Two Views on Open Innovation: The Source of Dynamic Capabilities vs the Threat to Corporate Stability

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Abstract

Small and medium-sized businesses make a significant contribution to the national GDP in both developed and developing countries. It is a constant focus of research; transformation processes take place here, which can affect a variety of socioeconomic aspects. In recent decades, open innovation and digital transformation have emerged as the emerging drivers encouraging companies to transform their business models. Their skillful combination allows players to move into a qualitatively different category. For small and medium-sized businesses, both new opportunities and complex challenges arise, which require a certain level of training and competencies.

Using the example of Indonesian business, this article analyzes these processes and their effects in the form of natural flows of information, ideas, knowledge, and other resources. The pitfalls of open innovation are revealed. This study enriches the information and empirical base on the creative impact of open innovation on MSMEs and its enhancing effects of communication on digital platforms.

Keywords: open innovation; strategies; new business models; digital platform; company productivity; strategic partnership; research and development

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Introduction

Due to the increasing dynamics of change in technological, economic, social, and other dimensions, innovation has come to be seen as a key driver of growth and a competitive advantage at different levels - from individual companies and organizations to national economies. According to McKinsey, for 2021, 84% of surveyed top managers of companies consider the development of innovation a strategic priority, but only 6% of them are satisfied with the results achieved in this direction.[1] One of the key reasons for the gap between the desire to achieve higher levels of development through innovation and the actual situation with their implementation is the lack of a holistic strategy for managing "innovation for growth", harmoniously combined with the overall culture and development goals. A systematic approach to the implementation of innovation allows one to holistically manage a set of complex multidirectional processes, enhance their effects, and find new ways of development, but its formation and support pose a difficult challenge (Naqbia et al. 2020; Psomas et al., 2018).

The development and implementation of innovations are carried out in closed or open systems. In the first model, companies or organizations rely exclusively on their own assets at all stages: from research and development (R&D) to scaling and marketing. However, in a new increasingly complex and changing context (rapid updating and complication of technologies, products, business models, etc.), "closedness" no longer allows for maintaining the necessary dynamics of development. As a result, incentives to adopt the open innovation systems model first described in 2003 (Chesbrough, 2003) are growing. especially in the context of the digital transformation (Strazdas et al., 2014). The digital environment has enormous resources for growth, which you can take full advantage of when a closed approach is impossible.

In open ecosystems, companies can flexibly adjust strategies and master emerging complex cooperation schemes (Tobiassen, Pettersen, 2018).

In closed systems, the influx of external ideas is seen as a threat from possible competitors. A radically different perspective is offered by open systems, where such ideas are perceived as a valuable source of necessary diversity in the resources for innovation, the bearers of which are different types of partners, consumers, and other stakeholders. Internal ideas remain a valuable asset, but at the same time they are enriched by "outsider" developments, which turn into a colossal driving force of innovative co-creation. This combination provides fantastic choices from a rich array of ideas, fresh views, and unexpected decisions, which leads to more sophisticated mechanisms of cooperation not previously practiced (Chesbrough, 2003).

OI research is developing rapidly, especially in areas such as collaboration tools, strategic management, productivity, attitudes toward intellectual property rights, opportunity seeking, and the adoption of open-ended approaches at micro, small and medium enterprises (MSMEs) in different sectors (Bigliardi et al., 2020).

The modern economy increasingly relies on digital platforms (cloud resources, search engines, social networks, electronic trading platforms, etc.). As a result of these platforms' close interconnections, dynamic ecosystems are formed, the participants of which jointly create customer value by flexibly responding to market changes. As a result, transaction costs are reduced, the exchange of information about clients is enhanced, internal and external logistics are optimized, and overall management efficiency is increased (Arranz et al., 2023). Sectors with significant creativity are coming to the fore (Colapinto et al., 2012). Currently, interest in OI is growing in a variety of scientific disciplines (Bigliardi et al., 2020), and governments of many countries take this into account when formulating national development strategies (West et al., 2014).

