






“Crowdsourcing capabilities: fueling new products? How firm size and business type matter”

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CROWDSOURCING CAPABILITIES: FUELING NEW PRODUCTS? HOW FIRM SIZE AND BUSINESS TYPE MATTER

Abstract

Crowdsourcing has emerged as a valuable tool for organizations seeking to access external knowledge and resources for their innovation processes. This study aims to investigate crowdsourcing capabilities in the context of new product development initiatives, with a focus on exploring the moderating effects of firm size and type. Structural Equation Modeling using Partial Least Squares (SEM-PLS) is used to analyze both the measurement and structural models, with data drawn from 217 owners and managers of diverse businesses in Indonesia. These businesses range from small to medium-scale enterprises across various types, including cafes, restaurants, fashion, culinary, and furniture. The findings reveal a positive and significant impact of crowdsourcing capabilities on new product development initiatives ($\beta = 0.746$, $p = 0.000$). Moreover, the relationship between crowdsourcing and new product development is moderated by firm size (whether small or medium) ($\beta = 0.103$, $p = 0.045$) and the type of business ($\beta = 0.157$, $p = 0.012$). The outcomes of this study are anticipated to enrich the body of knowledge and provide valuable guidance for enterprises seeking to harness crowdsourcing in their new product development processes, with specific factors like firm size and type taken into account.

Keywords

crowdsourcing, crowdsolver, new product development, small- and medium-scale enterprises, firm size, business type

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INTRODUCTION

Crowdsourcing provides significant advantages to SMEs, offering access to an extensive pool of external knowledge and expertise, which fosters innovation and improved decision-making within the organization. This diversity of ideas enhances the potential for innovation.

Moreover, crowdsourcing enables SMEs to expand their operations beyond their limited resources by tapping into a larger workforce and expertise, enhancing their capacity to undertake more projects and refine design and manufacturing processes.

Additionally, crowdsourcing fosters closer relationships between SMEs and their customers and stakeholders. Through crowdsourcing platforms, firms can engage customers in the product creation or innovation process, meeting expectations, fostering innovation, and enhancing satisfaction. This continual involvement strengthens the relationship between firms and customers, leading to increased loyalty intentions.

However, it is crucial to recognize that crowdsourcing poses challenges for SMEs, such as a lack of awareness about suitable tools and platforms for their businesses and tasks. Many SMEs are unfamiliar with

the platforms where crowdsourcing challenges are advertised, limiting their ability to fully leverage crowdsourcing as a problem-solving tool.

SMEs may have a limited understanding of how to effectively adopt crowdsourcing in their innovation practices. This lack of awareness and understanding can impede firms from fully harnessing crowds' creativity to transform innovative ideas into actionable plans and tools.

While crowdsourcing offers valuable advantages, addressing challenges related to knowledge gaps and implementation is crucial for SMEs. Hence, the research focuses on understanding how crowdsourcing capabilities contribute to the advancement of new product development within the context of SMEs.

1. LITERATURE REVIEW AND HYPOTHESES

Crowdsourcing equips SMEs with crucial insights into customer preferences and behaviors (Devece et al., 2019). It cultivates open innovation, bolstering SMEs' competitiveness and innovativeness (Martinez-Corral et al., 2019). SMEs harness crowdsourcing to expand operations, refine product development, and boost overall business performance (Qin et al., 2016). Crowdsourcing resources find utility across various stages of the product lifecycle, from design to distribution (Castillo et al., 2017). Social media platforms, renowned for their user-friendliness, cost-effectiveness, and expansive reach, have become indispensable tools for SMEs (Li et al., 2021). These platforms facilitate engagement with customers, feedback collection, and participation in decision-making processes (Cheng & Shiu, 2018).

Crowdsourcing platforms elevate SMEs' business performance by fostering connections between suppliers and customers, providing access to the collective wisdom of the crowd (Mansor et al., 2022). SMEs can amplify design and manufacturing operations, enhancing overall performance and quality (Qin et al., 2016). In marketing, prior studies highlight that labeling crowdsourced products can enhance market performance by up to 20% (Nishikawa et al., 2017). Crowdsourcing is applied to low-involvement products like fast food, beverages, and snacks (Pacauskas et al., 2018). Firms use crowdsourcing across various functions, encompassing product development, advertising, promotion, and marketing research (Whitla, 2009). Crowdsourced customer participation complements traditional methods, yielding valuable market insights (Gruner & Power, 2017).

In new product development, crowdsourcing spans diverse stages, involving idea generation by soliciting innovative design ideas from consumers (Li et al., 2018). Crowdsourcing extends to problem-solving, collaborative work, design, testing, and prototyping (Qin et al., 2016). Additionally, it provides expert support, granting access to specialized knowledge and skills not available internally (Qin et al., 2016). By leveraging networks, organizations tap into diverse expertise and perspectives, fostering more innovative solutions (Köhler & Chesbrough, 2019).

