

Limitations of Application Open Innovation for Increasing the Performance of Craft SMEs in Sleman, Indonesia

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ABSTRACT

Indonesian small and medium enterprises (SMEs) are increasing but face many challenges in developing their business. This study proposes a combination of open innovation (OI) and engagement theory. Preliminary interviews were conducted with local government officials (external stakeholders) and managers of craft SMEs in Sleman. The results show that the biggest challenge for handicraft SMEs in Sleman is the lack of innovation in marketing and production. This study aims to analyze open innovation in the craft industry with the support and participation of various parties using the basic theory of involvement. This study uses 200 handicraft SMEs manager respondents in Sleman. The method used in this research is quantitative. The analysis tool used is PLS-SEM. The research results show that the OI model is acceptable, and all the proposed hypotheses are supported: Resource Constraints affect OI limitation; the Engagement Mechanism affects the limitations of OI; and Knowledge barriers affect OI limitation.

Keywords: Open innovation; engagement theory; SMEs performance.

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1. INTRODUCTION

As part of the Industrial Revolution 4.0, SMEs are starting to use digital media to support their business goals and activities. This digital media can improve company performance (Dirgiatmo *et al.*, 2020). SMEs can achieve superior innovation results in their performance (Oshima & Toma, 2023). Namely, SMEs must develop a solid and appropriate strategy to encourage employees to always be creative. This is generally referred to as an organizational culture for innovation, and it emerges when

someone leads it with a broad vision and can convey it to employees. Leaders will encourage employee collaboration while giving them the freedom to innovate. Companies are also directed to consistently create, communicate and provide value to customers and provide them with the best service (Kubberod *et al.*, 2019). Sometimes, open innovation in SMEs cannot always stand alone. This open innovation must be combined with other factors, such as entrepreneurship.

Entrepreneurship promotion is needed first before investigating the open innovation strategy of SMEs. As a result, entrepreneurship has proven successful in realizing open innovation and became the essence of the early strategy for SMEs that focused on rapid international expansion (Mawson & Brown, 2017). The National Economic and Industrial Committee stated that SMEs are a sector that has great potential, and around 98.7% of businesses in Indonesia are micro businesses. The contribution of SMEs to Indonesia's Gross Domestic Product reached 36.82%. SMEs in Indonesia continue to experience development and increase to more than 57.9 million units in 2021. Seeing SMEs' rapid development, competition among SMEs, and the struggle for market share is getting tougher. Therefore, SMEs need the right business strategy or strategic management so that these SMEs can survive and develop even better. SMEs have an essential role to play in supporting Indonesia's economic development. Budi *et al.* (2020) state that there are several other obstacles—both internal and external for SMEs. Internal barriers include low institutional and human resources, slow technology adoption, and marketing difficulties.

Lee & Le (2021) stated that literature on innovation still rarely explains the barriers to successful implementation. Previous research illustrates the success and benefits of involving external actors in new product development. The benefits organizations can explain the popularity of open innovation receive widely. The benefits of open innovation for organizations differ from traditional innovation, including discovering unexpected opportunities or new business ideas, reduced costs and time to market, and access to external resources (Abhari & McGuckin (2023). On the other hand, open innovation is also beneficial. However, it is accompanied by unavoidable adverse impacts and increased costs. Open innovation failure is one of the biggest obstacles facing companies today.

This phenomenon of SMEs is interesting to study because of their resilience in facing various challenges. Wijaya & Suasih (2021) stated that the proliferation of SMEs in Indonesia is the creative industry, especially craft SMEs. The Indonesian Ministry of Trade noted that one of the high values. Even though SMEs in Indonesia look very advanced, they face many challenges in developing their businesses (Iriyanto *et al.*, 2021). Yun *et al.* (2016) stated that open innovation can enable SMEs to survive. Open innovation assumes that an organization depends not only on its technology to innovate but also on external knowledge and other technologies (such as user innovation, customer innovation, collective intelligence, and crowdsourcing).

