

The Effect of Networking Behavior on the Reduction of Innovation Obstacles to Small and Medium-Sized Enterprises

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DOI: 10.6007/IJARBSS/v5-i3/1529 URL: <http://dx.doi.org/10.6007/IJARBSS/v5-i3/1529>

Abstract

Given the crucial importance of small and medium-sized enterprises (SMEs) in the business world, it is important to study the factors which enhance their effect, including networking behaviours and innovation. Many researches have focused on business networks and innovation, but a lack of interdisciplinary studies is felt. Using questionnaires to collect data, and correlation and regression testing, this paper studies the relationship between networking behaviour and the reduction of innovation obstacles within SMEs. The role of the variables in question has been studied among 118 managers of SMEs established in Tehran University's Science and Technology Park. The results of the study show that there is a significant relationship between networking behaviour and the reduction of innovation obstacles. The most effective parameter of networking behaviour is 'maintaining contacts'. 'Using contacts' and 'building contacts' are in the second and third place, respectively.

Keywords: Networking behaviour, Networks, Innovation, Innovation obstacles, Small and medium-sized enterprises

Introduction

A network can be defined as a specific set of bonds within a determined set of role players (Groen, 2005). In other words, a network is a context in which enterprises take place, including different business relations and interactions (Jamsa et al., 2011). Scientific research on networking dates back to the 1980s. The researches in this field can be classified in two groups. The first group focuses on power and politics and generally argue that organizations are political institutions in which informal processes affect career paths. The second group of researches is concerned with careers. In this category of researches, networking is defined as 'Individuals' attempts to develop and maintain relationships with others who have the potential to assist them in their work or career'. Thus, both groups of research define networking as a personal phenomenon focusing on behaviour (Wolff; Kim, 2012).

Discussing innovation, we have to note that the term is not homogeneous. Each author defines it in a new way, emphasizing the most relevant parameters in their opinion. The definitions of innovation are generally subjective, and not objective (Matlay et al., 2011). Innovation as a multiple process (Chetty; Stangl, 2010) necessarily signifies newness and doing new and different things (Madrid-Guijarro et al., 2009; Rogers, 2003). 'Newness', however, does not necessarily refer to new knowledge, but can also mean progress or reform in existing knowledge (Tiwari, 2007). During the recent decades, the literature on innovation and entrepreneurship has undergone considerable changes and has significantly developed. It has given a crucial importance to firm learning, copying, training and networking (Laforet; Tann, 2006). In the past twenty years, the appearance, the nature, and the management of innovation have been popular subjects in academic research (Chetty; Stangl, 2010). Research on innovation in SMEs is centred on entrepreneurship and innovation, promoting innovation, market types, management and mismanagement of innovation in SMEs (Laforet; Tann, 2006).

Although the benefit of networks to the development and distribution of innovation is well-known, there is still a need for more research on how networking can have an effect on the development and distribution of different types of innovation (e.g. product or innovation, and organizational innovation) (Pittaway et al., 2004b). Based on the researches undertaken in this domain, we can consider networking as the motivator for innovation in firms. Nevertheless, the extent to which it can be effective on innovation and obstacles to innovation, how it can affect innovative performance in SMEs, or how it directly impacts new product development is still ambiguous. (Laforet, 2011).

Previous researches have more tended to highlight the priority and importance of different forms of innovation obstacles in SMEs (e.g. Segarra-Blasco et al., 2008; Madrid-Guijarro et al., 2009) or to study product innovation and related subjects (e.g. Hadjimanolis, 1999) than to focus on the factors which reduce these obstacles. Nevertheless, these factors can incentivize innovation in enterprises. Based on theoretical principles, this paper considers networking as a factor reducing innovation obstacles and tends to study its effect. Given the extent of the meanings attributed to networking and innovation, and in order to focus better on the subject, we have classified networking behaviour to three parameters, namely, building, maintaining, and using contacts. As for innovation, reducing innovation obstacles encountered by SMEs is focused on, and our research question is "Does networking behaviour exert reduction effect on the innovation obstacles to SMEs"?

After reviewing theoretical principles of networking behaviour and innovation, we will go through the history of research in these fields. Then, we will define the research questions and present our research methods and the results of data analysis.