IO activity is distributed unevenly in the business environment. The degree of its concentration largely depends on the scale of the business itself. Large companies are mastering this model more easily and more quickly than other categories of enterprises. Based on their achievements and experience, reliable trajectories have emerged that many MSMEs can follow (Van De Vrande et al., 2009; Wynarczyk, 2013; Hinteregger et al., 2019). This is especially true for sectors that rely primarily on the creative component, such as intellectual services, manufacturing, architecture, electronics, design, consulting, and advertising.

Due to the small size of MSMEs, the benefits from the use of OI seem to be even greater for them compared to the large players (due to the "low start" effect). While the benefits of OI for this category of business entities

[1] https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/how-we-help-clients/Strategic-Growth-and-Innovation, accessed 08.06.2024.

and their implementation in practice are described to a sufficient extent, research on the open model for smaller companies is still scarce (Hinteregger et al., 2019; Cricelli et al., 2015).

Our article fills this gap by examining the opportunities offered by digital platform communications for MSMEs. The ways of increasing their effectiveness in relation to OI are shown, allowing such firms to master more complex business models with expanded opportunities for development. The role of digital platforms in strengthening the link between OI and MSME performance is assessed.

Literature Review

Open Innovation Theory

The concept of OI has many similarities with the theory of resource dependence, according to which organizations need external assets to function successfully (Pfeffer, Salancik, 2003). Partnerships are a critical tool for attracting said assets. Furthermore, the intensity and quality of the latter lay the foundation for innovation performance and a preventive approach in corporate strategies (Fan et al., 2022; Tobiassen, Pettersen, 2018). The quality of communications is improving thanks to digital platforms as a source of additional opportunities for companies to work with external resources in order to generate new ideas, knowledge, and technologies (Hossain, Lassen, 2017; Abbate et al., 2019). Similar processes can become a catalyst for the production of products and services that better meet market needs. Effective control of internal and external ideas depends on how skillfully companies attract them, test, integrate, and convert them into implementable innovative solutions. This is an important part of a successful strategy both in open and closed innovation systems.

There are "inward", "outward", and "combined" types of OI. The first means accumulating developments "from the outside" in order to "implant" them in the internal corporate "organism" (Lichtenthaler, 2009; Bogers, Horst, 2014). The second involves the flow of internally generated ideas and other assets to other parties, while the third involves a combination of incoming and outgoing flows. All of them in one way or another involve the generation of proposals for the creation of new products or the modernization of existing ones, the improvement of business processes, and so on. (Bogers et al., 2017). To this end, alliances are being created to develop new technologies, which include start-ups, mature enterprises, universities, research centers, and proxy agencies (Chesbrough et al., 2014; Perkmann 2015; Schillo, Kinder, 2017).

The Versatility and Ambiguity of the Effects of OI are a Factor of Managerial Complexity

Open innovation is an objectively complex process, characterized by a variety of structures and forms of implementation (Dahlander, Gann, 2010; Huizingh, 2011). The risks, limitations, and opportunities associated with it have been sufficiently studied. To master OI, a certain maturity and readiness to manage complex multidirectional processes with a large degree of uncertainty are required (Cheng, Huizingh, 2014). There are enough publications reflecting the positive impact of OI on business growth (Chiang, Hung, 2010; Lichtenthaler, 2009), R&D efficiency (Chiesa et al., 2009), customer satisfaction (Chesbrough et al., 2011; Wagner, 2010), and overall success of the new product (Rohrbeck et al., 2009). At the same time, there is a lot of evidence of their "other side" that is valuable, and these ambiguous aspects are worth consideration.

According to statistics, the failure rate of OI projects is quite high (Lichtenthaler, 2011). Failure to prepare for an open model usually leads to the leveling of company assets and other discrete effects (Torkkeli et al., 2009). The most common reason is the inability to differentiate between the three above-mentioned types of OI. Particularly high risks arise from the inability to filter external data from partners, clients, competitors, consultants, research institutes, and universities (Faems et al., 2005; Tether, Tajar, 2008) and to create new combinations, combining one's own and attracted assets to increase innovative efficiency.