Craft SMEs are selected as the target for open innovation research because craft SMEs have a big chance of adopting open innovation. Craft SMEs need creative ideas to improve their performance. However, this craft SME innovation idea has many obstacles in its implementation. Craft SMEs have a vital role in supporting economic development. The phenomenon of craft SMEs in Indonesia is interesting to study because SMEs currently face various challenges in implementing open innovation. Open innovation demonstrates how a company can use its business model to find more enlightened R&D roles in an information-abundant world, better manage

and access intellectual property, advance its current business, and develop the business of tomorrow. This study aims to analyze the various challenges faced by SMEs. This research combines open innovation and engagement theory to encourage every craft industry stakeholder to understand their respective roles and functions, especially in helping craft SMEs overcome challenges and develop innovation.

2. LITERATURE REVIEW

1.1. Open innovation (OI)

Open innovation makes SMEs grow with emerging technology strategies, complex adaptive systems, and market response stimulated by technological innovation. SMEs are the main focus of driving evolution in the market and agents in implementing the innovation system (Lee & Le, 2021). Open innovation usually appears at the start of the industry, then declines when the industry is in the mature stage. The conditions for innovation allow for no significant technological differences between SMEs, and price competition becomes even more critical.

SMEs that continue to carry out open innovation will be able to dominate the market (Yun *et al.*, 2016). However, unfortunately, in practice, it is not exceeded because the SMEs that cultivate usually resist innovation. In addition, artisan SMEs cannot improve business performance capabilities to implement open innovation properly (Wijaya *et al.*, 2019). This condition generally occurs due to poor adoption of technology, regulations that bind the performance of SMEs, and lack of stakeholder participation (Yun *et al.*, 2016; De Marco *et al.*, 2020).

1.2. Limitations of Open Innovation

Research on the limitations of OI from Kohler and Nickel (2017) and Hofstetter *et al.* (2018) shows that OI models sometimes cannot achieve the most effective innovation results. Empirical evidence suggests that OI does not necessarily reduce new products' risk or failure rate (Kohler and Nickel, 2017; Ovuakporie *et al.*, 2021). In addition, the cost of implementing and running the OI model also does not provide much benefit. Abhari *et al.* (2022), Bhimani *et al.* (2019), Greco presents several factors that limit the success of OI.

Abhari & McGuckin (2023) show three factors inhibiting the success of open innovation. (1) Limiting strategic factors. (2) Limiting process factors. (3). Limiting community factors. This study analyzes the barriers to open innovation from the factors of Resource Constraints, Engagement Mechanisms, and Knowledge Barriers, which are adopted from the dimensions of OI barriers from Abhari & McGuckin (2023).

1.3. Resource Constraints

Resource Constraints faced by Handicraft SMEs are related to production costs which impact the financial decline and financial instability. Craft SMEs find it difficult to find bank loans due to their economies of scale and low profitability (Foltys *et al.*, 2015). Even though access to financial institutions is critical for craft SMEs to increase their innovation and competitiveness (Corte *et al.*, 2013). Funds are also crucial for craft SMEs to access needed resources (Kurniati *et al.*, 2019). According to Agyapong (2020), financial risks force SMEs to be more creative and innovative in their processes and procedures, resulting in increased efficiency. Torres de Oliveira *et al.* (2021), who surveyed the limitations of OI, revealed that 70% of SMEs lack the

financial resources to adopt OI practices effectively. Haim Faridian and Neubaum (2021); Filiou (2021) show that resource allocation determines innovation's priority.

Hypothesis 1: Limited resources affect the limitations of open innovation.

1.4. Engagement theory

Engagement theory is a model for learning in a technology-based environment. The first tenet of engagement theory is related. To face various challenges, SMEs must work together to improve communication, planning, management, and social skills. The following principle is to create, meaning that SMEs must identify challenges and focus on implementing ideas to solve them. The last principle is donation, which emphasizes that SMEs must provide value or contribution to outsiders, especially customers (Kearsley & Shneiderman, 1998).