Literature review

Networks and networking

Networks and networking have various definitions in the entrepreneurship literature. Networks are introduced by their nature (Jamsa et al., 2011). Antecedent of research on networks as an important new area of inquiry within the field of entrepreneurship, goes back to about 15 years ago (Hoang; Antoncic, 2003). As mentioned before, a network is a context in which business

takes place. Some believe that networks are a kind of strategy aiming at making alliances through people who can help the business develop. A network can also be considered a tool used by entrepreneurs to preserve competitive advantage (Harding, 2000). For example, to exploit new technologies in networks, many small firms go farther and extend the scope of their relations to include other small or large organizations. This is known as entrepreneurial networking (Groen, 2005). Moreover, networks are regarded as individual relationships between SMEs' managers or owners and internal or external entrepreneurs. They are also viewed as long-term relations between SMEs' managers or owners and external role-players (individuals or organizations). Information, support and other resources are obtained through the latter (Thrikawala, 2011). Groen regards networking as a personal but also collective behaviour. He defines personal networking as the management of relations or alliances between individuals in society. Networking in the context of a small firm can be defined as activities in which the SMEs' owner entrepreneurially aims at creating and managing personal relations with specific people present in their environment (Groen, 2005).

Wolff and others view networking as a behavioural syndrome consisting of a series of interrelated and continual behaviours of people (Wolff et al., 2011). Wolff and Moser regard networking behaviour as having an internal and an external dimension, each classified to three parameters, namely creating, maintaining and using contacts (Wolff; Moser, 2006). These parameters are defined below (conceptual definition):

- **Building contacts:** includes behaviours which consist of starting and creating new bonds. This is a highly social activity, therefore social skills play an important role in it.
- **Maintaining contacts:** includes socializing information exchange (what the others are doing or the latest gossip or information.) Mediators have a crucial role in maintaining contacts.
- **Using contacts:** implies using contacts as a tool. While respecting social norms, people sometimes need specific resources. Therefore, they express their need in the hope of attracting support (Wolff; Moser, 2006; Wolff; Kim, 2012).

SMEs have strengths and weaknesses. Thus, they are inclined toward networks and networking so as to cover their deficiencies. Even though SMEs are very dynamic, they severely face threats of insufficient investment and resources. Both financial and non-financial aspects of SMEs may have irrelevant organizational characteristics. For instance, lack of applied expertise, lack of focus on risks, insufficiency of information to identify market opportunities and non-economic scale. To overcome these obstacles, enterprises have to depend on collaboration with other organizations. This means that they have to create strategic business networks (Kolakovic et al., 2009). According to Pittaway and others, the advantages of networking include sharing the risk, providing access to new markets and technologies, speeding products to market, pooling complementary skills, preserving proprietary rights when contracts are not thoroughly or conditionally feasible, and acting as a key factor in obtaining external knowledge (Pittaway et al., 2004b). Through this process and by obtaining competencies, creating resources, sharing risks, accepting fast market movements, and creating joint ventures, SMEs can solve some of

the aforementioned problems and acquire competitive advantage by allocating limited resources to more relevant activities (Kolakovic et al., 2009).

Innovation

The word innovation is derived from the Latin 'innovare' which means 'to renovate things' (Tidd et al., 2001). In the three past decades, the meaning of the word 'innovation' has changed from its initial sense, i.e. 'a process of or a prelude to change', to a modern and standard signification including concepts such as creativity, success, profitability, and client satisfaction. This has been widely reflected in the corresponding literature. To this day, innovation has been broadly defined as the development and implementation of new ideas by people for commercial purpose and as 'a sequenced set of (managed) activities' (Hotho; Champion, 2011). The oldest acknowledged definition of innovation used in research to the present day may be attributed to Schumpeter. He sees the significance of innovation in the long-term profit it leads to. In this sense, he views innovation as the process of 'creative destruction'. According to him, innovation leads to competitive advantage by forbidding equilibrium. This is done by destroying enterprises and business models (Schumpeter, 1939). This has led some researches to relate 'entrepreneurship' to 'innovation'. Thus, an entrepreneur is necessarily a 'creative innovator' (Matlay; Martin, 2009; Matlay et al., 2011). Coad and Rao (2007) state that 'entrepreneurial innovation', i.e. increase of useful business knowledge, can significantly help the development of firms and their competitive strategies (as cited in Demirbas et al., 2011).