Crowdsourcing in new product development entails leveraging the collective intelligence and creativity of a crowd to generate innovative ideas and solutions (Zahay et al., 2018). Facilitated through online platforms, this approach enables organizations to tap into diverse perspectives, enhance technological capabilities, and foster the creation of novel products (Poetz & Schreier, 2012). Particularly beneficial in the early stages of product development, crowdsourcing aids idea generation and concept development by accessing a wide range of external insights (Lin et al., 2022). Despite its potential, crowdsourcing in new product development is still evolving, and ongoing research aims to determine its efficacy and best practices (Zahay et al., 2018).

The process unfolds in stages, starting with firms using crowdsourcing to collect product ideas from the crowd via online platforms where participants submit descriptions or concept drawings (Nishikawa et al., 2017). Selected ideas undergo development into marketable products. Subsequently, organizations evaluate the fit of developed products within their portfolio, determining if they are new-to-the-world or product line extensions, aim-

ing for a competitive advantage or market position maintenance (Zahay et al., 2018). Thirdly, crowdsourcing integrates into research and development projects, involving the crowd throughout the development journey (Wang & Yu, 2020).

Crowdsourcing can be advantageous for smaller firms in the domain of new product development, considering their inherent constraints in terms of internal resources and expertise. They can involve external crowdsourcing communities to acquire creative ideas and solutions (Zhu et al., 2017), thereby overcoming resource constraints and accessing a broader spectrum of innovative ideas (Yang & Han, 2021). Furthermore, smaller firms have a more flexible organizational structure, which enables them to swiftly adapt and integrate external inputs into their product development process (Pollok et al., 2019). Larger firms may face challenges in effectively managing crowdsourcing activities as a result of their considerable size and organizational complexity. This is due to they may have already established internal processes that could potentially impede the smooth integration of external inputs (Pollok et al., 2019). Additionally, larger firms may have access to more extensive internal resources and expertise, which can minimize their reliance on external crowdsourcing (Yang & Han, 2021). Therefore, it is assumed that the size of the firm serves as a moderating factor in the correlation between crowdsourcing capabilities and the development of new products.

Similarly, crowdsourcing has been found to be a valuable tool in various industries, including the fashion industry, retail, and food delivery. In the fashion industry, it can enhance product design using external talents and address the shortage of designers (Li et al., 2018). However, luxury brands may not actively promote the outcome as “customer-ideated” due to the strong reputation of their in-house designers (Nishikawa et al., 2017). In the retail sector, crowdsourcing can be used for pre-sale methods, generating funds and assessing customer interest before product launch (Konhäusner, 2021). This helps retailers validate demand and mitigates the risk of investing in products that may not resonate with consumers. Crowdsourcing also aids in price determination, allowing retailers to gather customer input to establish the optimal pricing strategy (Konhäusner, 2021). The unique

characteristics and requirements of various business types significantly influence how SMEs harness their capabilities to drive innovation and develop new products.

This study aims to analyze the interplay between crowdsourcing capabilities, firm characteristics, and new product development.

The following hypotheses are proposed:

- H1: *There exists a correlation between the capabilities of crowdsourcing and the development of new products.*
- H2: *The correlation between crowdsourcing capability and new product development is moderated by firm size.*
- H3: *The correlation between crowdsourcing capability and new product development is moderated by the type of business.*

2. METHOD

The research utilized a quantitative approach, using a cross-sectional survey methodology to collect data from SME managers and owners in Indonesia. The initial list of SMEs was obtained from the central government institution overseeing SME development. A random sampling approach was utilized to mitigate bias and enhance the applicability of the findings to the broader target population.

A structured questionnaire was self-administered to a randomly selected group of participating SMEs. The questionnaire featured two distinct sections: the first section focused on the demographic characteristics of the sample, while the second section assessed critical research constructs. A rigorous translation and retranslation process was conducted to guarantee the suitability of the questionnaire for Indonesian participants. Respondents were required to provide ratings using a five-point Likert scale.

To ensure the robustness of the research tool, the study integrated validated scales from reputable research studies to create a questionnaire tailored specifically for SMEs. In assessing the crowdsourcing capability of SMEs, the research utilized a measure-

ment scale comprising eleven items, sourced from prior studies conducted by Afuah and Tucci (2012) and Salisu and Bakar (2019). Additionally, the evaluation of the scope of new product development relied on four items, as specified in the studies of Ma et al. (2012) and Chaochotechuang and Mariano (2016).

The current study further explores how firm size might moderate the capabilities of SMEs in crowdsourcing and new product development. This observation highlights the tendency for larger firms to possess more extensive resources and capabilities, providing them with opportunities for product development and innovation. Conversely, smaller enterprises may encounter limitations in this regard. Additionally, the study delves into the moderating effect of various business types, recognizing that they may face unique challenges when adopting crowdsourcing as a strategy to drive innovation in new product development.

