that build it. Therefore, confirmatory analysis is suitable for testing a theory of variables on the manifest or the indicators that build it. The variables are assumed only to be measured by these indicators [33]. The CFA results reveal that the various questions in the questionnaire assess the construct that the underlying theoretical framework hypothesized. As a result, based on the stated theoretical framework, the CFA generates empirical proof of the instrument's validity ratings. Construct reliability measures the internal consistency of a variable's indicators that show the degree to which the variables are formed. The limit value of the construct reliability test is accepted if the value is > 0.70 [33].

In the Structural Equation Modeling (SEM) framework, both variance and covariance-based, a questionnaire is valid if the loading factor value is 0.5 for analysis of covariance and 0.7 for analysis of variance [34]. Furthermore, the average variance extracted (AVE) value is greater than 0.5. Several goodness indices were derived in CFA to examine the model fit of the model framework under study, including Chi-square (X^2) and Root Mean Square Error of Approximation (RSMEA) [35].

As absolute fit indices, Chi-square and RMSEA statistics can help determine the quality of the theoretical model. The X^2 shows the discrepancy between the actual and anticipated covariance matrices. The lesser the X^2 value indicates a better fit model [36]. The X^2 test should be insignificant for models with a satisfactory fit. The sample size has a big impact on the statistical significance of the X^2 test results. The RMSEA measures the difference between the theoretical model and the population covariance matrix. The RMSEA score of less than 0.08 indicates a better model and limits the allowed model fit [37]. This study's alpha (α) level was set at 0.05 for the goodness-of-fit chi-square test (X^2).

III. RESULTS AND DISCUSSION

The mean and standard deviation are shown in Table 1 as descriptive statistics. The value of skewness and kurtosis is ± 2 , showing that the data is normally distributed [32]. Descriptive statistics reveal information about the data. Descriptive statistics are essential because the quality of the data collected will impact the overall data analysis.

MEASURES, DESCRIPTIVE STATISTICS, AND NORMALITY TEST										
Indicator	Mean	Standard Deviation	Excess Kurtosis	Skewness	Confirmatory Factor Analysis & Internal Consistency					
					Λ	Λ^2	Е	CR	VE	
Product Innovation Performance										
IPF1. New products introduced.	5.469	0.995	-0.492	-0.396	0,82	0,67	0,32			
IPF2. New product features.	5.477	1.033	-0.309	-0.340	0,81	0,66	0,34	0.80	0,68	
IPF3. Reposition existing products.	5.469	0.927	-0.090	-0.341	0,76	0,58	0,42	0,89		
IPF4. Pioneers of new product breakthroughs.	5.534	0.984	-0.151	-0.647	0,89	0,79	0,20			
Environmental Uncertainty										
EVD1. Product changes.	5.542	0.944	-0.605	-0.278	0,82	0,67	0,33		0,63	
EVD2. Technology changes.	5.548	0.981	-0.092	-0.317	0,73	0,53	0,47	0.87		
EVD3. Changes to competitors' actions.	5.425	0.945	-0.429	-0.279	0,79	0,62	0,38	0,87		
EVD4. Changes in product demand.	5.501	0.942	-0.555	-0.328	0,82	0,67	0,32			
EVC1. Diversity of customer buying habits.	5.564	1.093	-0.872	-0.303	0,84	0,71	0,29			
EVC2. Product line diversity.	5.534	1.046	-0.728	-0.127	0,80	0,64	0,36	0 00	0.66	
EVC3. Supplier change.	5.545	1.051	-0.855	-0.126	0,76	0,58	0,43	0,88	0,00	
EVC4. Changes in legal regulations.	5.490	1.080	-0.793	-0.301	0,84	0,71	0,30			
EVM1. Profit opportunities.	5.629	1.109	-1.092	-0.275	0,79	0,62	0,37		0,67	
EVM2. Sufficient capital stock.	5.635	1.027	-1.033	-0.086	0,81	0,66	0,34	0.80		
EVM3. Can access resources.	5.605	1.054	-0.928	-0.250	0,82	0,67	0,33	0,89		
EVM4. External threats.	5.480	1.014	-0.514	-0.471	0,86	0,74	0,26			
IT Ambidexterity										
ITE1. It to apply innovation widely.	5.501	1.127	-0.391	-0.514	0,85	0,72	0,42		0,62	
ITE2. It to implement operational innovation.	5.512	1.109	-0.496	-0.332	0,85	0,72	0,51	0.97		
ITE3. It to introduce new products.	5.463	1.099	-0.585	-0.265	0,89	0,79	0,36	0,87		
ITE4. It to get new customers.	5.556	1.130	-0.478	-0.543	0,85	0,72	0,49			