The concept of OI is based on the idea that in a highly competitive environment, a linear model of innovation (Von Hippel, 1988) is unable to fully explain innovation processes (Bigliardi et al., 2020). As previously noted, to increase competitiveness, companies have to open their "borders" and cooperate with external parties through the exchange of knowledge, technology, and other resources (Galati, Bigliardi, 2017).

The failure of OI projects occurs for many technical and non-technical reasons (Bigliardi et al., 2020). Problems can arise at different levels: strategic (the inability to balance openness and the protection of one's own assets) (Grimaldi et al., 2021), organizational (maturity and readiness of employees) (Natalicchio et al., 2018), operational (process integration) (Gurca et al., 2018), communication (hidden conflicts and destructive rivalry) (Malhotra et al., 2017), and individual (lack of knowledge) (Torres de Oliveira et al., 2021).

The high percentage of failures in OI is explained by the complexity of managing these processes and the uncertainty of their results. The existing literature does not sufficiently capture the nuances of the diversity of

OI aspects. Compared to others, limiting factors such as the lack of a clear vision, limited resources, improper management structure, haphazard innovation, and non-compliance with rules are revealed in comparative detail (Beck et al., 2020; Saura et al., 2022).

The most common problem in implementing OI projects is the lack of funding, which is faced by up to 70% of companies (Torres de Oliveira et al., 2021). Another significant factor is suboptimal resource allocation (Faridian, Neubaum, 2021; Urbinati et al., 2020). Like any complex system, OI requires a properly adjusted dynamic balance of all links, as well as their constant and flexible adjustment (Germonprez et al., 2020). Here, much depends on the focal point's ability to manage decentralized innovation processes involving a wide range of external parties (Gassmann et al., 2010). As the number of parties involved, activities, and technologies increases, more interactions and diversity of information appear. These complex multidimensional processes need proper management and synchronization (Gentile-Lüdecke et al., 2020). The abundance of data can either increase or decrease the effectiveness of OI. Often, due to information overload, participants lose the ability to quickly identify high-quality ideas and potential opportunities that may not initially be perceived as such (Gentile-Lüdecke et al., 2020). In such cognitive failures, it is very difficult to establish a balance between the quality and quantity of the intellectual resources involved, taking into account the specifics of the functioning of different OI platforms (Ovuakporie et al., 2021).

The attempt to manage an excessively multilateral format of cooperation poses a large-scale coordination challenge. The accumulation of intricate, complex flows of knowledge from a variety of sources in many cases causes information overload and entropy. Trying to juggle multiple parallel projects and keep participants motivated (without building the ability to do so) results in a loss of management control. A cognitive "complexity catastrophe" occurs (Kaufmann, 1993), which starts a chain of errors in decision making (Ovuakporie et al., 2021). The problem is solved by installing a kind of "filter" on incoming information flows, based on a clearly defined structure, concept, and understanding of the characteristics of the innovative product being created and needs (Gentile-Lüdecke et al., 2020; Torres de Oliveira et al., 2021; Bogers et al., 2017; Zobel, 2017).

Along with filtering incoming information flows, comprehensive security measures are needed to protect knowledge and new ideas from unauthorized use. The risks of intellectual asset leakage increase as more external participants become involved in the IP process (Bogers et al., 2017; Dahlander et al., 2021). Building and maintaining the right balance between openness and protecting confidential information is often an "unsolvable" task, giving rise to discussions about the "openness paradox" (Bogers et al., 2018; Obradović et al., 2021). This is about internal contradictions of motives between the generation of innovations and their commercialization. The OI approach to new product creation cannot be implemented without a willingness to share knowledge with external partners. However, for commercialization reasons, the development of protective measures is required (the partial concealment of information representing a source of unique competitive advantages) (Capaldo, Petruzzelli, 2011; Niesten, Stefan, 2019). This paradox is present in any processes associated with OI (Laursen, Salter, 2014; Zhong, Sun, 2020).