Furthermore, the study utilized the Full Collinearity VIF method, as introduced by Kock and Lynn (2012), to identify potential common method bias that could have influenced the PLS-SEM analysis (Kock, 2015). The results consistently revealed VIF values below the threshold of 3.3, signifying the absence of any significant common method bias. The full collinearity VIF values for all variables ranged from 1.785 to 2.706, confirming the reliability and validity of the study's findings.

For rigorous data analysis, the study used the Partial Least Squares (PLS) Structural Equation Model (SEM) to investigate relationships among latent variables. The decision to use PLS was based on its efficacy in addressing concerns related to normality and sample size. The statistical significance of coefficients was evaluated using Smart PLS, a software tool that utilizes nonparametric bootstrapping methods. A significance level of 0.05 was selected to minimize the risk of errors in detecting effects.

The study involved a cohort of 217 individuals, serving as business owners and managers, constituting the sample characteristics. Notably, the gender distribution within this group is evenly balanced. The study encompasses a cohort of 99 female participants, representing 45.62% of the

total sample. Furthermore, the sample consists of 118 male participants, accounting for 54.37% of the total. A predominant portion of participants, approximately 26.27% of the total sample, actively engage in the operations of cafes and restaurants. The analysis subsequently focuses on fashion enterprises, comprising 21.66% of the participants. Culinary enterprises represent 23.96% of the respondents, while furniture enterprises account for 19.35%. The remaining 8.76% of respondents are derived from various sectors.

The sample's educational backgrounds exhibit a wide range, with a substantial percentage of individuals holding a Bachelor's degree (33.18%). Those with a high school diploma or equivalent constitute 37.79% of the total sample. Postgraduate students make up 11.98% of the overall sample, whereas individuals with diplomas account for 17.05%.

Business revenue ranges from IDR 501 million to IDR 1.5 billion, with smaller segments falling within the IDR 1.51 billion – IDR 2.5 billion range, representing 18.89% of the total revenue.

The primary reasons for utilizing social media platforms are to boost product and service visibility and market presence (28.57%) and streamline the process of generating product sales (33.64%). Additionally, social media serves as a platform for collecting valuable feedback from customers (14.29%), aiding in the growth of one's customer base (13.36%), and promoting the exploration of ideas and innovative concepts to enhance the development of new products (10.14%).

Respondents predominantly depend on internal sources within their respective organizations, although external sources also play a significant role, accounting for 21.66% of the total respondents. A significant proportion, specifically 34.56%, utilizes a combination of both internal and external sources.

3. RESULTS

The initial analysis aimed to assess the reliability of all study constructs, including the evaluation of the reliability of the items, composite reliability (CR), and average variance explained (AVE).

Table 1. Construct items and loadings

Constructs	Items	Loadings
Crowdsourcing Capability	We can identify the necessary characteristics	0.782
	We can find and reach the right crowdsolvers	0.814
	We can identify the necessary expertise for crowdsolvers	0.801
	We can identify the problem	0.798
	We can convert problems into specific questions	0.775
	We can solve problems	0.743
	We can invite many crowdsolvers to participate	0.785
	We can motivate crowdsolvers to perform their best for us	0.813
	We can evaluate crowdsolvers' usability ideas effectively	0.822
	We can establish criteria before assessing ideas from the crowdsolvers	0.790
	We allow the appropriate crowdsolvers to select valuable ideas	0.790
	In general, our company can accept new ideas for products.	0.822
New Product Development	In general, our company can produce creative new products.	0.838
	In general, our company can develop attractive new products.	0.811
	In general, our company can commercialize the new product	0.828

To ensure the reliability of the items, it is advisable for the observed variables to demonstrate a loading of at least 0.6 on a latent variable (Hair et al., 2021). Table 1 presents the results, indicating that all constructs meet the criteria for item reliability, with each item demonstrating a loading of 0.60 or higher. Similarly, all constructs demonstrate Cronbach's alphas and CR values exceeding the threshold of 0.7. Subsequently, an evaluation of the convergent validity of the construct was conducted. A comprehensive examination was undertaken to assess if the average variance extracted (AVE) for each construct exceeded the predetermined threshold of 0.50 (Hair et al., 2021). The results obtained from the study clearly indicate that the AVE for crowdsourcing capability is 0.628, while the AVE for initiatives in new product development is 0.680. All constructs examined in the research have statistically surpassed the established threshold. The evidence presented provides substantial support for the convergent validity of the aforementioned constructs. The data related to CR, CA, and AVE are presented in Table 2.