TABLE I

Indicator	Mean	Standard Deviation	Excess Kurtosis	Skewness	Confirmatory Factor Analysis &					
					Internal Consistency					
		Deviation	itui tosis		Λ	Λ^2	Е	CR	VE	
ITT1. It can reduce costs.	5.253	1.041	-1.057	0.046	0,83	0,69	0,38			
ITT2. It to reduce the time it takes for business operations	5 360	0.986	-0.760	0.086	0.80	0.64	0.37			
to cycle.	5.500	0.900	0.700	0.000	0,00	0,04	0,57	0.89	0.67	
ITT3. Business operations are more efficient as a result of	5 1 8 8	0 000	-0.823	0.044	0.85	0.72	0.30	0,09	0,07	
it.	5.100	0.777	-0.025	0.044	0,05	0,72	0,50			
ITT4. It to serve customer segments.	5.210	1.029	-0.844	-0.098	0,83	0,69	0,31			
Dynamic Capability										
IPB1. Knowledge from different resources.	5.529	1.056	-0.858	-0.333	0,94	0,88	0,31			
IPB2. Support workers to participate.	5.657	1.058	-0.738	-0.319	0,86	0,74	0,38	0.02	0,73	
IPB3. Evaluate new ideas.	5.493	1.041	-0.783	-0.236	0,93	0,86	0,30	0,92		
IPB4. Adapt to environmental changes.	5.583	1.101	-0.707	-0.470	1,00	1,00	0,28			
NPB1. The right network partners.	5.240	1.081	-1.037	0.031	0,94	0,88	0,35			
NPB2. Integrate network partner activities.	5.398	1.001	-0.718	-0.191	0,77	0,59	0,46	0.80	0,67	
NPB3. Find a partner to rely on.	5.264	0.998	-0.763	-0.186	0,89	0,79	0,27	0,89		
NPB4. Use connections to make things happen.	5.313	1.027	-0.932	-0.127	0,84	0,71	0,37			
RICH										
ARC1. Make something valuable your own.	5.559	1.016	-0.591	-0.379	0,83	0,69	0,39		0,69	
ARC2. Get resources.	5.632	1.126	-0.310	-0.550	0,95	0,90	0,35	0.00		
ARC3. Pursuing valuable things without much thought.	5.529	1.092	-0.317	-0.496	0,90	0,81	0,31	0,90		
ARC4. Get something instinctively.	5.480	1.033	-0.608	-0.481	0,86	0,74	0,33			
PRC1. Protect your belongings.	5.695	1.176	-0.757	-0.599	1,05	1,10	0,33			
PRC2. Take care of the things you own.	5.883	1.077	-0.311	-0.710	0,97	0,94	0,34	0,92	0,75	
PRC3. Protect the things you have against loss.	5.790	1.008	-0.568	-0.483	0,94	0,88	0,30			
PRC4. Instinctively protect our belongings.	5.714	1.024	-0.171	-0.611	0,96	0,92	0,34			
DRC1. Find novel ways to use resources.	5.531	0.973	-0.573	-0.338	0,70	0,49	0,40			
DRC2. Rise the value of the goods owned.	5.559	1.103	-0.276	-0.565	0,88	0,77	0,34	0.07	0,62	
DRC3. Make something more substantial.	5.507	1.009	-0.049	-0.538	0,79	0,62	0,35	0,8/		
DRC4. Advance new resources from old resources.	5.518	0.973	0.022	-0.638	0,76	0,58	0,41			

Notes: IPF - Product Innovation Performance; EVD - Environmental Dynamism; EVC - Environmental Complexity; EVM - Environmental Munificence; ITE - IT Capability for Exploration, ITT - IT Capability for Exploitation; IPB - Innovation Capability; NPB - Network Capability; ACR - Acquiring Resources; PRC - Protecting Resources; DRC - Developing Resources