According to Kearsley and Shneiderman (1998), engagement theory is widely used for education, but this theory can also be used to strengthen the implementation of open innovation in SMEs. This combination of open innovation and engagement theory is based on the opinion of Fauth *et al.* (2021), which states that integrating open innovation with engagement theory can enhance innovation, management, and an established economy in the future. Hardwick & Anderson (2019) and Zainal & Yong (2020) show that open innovation will likely be combined with engagement theory. Fauth *et al.* (2021) stated that stakeholder participation would shift company activities from closed to open innovation.

Meanwhile, Deltour (2021) states that strong bonds between business groups do not guarantee their open innovation or partnership engagement. When combined with a stakeholder-driven engagement process, open innovation offers solutions for all actors participating in the pro-process right up to industrial implementation (Veronica *et al.*, 2020; Fauth *et al.*, 2021). Mauson & Brown (2017) stated that open innovation could improve the involvement of SME managers better.

1.5. Engagement Mechanisms

Engagement mechanisms are activities carried out by SMEs to build effective engagement mechanisms in each network. At the operational level, having quality and productive innovation partners is critical to the success of the OI process. SMEs that lack the knowledge or resources to build effective engagement-based mechanisms can limit OI operations. According to Leckel *et al.* (2020); Yuan and Gasco-Hernandez (2021), failure of engagement mechanisms is always caused by mistargeting populations, giving unclear directions, failing to provide feedback, inhumane reward systems, and unfair compensation. Other studies from Abhari *et al.* (2022b); Suhada *et al.* (2021) also show the importance of non-financial motivation in motivating external parties in the OI community, such as the innovation market and the SPD platform.

The Social Product Development (SPD) platform is an OI model that uses social technology and social mechanisms to mobilize community members to participate in developing new products or services (Abhari *et al.*, 2022a). SPD offers a rich context for studying OI as it provides an end-to-end innovation cycle with varying qualities and functions of OI (Bhimani *et al.*, 2019; Abhari & McGuckin, 2023). SPD can provide learning and networking opportunities to increase collaborative engagement and participation (Abhari *et al.*, 2019). In addition, according to Barham *et al.* (2020), engagement mechanisms are also hampered by limited ideas and a lack of fair compensation, resulting in a lack of commitment

among external innovation partners (Bertello *et al.*, 2022).

Hypothesis 2: Engagement mechanisms affect the limitations of open innovation.

1.6. Knowledge Barriers

Knowledge Barriers are a limitation in recruiting qualified individual actors who have sufficient industry knowledge and skills. Human resources (HR) quality is the next challenge for craft SMEs. Improving HR quality is crucial for SMEs to improve their market orientation and business performance (Sukartini *et al.*, 2015). Moreover, the craft business is unique because its employees must have special skills and high creativity. Unfortunately, some SMEs have not prioritized employee growth skills. Knowledge barriers such as lack of technical knowledge mean that SMEs face additional barriers when turning to external sources for shared value creation and value capture (Bertello *et al.*, 2022; Bogers *et al.*, 2021). As a result, OI failed to meet the financiers' requirements, so SMEs could not expand their investments. SMEs should provide training or apprenticeships, especially for new and inexperienced employees.

Another thing is that the ability of SMEs to build partnerships with suppliers is still limited. This will pave the way for SMEs to market their products at more affordable prices and improve their performance (Oshima & Toma, 2023). Apart from quality, another HR challenge is employee regeneration. People are reluctant to learn craft skills and prefer to work in other fields. This condition places the craft business at risk of losing its successors in the future (Wanniarachchi *et al.*, 2020). Craft SMEs managed by parents will grow slowly. They prefer to be conservative by rejecting the entry of open innovation and maintaining the uniqueness of traditional designs. As a result, craft SMEs are slow to adapt to the ever-changing trends in the global market.