The next dimension in which the ambiguous properties of OI are manifested is that when co-financing and managing this process, the project team does not need to be "tied" to the strict requirements of specific investors. In a closed model, this complexity does not arise due to the clearly defined rules and standards of one or two investors. However, a wide range of alternative attractive opportunities becomes unavailable. Complex thinking is required to take into account the multitude of interdependencies with its rules, maneuver quickly, and find a balance between reliability and diversity of standards (Abhari et al., 2022; Elia et al., 2020), freedom of action, and ensuring the appropriate quality of results. Special programs for preparing for OI projects significantly reduce the risks of not taking these factors into account.

Correct timing plays a significant role. Errors in its calculation can lead to catastrophic delays at any level. Very often, time estimates for OI projects turn out to be unrealistic due to illusory expectations, which leads to resource depletion and failure (Beck et al., 2020).

A strong collaborative OI community can only be created on the basis of a well-chosen project team that combines a variety of unique abilities, talents, and competencies (Coelho et al., 2016; Forbes et al., 2019). Thus, the difficulty of providing highly qualified personnel appears to be among the most common barriers to the implementation of OI projects, especially in highly specialized sectors (Torres de Oliveira et al., 2021; Cheah et al., 2021; Chaudhary et al., 2022). The lack of robust recruitment and skills assessment procedures hinders the formation of effective project teams (Bertello et al., 2021; Obradović et al., 2021).

Despite these aspects, the success or failure of OI projects often depend not on objective complexity, but on perceived complexity (Stefan et al., 2022).

Thus, a comprehensive understanding of risks and potential problems at an early stage, as well as finding the necessary balances in relation to the paradox of openness, will greatly increase the chances of survival and productivity of OI projects.

Open Innovation and MSME Performance

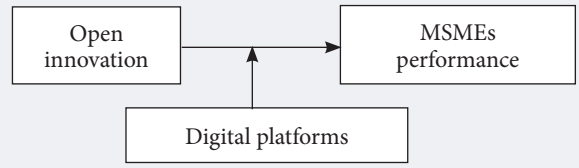
Most publications on OI focus on large and high-tech companies. These works substantiate the positive effects of OI for competitiveness in such aspects as the creation and scaling of innovations, technological superiority, expanding markets, improving organizational management, and so on. (Van De Vrande et al., 2009; Hinteregger et al., 2019; Cheng, Huizingh, 2014). In contrast, the trend of implementing OI at MSMEs is still in its initial stages. Nevertheless, this area is also attracting increased research interest. There is growing evidence that OI is also attractive and relevant to MSMEs, which have some potential to implement this model, but its deployment is hampered by the "size factor" and narrow interests for participation in OI (Cricelli et al., 2015; Hinteregger et al., 2019). Basically, MSMEs resort to OI practices only for market reasons (to increase their client base, to get ahead of competitors, etc.) (Van De Vrande et al., 2009). There is a lack of knowledge among their leaders about how the OI mechanism works and how to extract additional benefits from participation in this process.

Moving beyond a simplistic market orientation and exclusive focus on increasing profits changes a lot. Understanding broader and interconnected social and environmental issues provides the key to developing innovative proposals that can become a unique source for strengthening competitive positions (Linnenluecke, Smith, 2018).

The problem of small business size initially poses a major challenge for MSMEs in terms of attracting external resources, since when trying to build bilateral partnerships with large players, the latter would doubt the maturity and readiness of MSMEs for such complex models as OI.

Thus, the factor of resource dependence for MSMEs initially looks like a more serious barrier than for large players. However, when involved in broad IO networks, where many participants of different sizes are involved, with their own unique sets of resources and competencies, complex flows of exchange of these assets arise between all participants. From such a network, it is much easier for small players to receive the necessary "feed" (they receive more indirectly), whereas in the case of isolated bilateral partnerships such a flow would be problematic.