The overall results of the validity and reliability tests are presented in Table 1, which are Confirmatory Factor Analysis (CFA), Average Variance Extracted (AVE), and Construct Reliability (CR) analyzed. The construct concept can be unidimensional or multidimensional, impacting its validity and reliability, and the construct is in unidimensional validity and reliability testing using First Order Confirmatory Factor Analysis (CFA First Order). This study's constructs of course quality, student factor, e-learning tech, overall quality, and student engagement are multidimensional, so they must be measured using a second-order procedure. While the constructs of institutional factors, instructor characteristics, satisfaction, and performance impact are unidimensional, they must be measured using a first-order process.

Reliability testing for all constructs in the theoretical model in first-order resulted in a CR value of more than 0.7. Every dimension and indicator of each measured construct can reflect the primary construct well. In other words, the questionnaire used has a high level of consistency. Likewise, for validity testing, all indicators and dimensions of the primary constructs produce standardized loading factors and AVE values of more than 0.5. Again, each dimension and indicator can reflect its primary construct.

In conclusion, the questionnaire used in this study resulted in high validity and reliability. The correlations between the various components reveal that they are all strongly associated. Furthermore, the standard loading factor coefficient between the tested factors and items shows that no loading factor value is lower than the bad loading factor limit.

Figure 2 also shows the loading factors, which have met the conditions above 0.5 to meet the validity test. All the

factors' RMSEA value smaller than 0.08 indicates a better model and limits acceptable model fit.

IT capability, dynamic capability, RICH, and environmental uncertainty increase innovation performance. The effect is indicated by the adjusted R Square of 57.7 percent (alpha 5 percent), with a sig ANOVA value of 0.000 and a Standard Error of the Estimate of 2.31. The total effect is significant enough to explain the innovation performance as the exogenous variable above 0.5. RMSEA value smaller than 0.08 indicates a better model, and the model fit is acceptable [37]. After fulfilling the validity, reliability, and model fit tests, the instrument can further test the research hypothesis.

The findings of this research are given as a novel model that can provide insights and recommendations for improving innovation efficiency in the Indonesian food industry through IT capability, dynamic, and resource-driven heuristic (RICH) behavior in the context of environmental uncertainty. The suggestions and materials are also valuable for local and central governments regulatory bodies working to improve the effectiveness of innovations that encourage e-business SMEs to compete or compete amid the COVID-19 pandemic that has hit Indonesia. In a downturn, the determination and constancy of SME players to continue driving the economy might be the key to economic recovery. The constancy and coordination of SMEs, the government, major corporations, and society must continue to build optimism for Indonesia's economic recovery. Collaboration is critical to the growth of local MSMEs and their ability to compete, and the participation of stakeholders might push corporate players to be more resilient. Vital national SMEs can benefit from synergistic collaboration across players in the global market.



Chi-Square=32.90, df=19, P-value=0.02469, RMSEA=0.049 Chi-Square=24.22, df=19, P-value=0.18801, RMSEA=0.030



Chi-Square=1.74, df=1, P-value=0.18666, RMSEA=0.050



Fig. 2 Confirmatory Factor Analysis

Moreover, managers can avoid constructing opportunities associated with the lack of high-performing innovation in ebusiness. For example, administrators must ensure that robust IT discovery and substantial IT leverage are not lacking in defined and uncertain environments, preventing highperformance, innovative services from being achieved. In general, managers can explore the various components of a company's digital ecological dynamics to improve product innovation performance by top-level configurations that are compatible with the company's strategic stance and avoid inefficient arrangements. Managers must encourage IT capability as organizational culture [38]. The complete system's resources and competencies are necessary for the digital business strategy to be implemented successfully [39].

This study is interested in solving the problem of innovation performance in e-business in Indonesia and is expected to provide added value and benefits. The main issues identified in this study are environmental uncertainty, low information technology capabilities, and low dynamic capabilities, which contribute to the low efficiency of innovation.