Table 2. CA, CR, convergent validity

Constructs	AVE	CA	CR
Firm size (M1)	1.000	1.000	1.000
M1*CC	1.000	1.000	1.000
Business type (M2)	1.000	1.000	1.000
M2*CC	1.000	1.000	1.000
Crowdsourcing Capability (CC)	0.628	0.941	0.949
New Product Development (NPD)	0.680	0.844	0.895

In the study, establishing discriminant validity among the constructs was a pivotal step in the Structural Equation Modeling (SEM) analysis. To rigorously assess this validity, two widely recognized methods were used. Firstly, the Fornell-Larcker criterion was applied, comparing the square root of the Average Variance Extracted (AVE) for each construct with its correlations with other constructs. As presented in Table 3, the square root of the AVE for Crowdsourcing Capability (CC) was found to be 0.792, while for New Product Development (NPD), it was 0.825. These values, highlighted in bold along the diagonal, unequivocally demonstrate that the variance explained by the items within each construct is significantly higher than their correlations with other constructs, affirming the presence of discriminant validity. This meticulous application of the Fornell-Larcker criterion assures the proper specification of the measurement model and the distinctiveness of the studied constructs. Secondly, a Heterotrait-Monotrait Ratio (HTMT) analysis was conducted, presented in Table 4, as an additional method to assess discriminant validity in SEM. HTMT ratios below the threshold of 0.85, as recommended by Kline (2023), indicate discriminant validity. In the study, all HTMT ratios for Firm Size (M1), Business Type (M2), Crowdsourcing Capability (CC), and New Product Development (NPD) are substantially below this threshold. This compelling evidence further validates the discriminant validity among the constructs, confirming their distinctiveness and the robustness of the SEM analysis.

Table 3. Discriminant validity using the Fornell-Larcker criterion

Constructs	1	2	3	4
Firm Size (M1)	1.000			
Business Type (M2)	-0.021	1.000		
Crowdsourcing Capability (CC)	-0.075	0.738	0.792	
New Product Development (NPD)	-0.071	0.493	0.650	0.825

In Table 5, the key metrics used to evaluate the predictive accuracy and relevance of the variables in the model are presented. These metrics serve as critical indicators of the model's performance. The R-squared (R^2) value of 0.458 suggests that the model accounts for approximately 45.8% of the variability in NPD. This indicates its ability to explain a significant portion of the variability in this particular variable. The adjusted R-squared value, which is 0.446 in this case, adjusts for the complexity of the model by considering the number of predictors. This value represents the proportion of variance explained while considering the intricate nature of the model. Additionally, the Q-squared (Q^2) value of 0.283 evaluates the predictive relevance, demonstrating the model's capability to generate precise predictions beyond the given sample data. Collectively, the results confirm that the predictive model for NPD demonstrates commendable accuracy and relevance, capturing a substantial amount of the inherent variability in the variable.

The assessment of the structural model involved a comprehensive analysis of key metrics to evaluate the hypotheses (Hair et al., 2021). Specifically, the structural path coefficient (β) and the t-values obtained through the bootstrap approach were examined. A summary of the crucial findings is presented in Table 6.

Table 6 displays the outcomes of the structural model, illustrating the relationships and connections among the different constructs in the study. The correlation values indicate not only the strength of these relationships but also their direction.

Initially, Hypothesis 1 ($H1$) posits a correlation between Crowdsourcing Capability (CC) and New Product Development (NPD). The correlation value of 0.746 signifies a substantial positive correlation between CC and NPD. The statistical analysis, with a t-value of 7.429 and a p-value of 0.000, confirms a statistically significant relationship. Consequently, Hypothesis 1 is supported, affirming a significant and positive association between CC and NPD.

Subsequently, Hypothesis 2 ($H2$) suggests a relationship between the size of the firm and its interactions ($M1*CC$) with the criterion variable NPD. Despite the relatively modest correlation value of 0.103, indicating a positive connection between

Table 4. Discriminant validity using the Heterotrait-Monotrait Ratio (HTMT)

Constructs	M1	M1*CC	M2	M2*CC	CC	NPD
Firm Size (M1)						
M1*CC	0.030					
Business Type (M2)	0.021	0.094				
M2*CC	0.081	0.106	0.222			
Crowdsourcing Capability (CC)	0.078	0.142	0.765	0.509		
New Product Development (NPD)	0.075	0.203	0.534	0.203	0.725	

Table 5. Predictive accuracy and relevance

Construct	Predictive accuracy		Predictive relevance
	R^2	Adjusted R^2	Q^2
New Product Development (NPD)	0.458	0.446	0.283

Table 6. Structural model

	Correlation	Original	Mean	Std. Deviation	t-value	p-value	Conclusion
H1	CC → NPD	0.746	0.761	0.100	7.429	0.000	Supported
H2	M1*CC → NPD	0.103	0.100	0.061	1.701	0.045	Supported
H3	M2*CC → NPD	0.157	0.156	0.069	2.275	0.012	Supported

M1*CC and NPD, the statistical analysis, featuring a t-value of 1.701 and a p-value of 0.045, lends support to Hypothesis 2. This outcome implies a significant correlation between M1*CC and NPD.

Likewise, Hypothesis 3 (*H3*) scrutinizes the correlation between the type of business and interactions (M2*CC) with NPD. The correlation value of 0.157 suggests a positive relationship between M2CC and NPD. The statistical analysis, yielding a t-value of 2.275 and a p-value of 0.012, provides evidence supporting Hypothesis 3. This indicates a significant correlation between M2*CC and NPD.