Drucker considers continued innovation a tool in the hands of entrepreneurs. This means that entrepreneurs can exploit change as an opportunity to do business or to offer services and this leads them to learn and gain experience (Drucker, 1985). Drucker's definition shows that innovation is a key challenge to entrepreneurs and SMEs (Tidd et al., 2001). Drucker has also highlighted the importance of innovation from another viewpoint. For managers and owners who seek to win and sustain competitive advantage, and to increase wealth generating resources, he states, innovation indicates investment in the creation of personal and public wealth (Drucker, 1994). Porter defines innovation through the concept of 'newness'. He believes that firms achieve competitive advantage by their innovative activities and that their approach to innovation includes in the broadest case both new technologies and new methods of doing things (Porter, 1990).

In recent years, the sources of information concerning practical research on firm innovation have been broadened. From early 1950s on, two major measures have been taken by international organizations. In 1992, a statistical project on the nature and measurement of innovative activities was undertaken by the Organization for Economic Co-operation and Development. The results of the project are published as the Oslo Manual, which introduced a new viewpoint on innovation. Its latest edition covers not only product and process innovation but also the role of organizational innovation and marketing. Besides, based on the information obtained from the Oslo Manual, some European countries designed a common survey on firms' innovative activities, known as the Community Innovation Survey¹ (CIS) (Segarra-Blasco et al., 2008).

According to the Community Innovation Survey, innovation means considerable changes aiming at increasing competitive opportunities, functionality, technical knowledge, or potential for future advances (CIS, 2010). This definition (cf. CIS, 2010) has been used in the present study.

Innovation obstacles

Notwithstanding, we should not only point out the positive effects and consequences of innovation. Innovation can put firms in higher risks by facing them with internal factors (such as financial and human resources) and external ones (such as external environment). The negative effect of the probable risk can be a significant obstacle to innovation in firms (Borgelt; Falk, 2007). This is the reason why not all innovative projects are worthwhile. Internal obstacles to innovation can thus be considered organizational sieves separating the worthwhile innovation projects from the unbecoming ones. Such obstacles may even result in the enhancement of the innovative performance of enterprises. This shows that innovation obstacles should be considered as factors which impact, hinder, or delay the innovation process or change innovative ideas and projects in enterprises. These obstacles generally concern the management, organization, and competency of the firm (Hözl; Janger, 2012).