When SMEs use networking and innovation capabilities to generate new product ideas, a set of subroutines that they use to consume IT capabilities transforms these ideas into new service offers. Through its IT infrastructure and e-business capabilities, IT also facilitates the distribution of new or changed goods. To be highly productive in product innovation, SMEs must have critical networking and innovation capabilities and strong IT capabilities that can be used in a high uncertainty environment.

Applying the RICH construct to research Innovation Performance is a novelty in this research. However, previous research has empirically tested the significance of the effect of RICH on entrepreneurial orientation in small businesses in Ghana [40], the financial performance of entrepreneurial ventures, perceptions of entrepreneurial success of business students and individual workers [15], job satisfaction, economic well-being [41], and RICH's function in moderating job security and entrepreneurial work happiness, as well as job security and financial well-being, and between autonomy and economic well-being [41].

IV. CONCLUSION

The reliability and validity of parameters and factors in the research design may be assessed using confirmatory factor analysis (CFA). CFA provides additional justification for the constituent parameters, and lean tools inherently investigate [33]. Therefore, our study used a constructivist approach to characterize the digital ecological dynamics of SMEs in industrial services and to find groups of comparable causal factors that contribute to the presence or absence of high of e-business innovation. Environmental levels unpredictability, dynamic capacities of chosen organizations, and, most crucially, the duality of IT in the form of IT capabilities for research and operations in information security research are the cause circumstances. In this approach, we intend to learn more about the breadth and techniques that SMEs might use to create and deploy IT resources and skills to support service innovation and management.

Based on the identified issues, the behavior of IT Ambidexterity, Dynamic Capabilities, and Resource-Dependent Copy Heuristic (RICH) in an uncertain environment are factors determining innovation performance. An assessment and monitoring plan is the final step in troubleshooting, aiming to evaluate and implement a problem's recommended solution. It is the following correct action to take when looking at the results of a measurable metric as a verification tool. The proposed solutions are expected to be suitable for implementation and solve SMEs' problems in Indonesian e-business.