4. DISCUSSION

This section focuses on the primary research objectives, particularly examining the impact of social media-enabled crowdsourcing capabilities on new product development. The analysis, based on a sample of 217 business owners and managers, revealed that all participants use social media to enhance their marketing efforts. Upon closer examination, as a second-order construct, it is evident that crowdsourcing capabilities significantly influence new product development (*H1*). This capability is closely tied to an organization's proficiency in defining problems and understanding the expertise required for collaborative solutions. SME owners and managers can effectively engage external crowdsolvers and align specific issues with their expertise using a strategic approach. Well-defined problems serve as a powerful motivator for crowdsolvers, driving them to contribute their valuable skills, ultimately resulting in the generation of higher-quality solutions. Crowdsolvers, who are typically well-versed in the field of crowd marketing, tend to select activities that align closely with their qualifications and areas of expertise. Aligned with the perspective of Randhawa et al. (2019), organizations identified as "seekers" actively engage with an external group comprising potential problem solvers. This underscores the proactive role of organizations in seeking solutions from external contributors. SME owner-managers who can accurately identify and articulate these problems have a higher likelihood of attracting highly skilled problem solvers. The success of SMEs in leveraging crowdsourcing capabilities hinges on their ability to inspire and continuously motivate

crowdsolvers throughout the entire process. This motivation is crucial for optimizing the contributions of crowdsolvers and achieving the best possible outcomes. Crowdsourcing capabilities extend to the evaluation of ideas proposed by crowdsolvers. Consistent with the insights provided by Köhler and Chesbrough (2019), organizations adeptly leverage various expertise. This broadens the understanding of the strategic importance of an organization's ability to utilize diverse knowledge. Through careful management and integration of various expertise, organizations create a supportive environment for generating innovative solutions. Once significant contributions have been made, companies must carefully analyze and select the most optimal solutions. This step is particularly important because crowdsolvers often present multiple alternative solutions. The ability to discern and choose the most suitable option is imperative for effective crowdsourcing.

Based on empirical evidence, the research supports the hypothesis (*H2*) that firm size significantly influences the relationship between SME crowdsourcing capabilities and new product development. Firm size emerges as a critical factor affecting strategic decision-making and the ability to leverage crowdsourcing for innovation. Firms of varying sizes use different strategies and possess unique capabilities. Larger firms, with extensive internal resources and established processes, have distinct advantages in managing crowdsourcing activities effectively. However, their organizational complexity and internal structures may pose challenges in seamlessly integrating external inputs, aligning with Pollok et al.'s (2019) observations regarding potential difficulties for larger firms.

Additionally, larger firms benefit from a broader market reach and enhanced access to current market trends, enabling them to generate innovative ideas in response to evolving market dynamics. On the other hand, smaller firms can achieve similar goals by utilizing social media-enabled crowdsourcing. Smaller firms, known for their flexibility and streamlined bureaucratic processes, can adapt more readily. This aligns with Yang and Han's (2021) perspective, emphasizing crowdsourcing as a way for smaller firms to overcome resource constraints. The organizational flexibility of smaller

firms enables them to swiftly incorporate external inputs into their product development processes, as highlighted by Pollok et al. (2019).

Despite larger firms' advantages, they may resist change and innovation, often prioritizing efficiency over innovative practices. Innovation serves as a valuable tool for SMEs to explore new opportunities and build connections with partners offering valuable resources and capabilities. This, in turn, facilitates the generation of innovative ideas crucial for developing superior new products.

The empirical evidence strongly suggests that the type of business managed by SMEs plays a significant role in moderating the relationship between their crowdsourcing capabilities and the development of new products. This finding supports the third hypothesis (*H3*), highlighting the impact of the business type on SMEs' capacity to effectively utilize crowdsourcing for new product development. In the present business environment, a growing number of SMEs are actively considering crowdsourcing as a valuable mechanism for driving the development of new products. This strategic approach enables these companies to accelerate the process of conceptualizing and developing innovative products that are in line with market demands. However, the success of such initiatives depends on various factors, including the specific type of business in which the SME operates. In the fashion industry, which heavily relies on creative and customized design solutions, SMEs often encounter challenges due to their limited access to skilled designers and the accompanying resources. Crowdsourcing in the fashion sector has the potential to become a transformative strategy. It entails actively engaging with a diverse and extensive group of designers and creators through open invitations. This allows SMEs to acquire initial design concepts and subsequently refine them into high-quality products. The practice of crowdsourcing in fashion design provides several advantages, particularly the opportunity to acquire a diverse range of high-quality design ideas at a comparatively low cost (Jiao et al., 2021). This illustrates how the nature of the business, especially in the sector of fashion, can greatly impact the effectiveness of crowdsourcing as a method for generating innovative product concepts.