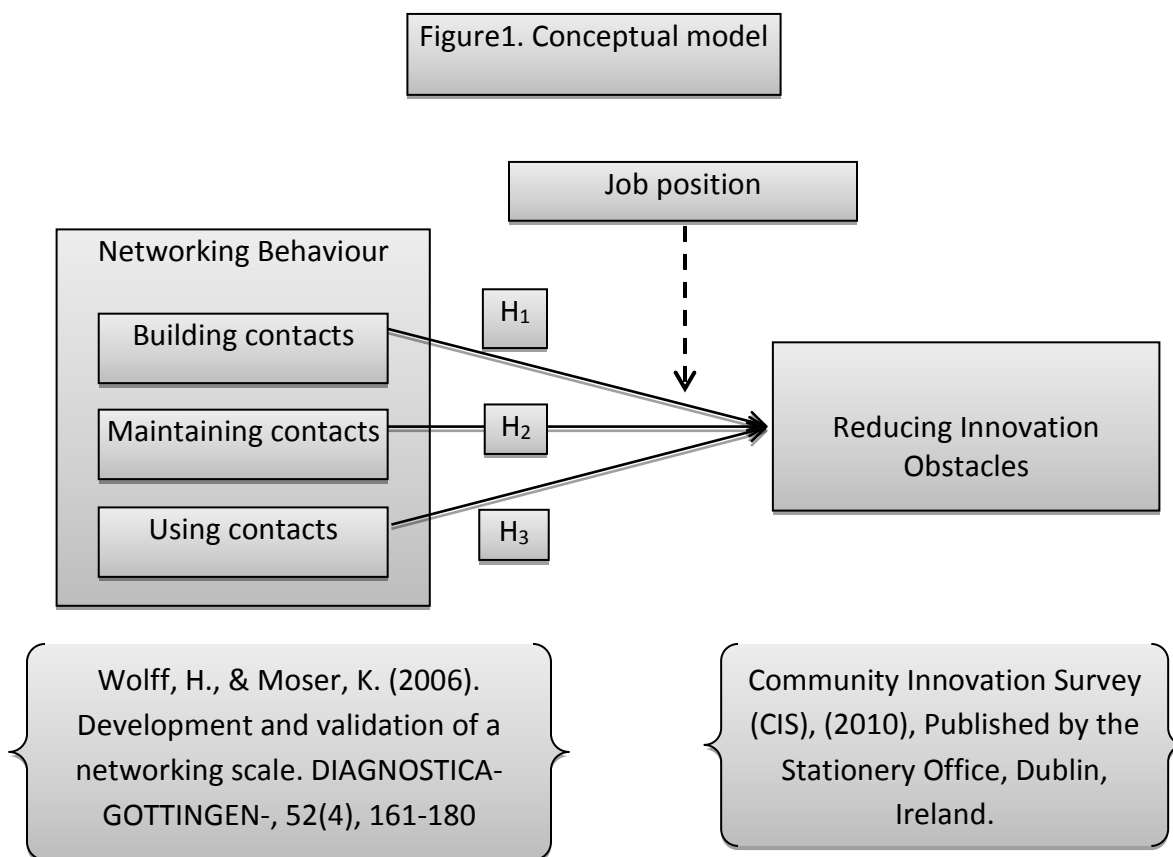
A better understanding of innovation obstacles can help the supporting environment of innovation to grow and develop. That is why it is important to study innovation obstacles in SMEs (Hadjimanolis, 1999). Existing studies of innovation can be classified in two categories. The first category includes researches on innovation drivers or resources. The researches of the second category study the obstacles' approach, i.e. which factors act more as an obstacle than a driver (Hadjimanolis, 2003). At the firm level, obstacles may appear internally, for example due to organizational habits, or externally, e.g. caused by market, government, or system failure. We have to note that innovation obstacles may sometimes act as innovation drivers. For instance, external obstacles such as the lack of necessary skills to realize innovation projects can act, on the other hand, as a driver for innovation, e.g. the need to train skilled workforce (Hözl; Janger, 2012).

Obstacles can be classified in different ways. Most researches classify them into internal and external obstacles (e.g. Hadjimanolis, 1999, 2003; Madrid-Guijarro et al., 2009; Segarra-Blasco et al., 2008). In this paper, we will only give a general explanation of this classification and will not go into details. Internal obstacles stem from the inside of the firm, while external obstacles come from the external environment. D'Este and others think about innovation obstacles differently. They claim that it is necessary to distinguish between two main barriers to innovation: 'revealed obstacles' (refers to the firm's awareness of the innovation difficulties and points to learning outcome) and 'detering obstacles' (assumes as unconquerable obstacles by firms) (D'Este et al., 2012). The Community Innovation Survey goes farther in its classification which will be discussed. To measure innovation obstacles, the 2010 CIS questionnaire has been used. Innovation obstacles (based on the parameters used in the questionnaire) are classified as the following (conceptual definition):

- Cost-related innovation obstacles: include lack of internal or external investment and high innovation costs that definitely cause some problem with innovation and innovative project.

- Knowledge-related innovation obstacles: include lack of skilled workforce, lack of technological information, lack of information about market, difficulty finding associates for collaborating in innovation which may cause some trouble in applying innovation.
- Market-related innovation obstacles: include domination of well-established firms and uncertain demand for innovative products and services which hamper other firm to pursue innovative (CIS, 2010).

Based on the theoretical principles discussed, the model used in this study has two research structures, namely networking behaviour and factors reducing innovation obstacles. To define and evaluate the networking behaviour structure and innovation obstacles, Wolff and Moser (2006)'s and CIS (2010)'s definition and questionnaire were used, respectively. Figure 1 gives the following conceptual framework.



So we hypothesize the following:

- The main hypothesis: There is a significant relationship between networking behaviour and reducing the innovation obstacles to SMEs established in Tehran University's Science and Technology Park.
- Peripheral hypotheses:

- 1) There is a significant relationship between building contacts and reducing the innovation obstacles to SMEs established in Tehran University's Science and Technology Park (first hypothesis).
- 2) There is a significant relationship between maintaining contacts and reducing the innovation obstacles SMEs established in Tehran University's Science and Technology Park (second hypothesis).
- 3) There is a significant relationship between using contacts and reducing the innovation obstacles to SMEs established in Tehran University's Science and Technology Park (third hypothesis).