Hypothesis 3: Knowledge barriers affect the limitations of open innovation

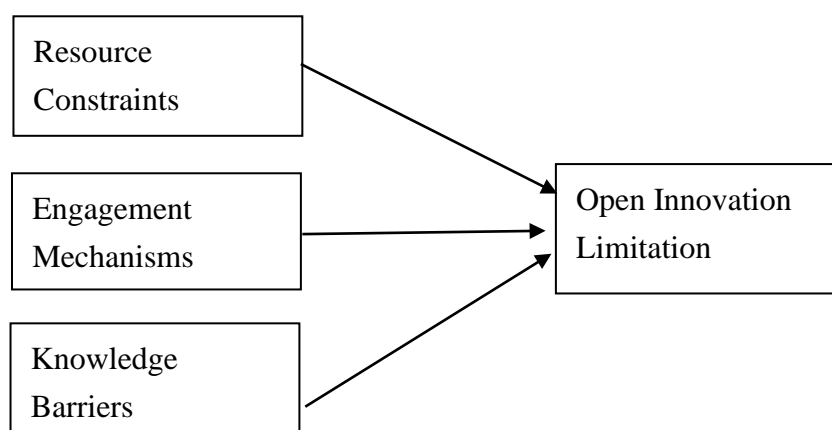


Figure 1. Conceptual Framework of Open Innovation Limitation

3. METHODS

This study analyzes the barriers to open innovation in SMEs in Sleman, Indonesia. The research uses a survey of UKM managers who have implemented open innovation and have problems implementing it. The sampling technique used is

convenience sampling because researchers already have restrictions on the samples for data collection. Questionnaires were distributed to 200 craft SMEs in Sleman. The measurement of several research variables was adopted from Abhari & McGuckin (2023). Resource Constraints are observed from limitations in securing, allocating, and maintaining the resources needed to operate and maintain OI. The involvement mechanism is adopted from indicators of limitations in the participation of internal and external parties through a reward system in the form of money and non-money. The knowledge barrier is measured by the limitations in recruiting qualified individuals with the required SME knowledge and skills. The limitations of OI are observed from the limitations of SMEs in monitoring, tracking, and integrating the contributions of OI members. Limitations of OI's goals related to resource allocation and implementation strategy. Limitations of individual and synergistic policies contributing to OI's organizational survival. This study uses Smart-PLS with the Structural Equation Model (SEM) approach.

4. RESULTS

4.1. Characteristics of respondents

This study used 200 respondents who are SMEs managers in Sleman. Research respondent data shows that the average UKM manager is male (72%). Average age 50-60 years (78%). The length of operation for SMEs is at least five years, and the average turnover per year is IDR 200 million.

4.2. Hypothesis test

The research results show that the Open Innovation Limitation model is accepted, and all the proposed hypotheses are supported. The R^2 value obtained in this study was 0.528. The results of the analysis of the validity and reliability of the measurement model show that all are valid and reliable. All constructs measured in this study have a Cronbach's alpha value greater than 0.70 and have good reliability with a composite reliability value greater than 0.5. The AVE value is good because all constructs are more significant than 0.5.

Table 1. The results of testing the research hypothesis using path analysis

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	t-statistics (O/STDEV)	p-values
Resource Constraints → Open Innovation Limitation	0.145	0.151	0.063	2.314	0.021
Engagement Mechanisms → Open Innovation Limitation	0.188	0.195	0.063	3.004	0.003
Knowledge Barriers → Open Innovation Limitation	0.550	0.545	0.064	8.651	0.000