The empirical evaluation of the model establishes a solid foundation, providing compelling evidence for the relationship between crowdsourcing capabilities and the development of new products. These findings hold great significance for scholars and academics, as they can integrate these insights into the wider framework of crowdsourcing models that are specifically designed for the requirements of SMEs. One important implication for business owners and managers that arises from this research is the recognition that SMEs' crowdsourcing capabilities should focus on key aspects of the crowdsourcing process. This strategic focus enables SMEs to discover innovative solutions for new product development that align with customer expectations, ultimately resulting in the creation of more appealing and competitive products. Therefore, it is crucial for business owners and managers to have a thorough grasp of how to accurately define problems, identify the most suitable crowdsolvers, motivate participants engaged in crowdsourcing activities, and rigorously evaluate the quality of ideas and solutions generated. This study not only provides valuable insights for the academic discourse on crowdsourcing but also offers practical takeaways for business practitioners who aim to utilize crowdsourcing for improved new product development and customer satisfaction.

There are several limitations that need to be taken into consideration in the study. One notable limitation is the relatively small sample size of only 217 business owners and managers. In the present digital landscape, only a small portion of SMEs actively participate in social media for the purpose of developing new products. Furthermore, an even smaller subset of these SMEs utilizes social media-enabled crowdsourcing. Hence, it is possible that the findings may not fully capture the behaviors and practices of the broader SME population regarding this matter. Another limitation arises from the study's narrow focus solely on the province of North Sumatra, Indonesia. Hence, it is possible that the findings may not have generalizability on a nationwide or cross-country level. To enhance the robustness and pertinence of the research, future studies should consider broadening the geographical scope. This would entail incorporating a wider range of locations that are more diverse and inclusive, thereby ensuring a higher

level of representation. Despite these limitations, the study highlights the potential of crowdsourcing for SMEs on social media as a powerful mechanism for idea generation and problem-solving,

particularly in the context of new product development. These findings offer valuable insights for SMEs seeking innovative strategies to overcome challenges and improve their product offerings.

CONCLUSION

The aim of this study was to investigate how crowdsourcing capabilities influence new product development initiatives, while also examining how this is influenced by the size and type of the company. The results of the empirical analysis indicate that crowdsourcing capabilities positively and significantly affect new product development. Furthermore, it was found that this relationship is influenced by the size and type of the company, indicating that the impact of crowdsourcing capabilities on new product development may vary depending on the characteristics of the company. This study highlights the importance for organizations to effectively leverage crowdsourcing to generate successful new products. Therefore, owners and managers of small and medium-scale enterprises (SMEs) are encouraged to harness the collective intelligence and creativity of various parties. This enables companies to access a wide range of ideas, perspectives, and expertise that can drive the innovation process and result in the development of new products. Although larger companies may have broader resources and a better ability to leverage crowdsourcing initiatives, many small businesses operating in creative sectors, such as the fashion business, may have an advantage in adopting and transforming external contributions into successful new products. Fashion companies often rely on creativity, innovation, and design, which align well with the utilization of crowdsourcing for developing new products. Meanwhile, although culinary businesses are also innovative and creative in their field, their categorization often differs from industries like fashion. However, owners and managers of culinary businesses can also benefit from crowdsourcing initiatives, particularly in areas such as recipe development, menu planning, and customer engagement strategies.