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REFERENCES

- K. N. Dervitsiotis, "Developing full-spectrum innovation capability for survival and success in the global economy," *Total Qual. Manag. Bus. Excell.*, vol. 21, no. 2, pp. 159–170, 2010, doi: 10.1080/14783360903549865.
- [2] H. Salavou, G. Baltas, and S. Lioukas, "Organisational innovation in SMEs," *Eur. J. Mark.*, vol. 38, no. 9/10, pp. 1091–1112, 2004, doi: 10.1108/03090560410548889.
- [3] O. K. Lee, V. Sambamurthy, K. H. Lim, and K. K. Wei, "How Does IT Ambidexterity Impact Organizational Agility?," *Inf. Syst. Res.*, vol. 26, no. 2, pp. 398–417, Jun. 2015, doi: 10.1287/isre.2015.0577.
- [4] G. Zaefarian, S. Forkmann, M. Mitręga, and S. C. Henneberg, "A Capability Perspective on Relationship Ending and Its Impact on Product Innovation Success and Firm Performance," *Long Range Plann.*, vol. 50, no. 2, pp. 184–199, 2017, doi: https://doi.org/10.1016/j.lrp.2015.12.023.
- [5] D. Prajogo and C. M. Mcdermott, "Antecedents of Service Innovation in SMEs: Comparing the Effects of External and Internal Factors," *J. Small Bus. Manag.*, vol. 52, no. 3, pp. 521–540, 2014, doi: 10.1111/jsbm.12047.
- [6] F. C. I., F. J. J., V. P. M., and M. Carla, "The effects of coopetition on the innovation activities and firm performance: Some empirical evidence," *Compet. Rev. An Int. Bus. J.*, vol. 29, no. 5, pp. 622–645, Jan. 2019, doi: 10.1108/CR-12-2018-0080.
- [7] M. Saunila, "Innovation capability for SME success: perspectives of financial and operational performance," J. Adv. Manag. Res., vol. 11, no. 2, pp. 163–175, Jul. 2014, doi: 10.1108/JAMR-11-2013-0063.
- [8] M. Spriggs, A. Yu, D. Deeds, and R. L. Sorenson, "Too Many Cooks in the Kitchen: Innovative Capacity, Collaborative Network Orientation, and Performance in Small Family Businesses," *Fam. Bus. Rev.*, vol. 26, no. 1, pp. 32–50, 2013, doi: 10.1177/0894486512468600.
- [9] M.-L. Verreynne, A. M. Williams, B. W. Ritchie, S. Gronum, and K. S. Betts, "Innovation diversity and uncertainty in small and medium sized tourism firms," *Tour. Manag.*, vol. 72, pp. 257–269, 2019, doi: https://doi.org/10.1016/j.tourman.2018.11.019.
- [10] D. I. Prajogo and P. K. Ahmed, "Relationships between innovation stimulus, innovation capacity, and innovation performance," *R D Manag.*, vol. 36, no. 5, pp. 499–515, 2006, doi: 10.1111/j.1467-9310.2006.00450.x.
- [11] S. X. Zeng, X. M. Xie, and C. M. Tam, "Relationship between cooperation networks and innovation performance of SMEs," *Technovation*, vol. 30, no. 3, pp. 181–194, 2010, doi: 10.1016/j.technovation.2009.08.003.
- [12] O. A. El Sawy, A. Malhotra, Y. K. Park, and P. A. Pavlou, "Seeking the configurations of digital ecodynamics: It takes three to tango," *Inf. Syst. Res.*, vol. 21, no. 4, pp. 835–848, 2010, doi: 10.1287/isre.1100.0326.
- [13] Yuniarty, I. Gautama So, S. B. Abdinagoro, and M. Hamsal, "Completing the Configuration of Digital Eco-Dynamic to Improve the Innovation Performance of SMEs," in 2021 6th International Conference on Business and Industrial Research (ICBIR), May 2021, pp. 179–183, doi: 10.1109/ICBIR52339.2021.9465841.
- [14] Yuniarty, I. G. So, S. B. Abdinagoro, and M. Hamsal, "Sustaining the Innovation Performance of E-Business SMEs Through Digital Eco-Dynamic to Survive in the Covid-19 Pandemic," in 2021 International Conference on Information Management and Technology (ICIMTech), Aug. 2021, pp. 761–766, doi: 10.1109/ICIMTech53080.2021.9534922.
- [15] S. E. Lanivich, "The RICH Entrepreneur: Using Conservation of Resources Theory in Contexts of Uncertainty," *Entrep. Theory Pract.*, vol. 39, no. 4, pp. 863–894, 2015, doi: 10.1111/etap.12082.
- [16] C. L. Wang and P. K. Ahmed, "The development and validation of the organisational innovativeness construct using confirmatory factor analysis," *Eur. J. Innov. Manag.*, vol. 7, no. 4, pp. 303–313, 2004, doi: 10.1108/14601060410565056.

- [17] H. Aksoy, "How do innovation culture, marketing innovation and product innovation affect the market performance of small and medium-sized enterprises (SMEs)?," *Technol. Soc.*, vol. 51, pp. 133– 141, 2017, doi: 10.1016/j.techsoc.2017.08.005.
- [18] M. S. Freel, "Perceived Environmental Uncertainty and Innovation in Small Firms," Small Bus. Econ., vol. 25, no. 1, pp. 49–64, 2005, doi: 10.1007/s11187-005-4257-9.
- [19] T. A. Syed, C. Blome, and T. Papadopoulos, "Impact of IT Ambidexterity on New Product Development Speed: Theory and Empirical Evidence," *Decis. Sci.*, vol. 51, no. 3, pp. 655–690, 2020, doi: 10.1111/deci.12399.
- [20] H. E. Aldrich, "Organizations and environments, Prentice Hall," Inc., Englewood Cliffs, NJ, 1979.
- [21] G. G. Dess and D. W. Beard, "Dimensions of Organizational Task Environments," *Adm. Sci. Q.*, vol. 29, no. 1, p. 52, Mar. 1984, doi: 10.2307/2393080.
- [22] F. Wang, J. Zhao, M. Chi, and Y. Li, "Collaborative innovation capability in IT-enabled inter-firm collaboration," *Ind. Manag. Data Syst.*, vol. 117, no. 10, pp. 2364–2380, Dec. 2017, doi: 10.1108/IMDS-09-2016-0392.
- [23] H. John, "Inter-firm R&D partnerships: an overview of major trends and patterns since 1960," *Res. Policy*, vol. 31, no. 4, pp. 477– 492, 2002.
- [24] J. R. Diez, "Metropolitan Innovation Systems: A Comparison between Barcelona, Stockholm, and Vienna," *Int. Reg. Sci. Rev.*, vol. 25, no. 1, pp. 63–85, Jan. 2002, doi: 10.1177/016001702762039385.
- [25] S. S. Omar, M. Higgs, C. S. Wei, and M. Ali, "Network ties' governance in entrepreneurial networking of SMEs: Cases of the ownermanagers in the southern region of Malaysia," *Asian Acad. Manag. J.*, vol. 25, no. 1, pp. 85–101, 2020, doi: 10.21315/AAMJ2020.25.1.5.
- [26] G. Piccoli and B. Ives, "Sustaining competitive advantage-itdependent strategic initiatives and sustained competitive advantage: A review and synthesis of the literature," *Strateg. Inf. Manag. Challenges Strateg. Manag. Inf. Syst.*, vol. 29, no. 4, pp. 34–68, 2014, doi: 10.4324/9781315880884-10.
- [27] M. Wade and J. Hulland, "The resource-based view and information systems research: Review, extension, and suggestions for future research," *MIS Q.*, vol. 28, no. 1, pp. 107–142, 2004.
- [28] S. Aral and P. Weill, "IT assets, organizational capabilities, and firm performance: How resource allocations and organizational differences