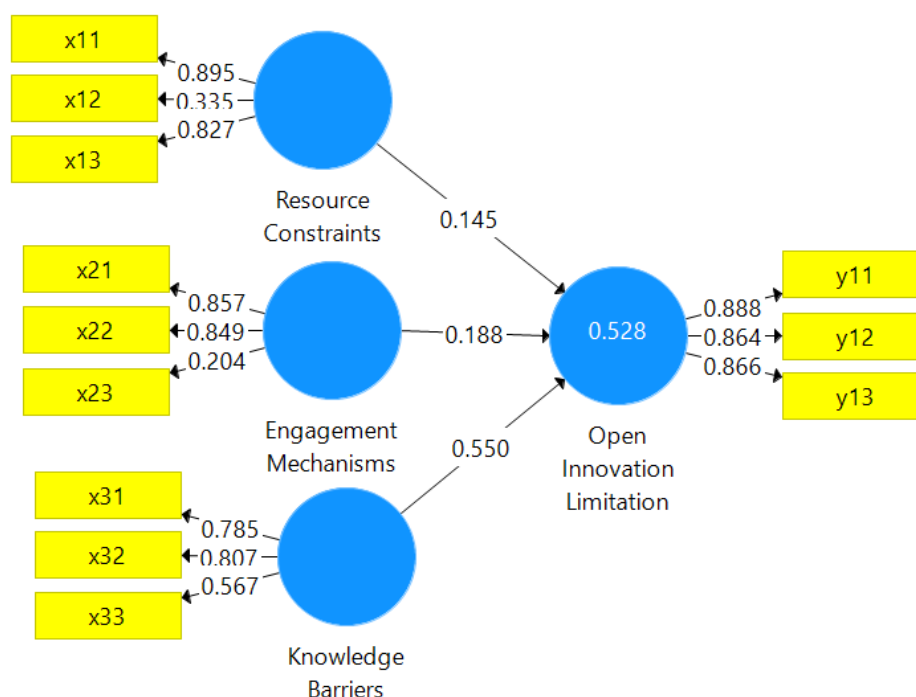


Figure 1. Model Open Innovation Limitation

5. DISCUSSION

The first hypothesis, which states that Resource Constraints affect OI limitation, is supported. The results of this study indicate that 90% of handicraft SMEs in Sleman mention a lack of financial resources to adopt OI practices effectively. This finding aligns with the opinion of Torres de Oliveira *et al.* (2021), which stated that many companies lacked financial resources when adopting OI. The cost of implementing OI in craft SMEs is high because it is related to scientific research that causes craft SMEs to redefine their OI goals. In line with Ovuakporie *et al.* (2021) state that if a company wants to increase growth rapidly, it must display new sources of initiative. Craft SMEs in Sleman have also been investing their limited resources in product development even though it has not been optimal. Limited resources owned by Sleman crafts SMEs have not been able to balance competing innovation priorities. These craft SMEs still have to survive in carrying out continuous production. From a broad strategic perspective, (Filiou 2021) & Ovuakporie *et al.*, 2021) suggest that SMEs will be successful in open innovation if their resource allocation finds the right balance between competing innovation priorities. Craft SMEs with defective products will face low profit margins due to high production costs. Another reason behind the resource constraints of Sleman handicraft SMEs is low customer demand due to the low quality of their products. Lack of cash flow and resource challenges led to delays in launching new products that were significant in generating revenue. The resource constraints faced by Sleman craft SMEs slowed down the successful implementation of OI.

The second hypothesis, which states that the Engagement Mechanism affects the limitations of OI, is supported. This shows that SMEs in Sleman have not created involvement between internal and external members in supporting open innovation. The failure of engagement mechanisms supports the opinion of Leckel *et al.* (2020) and Yuan and Gasco-Hernandez (2021), who state that engagement will fail if the directions given are unclear, there is no feedback, and the reward system is fair. This study also supports the findings of Abhari *et al.*, 2022b; Suhada *et al.*, 2021 which show the importance of non-financial motivation to motivate external parties in the OI community. The results of this study indicate that handicraft SMEs in Sleman have new ideas for various innovations in handicrafts. Unfortunately, the difficulty in incorporating new ideas into several craft innovations caused the ideas to become unutilized. Many inventors have offered partnerships with new ideas. On the SME side, the idea of this partnership is still not well captured; SMEs still want to stick to the status quo in their production life, which has been carried out so far. The government is redesigning the engagement between SMEs and their external partners to overcome this challenge and maintain engagement. The government has made many efforts, including improving education, social networking and validation, and sales networks. This engagement mechanism is sought to help members achieve marketing goals, help others, socialize, and contribute significantly to the SME community craft.