Figure 1. **Research Framework**



Source: authors.

Involving consumers in the product development process allows us to generate more relevant and useful solutions, strengthen customer relationships, and improve the company's image as an OI-ready player. From the above, the first hypothesis follows:

H1. *OI has a positive impact upon the performance of MSMEs.*

The Intermediary Role of DigitalPplatforms

The skillful use of digital platforms significantly increases the quality of management, focus on consumer demand, and, as a result, overall business performance (West, 2015). Sharing knowledge and new methodologies through digital platforms expands the range of entrepreneurial opportunities for MSMEs (Nambisan, Sawhney, 2007).

MSMEs are initially migrating to digital platforms to survive in an increasingly competitive environment, with the exchange of knowledge and new methodologies on these platforms expanding their entrepreneurial opportunities (Bi et al., 2017; Kontolaimou et al. al., 2017; Frishammar et al., 2018; Viglia et al., 2018). The use of digital platforms is seen as a factor in the "pre-preparation" of MSMEs for participation in OI. Its presence mitigates the potential risks for MSMEs losing their own resource base instead of acquiring additional assets when involved in OI (Ramirez-Portilla et al., 2017).

This leads to the second hypothesis:

H2. *Digital platforms strengthen the link between OI and MSME performance.*

The structure of our study is shown in Figure 1.

Research Context and Methodology

According to World Bank criteria, microenterprises are defined as companies with annual sales of less than 100,000 USD. In turn, small companies include

companies in which this figure is 100,000–300,000 USD, and medium-sized ones — 300,000–500,000 USD (Ebitu et al., 2016).

In Indonesia, MSMEs have significant potential to create new jobs - for 121 million people, a meaningful contribution to the gross domestic product (GDP), growing by 5% annually. MSMEs provide 96.9% of employment, 57.56% of GDP, and 15.68% of exports.[2] According to data for 2019, the number of microenterprises in Yogyakarta amounted to 143,385, small companies - 65,533, medium companies - 39,581, and the number of such enterprises continues to grow.[3] Nationwide, digital platforms were used to market the new products of 3.79 million MSMEs (8% of the total number of national MSMEs, which amounted to 59.2 million).[4]

Data Collection and Sampling

To achieve our research goals, we conducted a questionnaire-based survey among MSMEs in Yogyakarta (Indonesia). The selection of participants was based on criteria such as age, number of employees, and the location of companies. The sample initially included the representatives of 200 enterprises.

The questionnaire consisted of three blocks. The first was devoted to two points of interest – "inward" and "outward". The second concerned the assessment of the performance of MSMEs along four dimensions: financial, non-financial, environmental, and social. The third section, which touched on the usage of digital platforms, also relied on four indicators: internal, outgoing, and incoming communications as well as order formation. Each section of the questionnaire consisted of 10 questions, according to the methodological recommendations of the work (Cenamor et al., 2019). Responses were scored according to five-point Likert scale: from 1 – "strongly disagree" to 5 – "completely agree".

As a result of distributing questionnaires via social networks, 164 responses were received. After filtering, 14 questionnaires were eliminated due to incompleteness or respondents not meeting all the criteria on the basis of which MSMEs are identified. Eventually 150 responses were analyzed. Due to the nature of online surveys, the general number of potential participants remained unknown. Thus, response rates were calculated by dividing completed questionnaires by the number of initial responses received (Fleming and Bowden, 2009). The share of compiled suitable questionnaires amounted to 91%.