Method

Sampling and procedure

Sampling was done using the simple random method. The statistical population includes 203 SMEs established in Tehran University's Science and Technology Park which their staffs are given the questionnaire. The questionnaires collected face-to-face with the participants. We obtained 148 complete questionnaires for a response rate of 73 percent, and selected only respondents who had had managerial position (wolf et al., 2008), for a final sample size of n=118. The measuring tool was standard questionnaires, as previously mentioned. Even though the questionnaire was standard, expert advice from six university lecturers was used to confirm its validity. The Cronbach's alpha test was used to determine the questionnaire's reliability. The results of this test are presented in Table 1. The total Cronbach's alpha of the questionnaire is 0.89 which is acceptable.

Building Contacts	0.86
Maintaining Contacts	0.85
Using Contacts	0.87
Reducing the Innovation Obstacles	0.83

Measures and Analyses

Networking behaviour (independent variable). We assessed networking using Wolff and Moser's (2006) networking scales and due to the SMEs established in Tehran University's Science and Technology Park have been defined as the statistical population, this research only studies the external dimension and they earned a value from 1 to 5. They were expressed as the following (operational definition):

- Building external contact: Do respondents have tendency to create external contact?
- Maintaining external contact: Are participants keen to keep in touch with other member of network?
- Using external contact: Do respondents try to exploit the current communication?

Innovation obstacles (dependent variable). We used the questionnaire of the Community Innovation Survey (2010) to evaluate innovation obstacle and they gained a value from 1 to 5. They were mentioned as the following (operational definition):

- Cost-related innovation obstacles: To what extent do financial matters hamper innovation and innovative projects? And how far can this hurdle be facilitated using networking behaviour?
- Knowledge-related innovation obstacles: What are the role of lack of knowledge and skill in their innovation? And how far can this hurdle be facilitated using networking behaviour?
- Market-related innovation obstacles: To what extent do giant businesses impede innovation and innovative projects? And how far networking behaviour can smooth this obstruction away?

Control variable. We used one control variable in our analyses and controlled for respondents' managerial position (1=Non managerial, 2= Managerial).

The present study is an applied research project with descriptive data gathering. It evaluates the effect of a variable on another variable. It can thus be classified as a correlation project. Pearson correlation coefficient was also used for to study the relationships between variables. To prioritize the networking parameters by the prediction of effectiveness on the reduction of innovation obstacles, stepwise regression analysis has been used. Correlation and regression calculations have been done using SPSS.

Results

Data analysis and hypothesis testing is based on data obtained from 118 questionnaires filled by the managers of SMEs established in Tehran University's Science and Technology Park. 21 percent of the participants were women and 79 percent of them were men.

Table 2 shows the matrix of coefficients for the correlation between networking behaviour and reducing innovation obstacles.

Table 2. The matrix of coefficients for correlation between networking behaviour and reducing innovation obstacles					
	Building Contacts	Maintaining Contacts	Using Contacts	Networking Behavior	Reducing the Innovation Obstacles
Building Contacts	-				
Maintaining Contacts	0.439	-			
Using Contacts	0.407	0.315	-		
Networking Behavior	0.870	0.829	0.877	-	
Reducing the Innovation Obstacles	*0.675	*0.723	*0.704	*0.814	-
(*)Correlation is significance at the 0.05 level.					

As we can observe, there is a positive relationship between networking behaviour and the reduction of innovation obstacles ($r=0.814$). This proves the main hypothesis of the study. In other words, as networking behaviour increases, innovation obstacles to SMEs in Tehran University’s Science and Technology Park are reduced. Based on other results, we can observe that there is a positive and significant relationship between building contacts and the reduction of innovation obstacles ($r=0.675$). The first hypothesis is thus proved. There is also a positive and significant relationship between maintaining contacts and the reduction of innovation obstacles ($r=0.723$), which proves the second hypothesis. Finally, there is a positive and significant relationship between using contacts and the reduction of innovation obstacles ($r=0.704$). The third hypothesis is therefore proved as well.