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REFERENCES

1. Afuah, A., & Tucci, C. (2012). Crowdsourcing As a Solution to Distant Search. *Academy of Management Review*, 37(3), 355-375. <http://dx.doi.org/10.5465/amr.2010.0146>
2. Basit, S. A. (2021). The effect of external knowledge sources on organizational innovation in small and medium enterprises in germany. *Business Systems Research: International journal of the Society for Advancing Innovation and Research in Economy*, 12(1), 60-79. Retrieved from <https://sciendo.com/es/article/10.2478/bsrj-2021-0005>
3. Beretta, M., & Søndergaard, H. A. (2021). Employee behaviours beyond innovators in internal crowdsourcing: What do employees do in internal crowdsourcing, if not innovating, and why? *Creativity and Innovation Management*, 30(3), 542-562. <https://doi.org/10.1111/caim.12449>
4. Castillo, V. E., Bell, J. E., Rose, W. J., & Rodrigues, A. M. (2018). Crowdsourcing last mile delivery: strategic implications and future research directions. *Journal of Business Logistics*, 39(1), 7-25. <https://doi.org/10.1111/jbl.12173>
5. Chaotechuang, P., & Mariano, S. (2016). Alignment of new product development and product innovation strategies: a case study of Thai food and beverage SMEs. *International Journal of Globalisation and Small Business*, 8(2), 179-206. <http://dx.doi.org/10.1504/IJGSB.2016.078821>
6. Cheng, C. C., & Shiu, E. C. (2019). How to enhance SMEs customer involvement using social media: The role of Social CRM. *International Small Business Journal*, 37(1), 22-42. <https://doi.org/10.1177/0266242618774831>
7. Cricelli, L., Grimaldi, M., & Vermicelli, S. (2021). Crowdsourcing and open innovation: a systematic literature review, an integrated framework and a research agenda. *Review of Managerial Science*, 1-42. Retrieved from <https://link.springer.com/article/10.1007/s11846-021-00482-9>
8. Devece, C., Palacios, D., & Ribeiro-Navarrete, B. (2019). The effectiveness of crowdsourcing in knowledge-based industries: the moderating role of transformational leadership and organisational learning. *Economic research-Ekonomska istraživanja*, 32(1), 335-351. Retrieved from <https://ideas.repec.org/a/taf/re-roxx/v32y2019i1p335-351.html>
9. Faullant, R., Füller, J., & Hutter, K. (2017). Fair play: Perceived fairness in crowdsourcing competitions and the customer relationship-related consequences. *Management Decision*, 55(9), 1924-1941. Retrieved from <https://www.emerald.com/insight/content/doi/10.1108/MD-02-2017-0116/full/html>
10. Gruner, R. L., & Power, D. (2017). What's in a crowd? Exploring crowdsourced versus traditional customer participation in the innovation process. *Journal of Marketing Management*, 33(13-14), 1060-1092. <http://dx.doi.org/10.1080/0267257X.2017.1325389>
11. Gu, Z., Bapna, R., Chan, J., & Gupta, A. (2022). Measuring the impact of crowdsourcing features on mobile app user engagement and retention: A randomized field experiment. *Management Science*, 68(2), 1297-1329. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3057424
12. Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage Publications. Retrieved from <https://us.sagepub.com/en-us/nam/a-primer-on-partial-least-squares-structural-equation-modeling-pls-sem/book270548>
13. Herter, M. M., Shuqair, S., Pinto, D. C., Mattila, A. S., & Zandonai Pontin, P. (2023). Does crowdsourcing necessarily lead to brand engagement? The role of crowdsourcing cues and relationship norms on customer-brand relationships. *Journal of Product & Brand Management*. <https://doi.org/10.1108/JPBM-06-2022-4020>
14. Jiao, Y., Wu, Y., & Lu, S. (2021). The role of crowdsourcing in product design: The moderating effect of user expertise and network connectivity. *Technology in Society*, 64, 101496. <https://doi.org/10.1016/j.techsoc.2020.101496>
15. Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications. Retrieved from <https://www.routledge.com/Principles-and-Practice-of-Structural-Equation-Modeling-Fifth-Edition/Kline/p/book/9781462551910>
16. Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, 11(4), 1-10. Retrieved from https://cits.tamtu.edu/kock/pubs/journals/2015JournalIJeC_CommonMethBias/Kock_2015_IJeC_CommonMethodBiasPLS.pdf
17. Kock, N., & Lynn, G. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7). Retrieved from <https://aisel.aisnet.org/jais/vol13/iss7/2/>
18. Köhler, T. (2018). How to scale crowdsourcing platforms. *California Management Review*, 60(2), 98-121. <https://doi.org/10.1177/0008125617738261>
19. Köhler, T., & Chesbrough, H. (2019). From collaborative community to competitive market: The quest to build a crowdsourcing platform for social innovation. *R&D Management*, 49(3), 356-368. <https://doi.org/10.1111/radm.12372>
20. Konhäusner, P. (2021). Crowdsourcing in Sustainable Retail – A Theoretical Framework of Success Criteria. *Journal of Risk and Financial Management*, 14(2), 87. <http://dx.doi.org/10.3390/jrfm14020087>
21. Li, J., Liu, C., Zeng, X., & Zhang, N. (2018). Optimization and coordination of crowdsourcing supply chain in fast fashion industry. *Mathematical Problems*