Table 1. **Demographic Characteristics of Respondents**

Demographic variable	N	%
Level of education		
Primary – Senior high school	59	88.5
Bachelor	78	117
Master	13	19.5
Business Age		
<10 years	112	168
10-16 years	20	30
>16 years	8	12
Respondent Age		
19-25 years old	27	40.5
26-35 years old	54	81
36-45 years old	36	54
>46 years old	33	49.5
Gender		
Female	50	75
Male	100	150
Demographic variable	n	%
Number of Employee		
<5 employees	96	114
6-10 employees	34	51
>10 employees	20	30
Income level		
10 – 300 million	65	97.5
300 million – 2.5 billion	73	109.5
>2.5 billion	12	18
Business sector		
Advertising	12	12
Automotive	13	2
Architecture	8	5
Craft	9	6
Culinary	43	43
Electronic	22	2
Fashion	20	10
Publisher	6	5
Service	9	9
Photography	8	6

Source: compiled by the authors.

Measurement

Efficiency is assessed by a combination of financial and non-financial factors (Jennings, Beaver, 1997). Our respondents, the MSME owners, assessed their current performance in comparison with their own achievements in the past year and the performance of competitors (increased productivity, sales, and profitability from a new product, increased market opportunities, increased customer satisfaction,

[2] https://www.bi.go.id/id/default.aspx, accessed 18.03.2024.
[3] https://bappeda.jogjaprov.go.id, access date 07.05.2024.
[4] https://satudata.kemenkopukm.go.id/, access date 24.04.2024.

Table 2. **Factor Loadings and Cronbach Alpha Value for Studied Variables**

Dimension	Load	α
Open innovation (Ili et al., 2010; Schroll, Mild, 2011; Bianchi et al., 2010; Cheng, Huizingh, 2014)		
1. Inbound	0.719	0.791
2. Outbound	0.764	
MSMEs performance (Cheng, Huizingh, 2014; Purnomo, 2019; Ketata et al., 2015)		
1. Financial	0.602	0.653
2. Nonfinancial	0.521	
3. Environment performance	0.459	
4. Social performance	0.614	
Digital platform (Cenamor et al., 2019)		
1. Internal communication	0.749	0.920
2. Inbound communication	0.836	
3. Outbound communication	0.720	
4. Order pick up	0.727	
Source: compiled by the authors.		

reduced delivery times, improved business processes, solving the waste problem).[5] Potential digital platforms in terms of the availability of external resources for companies was measured on corresponding scales of information technology functionality (*information technology capability scale)* (Rai, Tang, 2010). It largely depends upon how quickly and dynamically MSMEs develop IT resources, strategic planning, and partnership culture. The question wording in English and Indonesian was synchronized to ensure conceptual consistency, as recommended by (Brislin, 1970).

Results and Discussion

Detailed information on the demographic characteristics of respondents is presented in Table. 1. In terms of gender, their ratio was two to one in favor of men. Most often, respondents fell into the age category of 26–35 years. More than 80% of the companies covered are under 10 years of age. If we talk about the level of education of their owners, then a bachelor's degree prevails (58% of cases). Of these, 45 people were owners of micro-enterprises, 53 of small, and 52 of medium businesses. Before further analysis, the collected data was checked for reliability and validity (Table 2). Excluded items did not meet the threshold (i.e., Cronbach's alpha greater than 0.6 for reliability, r-score correlation value ≥ r-table for reliability) (Hair et al., 2019).

To check the proposed hypotheses, data were analyzed using a linear regression.[6] A significant direct positive relationship was established between OI and MSME performance. A simple regression analysis shows that the OI value is 8.247 ≥ t _ table = t(/2); n – k – 1 = t (0. 005; 98) = 2. 62693, with a significance level of 0.000 ≤ 0. 05, and a regression coefficient of 0.744. Therefore, hypothesis H1 is confirmed. OI improves the performance of MSMEs.

In this study, hypothesis H2, which suggests that digital platforms improve the link between OI and MSME performance, was tested using moderated regression analysis (MRA) to test the role of moderating variables (digital platforms). According to the results of regression analysis, at _ count = 3. 258 is greater than t_table = t (/2; n–k–1 = t(0.005; 98) = 2.62693, with a significance level of 0.002 ≤ 0.05 (moderate). Therefore, the hypothesis H2 is confirmed. The results of the analysis are presented in Table 3.