Then, the stepwise regression testing method was used on networking behaviour and the reduction of innovation obstacles. The results of this test are shown in Table 3. In stepwise regression testing, the entry order of predictor variables (here, the parameters of networking behaviour) was a function of their correlation coefficient. To put it more simply, if the variables satisfy the condition to enter the test, they have been included in the analysis. Otherwise, they have been excluded. In the first step of regression testing, as the predictor variable of ‘maintaining contacts’ entered, the correlation coefficient reached 0.723. In the second step, as the predictor variable of ‘using contacts’ was added, the correlation coefficient increased by 0.069 and reached 0.792. In the third and final step, the predictor variable of ‘building contacts’ was added and the correlation coefficient increased by 0.022 and reached 0.814. In total, the

three variables can predict 66.4 percent of the variance of the ‘reduction of innovation obstacles’ variable. 53.6 percent of this is related to the ‘maintaining contacts’ variable, 9.2 percent related to ‘using contacts’, and 3.6 percent related to ‘building contacts’. Other results of stepwise regression testing are presented in Table 3.

Step	Variable Entered	R	R Square	Adjusted R Square	Std. Error of Estimate
1	Maintaining Contacts	0.723	0.536	0.532	0.3996
2	Using Contacts	0.792	0.628	0.622	0.359
3	Building Contacts	0.814	0.664	0.655	0.343

In Table 4, the validity of stepwise regression analysis for predicting the ‘reduction of innovation obstacles’ variable by analysis of variance is confirmed ($P < 0.000$; $F = 75.026$).

	Sum of Squares	df	Mean Square	F	Sig.
Regression	26.476	3	8.825	75.026	0.000
Residual	13.410	114	0.118	-	-
Total	39.887	117	-	-	-

In Table 5, beta coefficients for predictor variables of the reduction of innovation obstacles are shown.

Table 5. Coefficients of stepwise regression analysis for predicting 'reduction of innovation obstacles' variable					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.231	0.195		1.184	0.239
Maintaining Contacts	0.384	0.083	0.363	4.651	0.000
Using Contacts	0.255	0.062	0.309	4.084	0.000
Building Contacts	0.269	0.077	0.263	3.483	0.001

In the third step of the stepwise regression analysis, predictor variables have entered the regression equation in the following order: maintaining contacts, using contacts, building contacts. The standard beta coefficient for these variables is 0.263, 0.309, and 0.363, respectively.

Discussion and conclusion

As mentioned earlier, the main goal of this research is to study the relationship between networking behaviour and the reduction of innovation obstacles. There is a significant relationship between networking behaviour and the reduction of innovation obstacles. This relationship is direct and, given its correlation coefficient, can be considered strong. In the peripheral part of the research, the relationship between the three parameters of networking behaviour according to Wolff and Moser (2006), and the reduction of innovation obstacles is analysed. Analysis of data obtained from the questionnaires proves all the three hypotheses. The results of regression analysis prioritizes the networking parameters by their effectiveness. Maintaining contacts is the most effective parameter. Using contacts and building contacts are in the second and third place, respectively.

We can therefore conclude that, on their way to innovation, the SMEs established in Tehran University's Science and Technology Park, need to overcome the obstacles including market-related, knowledge-related, and cost-related obstacles. This can be done by networking and benefiting from networks' advantages. Watson (2007) explains this differently. According to him, the relation between networking and the development of firms, which he regards as a result of sustainable innovation, is positive (Watson, 2007). Moller and others have also

concluded that SMEs need a series of network relations corresponding to different innovation forms (Moller et al., 2005). We showed that SMEs can preserve their competitive advantages and proceed to their innovate planning by using networks. Thus we corroborated Harding (2000)'s statement about networks. But unlike Harding, our research domain was not limited to manufacturing firms. These statements can confirm the results of this research.

In this paper, the external dimension of networking has been focused on. It is recommended that in future researches, a relevant statistical population be chosen to cover the internal dimension as well. The relationship between different innovation types (farther than product innovation which is the subject of most studies) and concepts such as network and networking can also be analysed in future research. Prioritization of the parameters of networking behaviour by their effectiveness can be done for each type of innovation separately.

Notes

1. The CIS is a quadrennial survey done by the members of European Union in order to measure innovation progress.

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