explain performance variation," Organ. Sci., vol. 18, no. 5, pp. 763–780, 2007, doi: 10.1287/orsc.1070.0306.

- [29] S. E. Hobfoll, "The influence of culture, community, and the nestedself in the stress process: Advancing conservation of resources theory," *Appl. Psychol.*, vol. 50, no. 3, pp. 337–421, 2001, doi: 10.1111/1464-0597.00062.
- [30] S. E. Hobfoll, "Conservation of resource caravans and engaged settings," J. Occup. Organ. Psychol., vol. 84, no. 1, pp. 116–122, 2011, doi: 10.1111/j.2044-8325.2010.02016.x.
- [31] S. E. Hobfoll, "Conservation of resources: a new attempt at conceptualizing stress.," *Am. Psychol.*, vol. 44, no. 3, p. 513, 1989.
- [32] N. K. Malhotra, D. Nunan, and D. F. Birks, *Marketing Research: An Applied Approach*. 2017.
- [33] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, "Multivariate Data Analysis," *Hampshire, United Kingdom*, 2019.
- [34] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," *Eur. Bus. Rev.*, vol. 31, no. 1, pp. 2–24, Jan. 2019, doi: 10.1108/EBR-11-2018-0203.
- [35] R. B. Kline, Principles and practice of structural equation modeling. Guilford publications, 2015.
- [36] H. Gatignon, "Confirmatory factor analysis," in *Statistical analysis of management data*, Springer, 2014, pp. 77–154.
- [37] S. G. West, A. B. Taylor, and W. Wu, "Model fit and model selection in structural equation modeling," *Handb. Struct. Equ. model.*, vol. 1, pp. 209–231, 2012.
- [38] S. H. Chuang and H. N. Lin, "Co-creating e-service innovations: Theory, practice, and impact on firm performance," *Int. J. Inf. Manage.*, vol. 35, no. 3, pp. 277–291, 2015, doi: 10.1016/j.ijinfomgt.2015.01.002.
- [39] J. Karimi and Z. Walter, "Corporate Entrepreneurship, Disruptive Business Model Innovation Adoption, and Its Performance: The Case of the Newspaper Industry," *Long Range Plann.*, vol. 49, no. 3, pp. 342–360, Jun. 2016, doi: 10.1016/j.lrp.2015.09.004.
- [40] S. Adomako, "Resource-induced coping heuristics and entrepreneurial orientation in dynamic environments," *J. Bus. Res.*, vol. 122, no. September, pp. 477–487, 2021, doi: 10.1016/j.jbusres.2020.09.026.
- [41] S. E. Lanivich, A. Bennett, S. R. Kessler, N. McIntyre, and A. W. Smith, "Rich with well-being: An entrepreneurial mindset for thriving in early-stage entrepreneurship," *J. Bus. Res.*, no. June, 2020, doi: 10.1016/j.jbusres.2020.10.036.