This study's findings confirm previous observations that it is not just large companies that are improved by OI (Chesbrough et al., 2014; Van De Vrande et al., 2009; Wynarczyk et al., 2013), their effects extend to smaller businesses. By becoming more open to strategic interactions, MSMEs, in co-evolution with other parties, dynamically develop their business, introduce innovations, and increase customer satisfaction. Digital platforms facilitate this process by providing companies

Table 3. **Relationships among focal variables**

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Hypothesis verification results
		Std. Error	Beta				
1	(Constant)	16.092	1.863	0.640	8.640	0.000	Supported (H1)
	Open innovation-MSMEs performance	0.744	0.090		8.247	0.000	
2	(Constant)	42.739	8.281	1.980	5.161	0.000	Supported (H2)
	Digital platform-Open innovation*MSMEs performance	0.035	0.011		3.258	0.002	
Source: compiled by the authors.							

[5] Methodological aspects of assessing incoming and outgoing resource flows in the process of OR are discussed in detail in the works (Schroll, Mild, 2011; Cheng, Huizingh, 2014), and factors for using digital platforms - in the publication (Cenamor et al., 2019).

[6] The IBM SPSS software package (version 26) was used.

with greater communication capabilities, both internally with employees and externally with customers (Li et al., 2016). This simplifies and speeds up transactions, improves service quality, and increases productivity.

Conclusion

Small and medium-sized businesses make a significant contribution to national GDP in both developed and developing countries. MSMEs are a constant focus of research; transformation processes take place here, which can affect a variety of socioeconomic aspects. In recent decades, two new driving forces have emerged that are reconfiguring the business models of all types of companies - open innovation and digital transformation. Identifying the practices of MSMEs using these factors and the resulting effects from their combination was the subject of our study in the Indonesian context.

A natural consequence of the development of any small company is a consistent increase in size. Problems arise when the internal base has been exhausted, and in order to ensure further growth, it is necessary to attract a variety of assets externally. This is a rather complicated process, since "wealthy" players mainly enter into alliances with their own kind. In order for a "newbie" to prove its attractiveness as a partner, it has to spend a long time and great effort building trusting relationships with each major player, proving its worth in terms of competencies, reputation, and other aspects. With the proliferation of digital platforms, this process is becoming easier. Since there are natural flows of information, ideas, knowledge, and other resources between participants, MSMEs can take advantage of them. At the same time, complexity is not eliminated, since in order to practice the OI model, a certain maturity and willingness to flexibly combine a variety of aspects of management are required, taking into account the risks of downsides of OI. There are enough studies that, while noting the creative power and potential of OI, at the same time they reveal the "pitfalls" associated with open innovation practices. Openness requires new thinking and behaviors, finding an optimal balance between protecting one's own intellectual assets and being receptive to external knowledge flows. Companies that are not prepared for OI risk end up in the "outgoing" OI pattern, that is, losing their sources of competitive advantage and slipping into an extremely negative scenario.

Our study enriches the knowledge and empirical base on the creative impact of open innovation on MSMEs, and the empowering effects of digital platforms (Lee et al., 2009; Bianchi et al., 2010; Hinteregger et al. al., 2019). OI provides access to knowledge, technologies, and other resources of external origin, it helps build new competencies and competitiveness, improve the quality of products and services, and helps internal potential grow. Digital platforms encourage MSME owners to take a more flexible and creative approach to business development, to study the intricacies of the co-evolution phenomenon, which allows them to reach an exponential pace of development.

The limitations of this study relate to the representation of the experience of a single local region. It would be advisable to expand it to other countries and increase the representativeness of the samples. If one takes into account that digital platforms themselves are rapidly changing and becoming more complex, their functionality is expanding, then subsequent research may reveal unexpected phenomena in this direction.

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