- in *Engineering*, 1-16. <https://doi.org/10.1155/2018/8123169>
22. Li, J., Yu, Y., & Liu, C. (2021). Product design crowdsourcing in a dual-channel supply chain: joint reviews from manufacturer and consumers. *International Transactions in Operational Research*, 28(2), 784-808. <https://doi.org/10.1111/itor.12749>
 23. Lin, L., Shen, H., Liu, S., Xu, L., & Cheng, X. (2022). On the cybernetics of crowdsourcing innovation: A process model. *IEEE Access*, 10, 27255-27269. Retrieved from <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9720929>
 24. Ma, C., Yang, Z., Yao, Z., Fisher, G., & Fang, E. E. (2012). The effect of strategic alliance resource accumulation and process characteristics on new product success: Exploration of international high-tech strategic alliances in China. *Industrial Marketing Management*, 41(3), 469-480. <https://doi.org/10.1016/j.indmarman.2011.04.001>
 25. Mansor, M. F., Abu, N. H., Halim, H. A., & Ahmad, N. H. (2022). Revisiting SMEs' Business Strategy: Shifting Outsourcing to Crowdsourcing Practices to Enhance SMEs' Performance. *Jurnal Pengurusan*, 66. Retrieved from <https://journalarticle.ukm.my/21080/1/55345-200264-2-PB.pdf>
 26. Martinez-Corral, A., Grijalvo, M., & Palacios, M. (2019). An organisational framework for analysis of crowdsourcing initiatives. *International Journal of Entrepreneurial Behavior & Research*, 25(8), 1652-1670. <https://doi.org/10.1108/IJEBR-06-2018-0402>
 27. Metwaly, A., ElKattan, A., & Kaoud, M. (2022). Toward an Egyptian managerial framework based on crowdsourcing for open innovation. *American Journal of Business*, 37(1), 14-33. <http://dx.doi.org/10.1108/AJB-08-2020-0126>
 28. Nishikawa, H., Schreier, M., Fuchs, C., & Ogawa, S. (2017). The value of marketing crowdsourced new products as such: Evidence from two randomized field experiments. *Journal of Marketing Research*, 54(4), 525-539. <https://doi.org/10.1509/jmr.15.0244>
 29. Ofori-Amanfo, J., Akonsi, S. W., & Agyapong, G. K. Q. (2022). The impact of organisational capabilities on the performance of small- and medium-sized enterprises (SMEs). *European Business Review*, 34(5), 642-665. <http://dx.doi.org/10.1108/EBR-06-2021-0139>
 30. Pacauskas, D., Rajala, R., Westerlund, M., & Mäntymäki, M. (2018). Harnessing user innovation for social media marketing: Case study of a crowdsourced hamburger. *International Journal of Information Management*, 43, 319-327. <https://doi.org/10.1016/j.ijinfomgt.2018.08.012>
 31. Poetz, M. K., & Schreier, M. (2012). The value of crowdsourcing: can users really compete with professionals in generating new product ideas? *Journal of Product Innovation Management*, 29(2), 245-256. <https://doi.org/10.1111/j.1540-5885.2011.00893.x>
 32. Pollok, P., Lüttgens, D., & Piller, F. T. (2019). How firms develop capabilities for crowdsourcing to increase open innovation performance: The interplay between organizational roles and knowledge processes. *Journal of Product Innovation Management*, 36(4), 412-441. <https://doi.org/10.1111/jpim.12485>
 33. Qin, S., Van der Velde, D., Chatzakis, E., McStea, T., & Smith, N. (2016). Exploring barriers and opportunities in adopting crowdsourcing based new product development in manufacturing SMEs. *Chinese Journal of Mechanical Engineering*, 29, 1052-1066. <http://dx.doi.org/10.3901/CJME.2016.0808.089>
 34. Randhawa, K., Wilden, R., & West, J. (2019). Crowdsourcing without profit: the role of the seeker in open social innovation. *R&D Management*, 49(3), 298-317. <https://doi.org/10.1111/radm.12357>
 35. Salisu, Y., & Bakar, L. J. A. (2019). Technological capability, relational capability and firms' performance: The role of learning capability. *Revista de Gestão*, 27(1), 79-99. <https://doi.org/10.1108/REG-03-2019-0040>
 36. Sesale, E. L., & Seeletse, S. M. (2017). Marketing fortification of business through crowdsourcing and social responsibility: focus on South African SMEs. *Environmental Economics*, 8(1), 18-25. [http://dx.doi.org/10.21511/ee.08\(1\).2017.02](http://dx.doi.org/10.21511/ee.08(1).2017.02)
 37. Soon, J. M., & Saguy, I. S. (2017). Crowdsourcing: A new conceptual view for food safety and quality. *Trends in food science & technology*, 66, 63-72. <https://doi.org/10.1016/j.tifs.2017.05.013>
 38. Sun, Y., Tuertscher, P., Majchrzak, A., & Malhotra, A. (2020). Pro-socially motivated interaction for knowledge integration in crowd-based open innovation. *Journal of Knowledge Management*, 24(9), 2127-2147. <https://doi.org/10.1108/JKM-04-2020-0303>
 39. Wang, G., & Yu, L. (2020). Analysis of enterprise sustainable crowdsourcing incentive mechanism based on principal-agent model. *Sustainability*, 12(8), 3238. <https://doi.org/10.3390/su12083238>
 40. Wang, L., Xu, T., & Chen, J. (2020). Research on decision-making behavior of crowdsourcing task based on loss aversion and incentive level. *Kybernetes*, 49(5), 1507-1528. <http://dx.doi.org/10.1108/K-12-2018-0689>
 41. Whitla, P. (2009). Crowdsourcing and its application in marketing activities. *Contemporary Management Research*, 5(1). <http://dx.doi.org/10.7903/cmr.1145>
 42. Yang, M., & Han, C. (2021). Stimulating innovation: Managing peer interaction for idea generation on digital innovation platforms. *Journal of Business Research*, 125, 456-465. <https://doi.org/10.1016/j.jbusres.2019.08.005>
 43. Zahay, D., Hajli, N., & Sihi, D. (2018). Managerial perspectives on crowdsourcing in the new product development process. *Industrial Marketing Management*, 71, 41-53. <https://doi.org/10.1016/j.indmarman.2017.11.002>