The third hypothesis, which states that knowledge barriers affect OI limitation, is supported. The results of this study support the findings of Abhari & McGuckin (2023), which state that although many internal and external actors are involved in the OI process, OI still causes failure. OI failures arise due to competition of ideas, knowledge barriers, value chain access, and security. Craft SMEs in Sleman. Knowledge Barriers are limitations to getting qualified individuals with sufficient industrial knowledge and skills faced by Sleman craft SMEs. This finding is in line with Bertello *et al.* (2022) and Bogers *et al.* (2021), who state that the quality of human resources is a challenge for SMEs to improve their market orientation and business performance. Many Sleman handicraft SMEs also fail to obtain capital for their investment due to a lack of technical knowledge and shared value creation. This finding agrees with Chaudhary *et al.* (2022), which states that OI failed to meet the financiers' requirements, so SMEs could not expand their investments. Torres de Oliveira *et al.* (2021) also stated that access to qualified external contributors is among the most common barriers to OI success. In highly specialized sectors such as SMEs, OI is constrained by a lack of external actors with sufficient industry knowledge (Lai-Yin Cheah *et al.*, 2021); Chaudhary *et al.*, 2022).

6. CONCLUSIONS AND RECOMMENDATIONS

This study examines the OI limitation model, which is influenced by resource constraints, engagement, and knowledge. The analysis results show that the model is acceptable, and all hypotheses are supported. Knowledge Barriers had the most significant effect on open innovation limitations. This is because the managers of craft SMEs and employees in the Sleman area have a low level of knowledge about innovation or creative ideas. These SMEs usually produce based on the hereditary knowledge they have inherited from their parents' expertise. So, the open innovation expected to be applied to craft SMEs in Sleman is low; suggestions that can be submitted to increase OI innovation in Sleman craft SMEs are: (1) SMEs must

provide training or apprenticeships, especially for new and inexperienced employees. (2) The government should support improving the ability of craft SMEs to build partnerships with suppliers, the government, and other craft SMEs. (3) To improve the bargaining position of craft SMEs in Sleman, the attachment between craft SMEs also needs to be improved. This will pave the way for SMEs to market their products at more affordable prices and improve their performance. (4) Apart from quality, another HR challenge is employee regeneration. People are reluctant to learn craft skills and prefer to work in other fields. This condition places the craft business at risk of losing its successors in the future. Craft SMEs managed by parents will grow slowly. They prefer to be conservative by rejecting the entry of open innovation and maintaining the uniqueness of traditional designs. As a result, craft SMEs are slow to adapt to the ever-changing trends in the global market. This study also suggests several things related to the development of open innovation theory. Abhari and McGuckin (2023) has conducted theoretical mapping and case studies on open innovation and its obstacles. This study only uses several dimensions of the open innovation variable proposed by Abhari and McGuckin (2023). So, in future research, it is best if all variables with the Oi dimension studied by this study and Abhari and McGuckin (2023) can be analyzed together. Strategic, process, and community factors related to OI can be further analyzed.

The practical contribution of this research shows that further research into the limitations of OI is more necessary than ever. According to Abhari and McGuckin (2023), many companies have closed their customer innovation communities, leaving OI unable to achieve effective innovation results. Practical evidence also shows that OI does not necessarily reduce new products' risk or failure rate. The cost of implementing and running an OI model is disproportionate to the benefits. Thus, understanding the negative impacts of the innovation process must be a primary concern in the successful implementation of OI in SMEs.

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