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Technology Orientation, Dynamic Capabilities and SMEs Performance

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Abstract

To deal with these fast changing business environments that characterise emerging economies and to seize the opportunities that these environments opens up, any size firms and especially SMEs, must develop their dynamic capabilities to achieve sustained competitive advantages. This study investigates the role of a technology orientation on firm performance, by exploring the relationship between technology orientation [TO], different dynamic capabilities and performance. This study uses survey data from a random sample of 154 small to medium-sized enterprises (SMEs) located in Science Parks in Iran. The findings support the hypothesis that a firm's technology orientation associates with performance and also a firm's dynamic capabilities positively mediate the relationship between technology orientation and firm performance. The results show that among three different types of dynamic capabilities, learning capability most effectively mediates the impact of technology orientation on performance.

Keywords: Technology orientation, dynamic capabilities, performance, SMEs

Introduction

In recent years, strategic orientation has received increasing interest from scholars due to its important role in organisational performance. However, many companies have achieved superior performance by following a technology orientation (Gatignon and Xuereb, 1997; Zhou et al., 2005, Li, 2005, Chen et al., 2014).

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This calls for more research into the various dimensions and types of strategic orientation (Gao et al., 2007; Yarahmadi, 2015). In rapidly changing markets, firms may achieve sustainable competitive advantage through organizational and technological capabilities that enable them to monitor market changes and create, define, discover, and exploit new opportunities, which match the requirements of the environment, ahead of their competitors (Jantunen et al., 2005; Zahra et al., 2006).Technology orientation is a key organisational capability in creating new products (Salavou, 2005),and dynamic capabilities have been proposed as a strategy to build, integrate and reconfigure resources in a fast-changing environment (Teece et al., 1997).Therefore, a combination of technological behaviours and dynamic capabilities constitutes a potential source of competitive advantage in SMEs, especially in highly volatile environments (Yarahmadi et al., 2015).

Based on a cross-sectional research design a postal questionnaire survey was used to collect data from a random sample of 154 SMEs in Iran. Then, a path analysis model was applied to examine the influence of technology orientation on performance and the mediating role of different dynamic capabilities on the technology orientation-performance relationship. Empirical results indicate that technology orientation and dynamic capabilities have an effect on firm performance. Moreover, the important role of technology orientation was addressed because of its postulated direct effects on performance and also its indirect effect through the mediation of different dynamic capabilities.

Our study investigates the effect of technology orientation (TO) on firm performance and the mediating role of dynamic capabilities on the relationship between these two constructs; its aim is to bring clarity to the notion of technology orientation and dynamic capabilities and their potential and realized relationships in the performance of SMEs in Science and Technology Parks of Iran. Salavou (2005) noted the need to examine factors influencing the relationship between technology orientation and performance. Our article contributes to the literature by exploring the mediating effect of the engagement of different dynamic capabilities in this relationship. Assuming the centrality of knowledge to technology orientation and dynamic capabilities, this study enquires into the influence of different types of dynamic capabilities in connection to technology orientation and firm performance. Our article builds mainly on the dynamic capability view of the firm using the approach of Teece et al. (1997).

Given the evidence that technology orientation is beneficial to SMEs, this article investigates the potential effects of this organizational capability by exploring the effect of that on firm performance and the mediating influence of dynamic capabilities engagement on the relationship between technology orientation and performance.

Extending prior studies, this article adopts a disaggregated view of strategic orientations to examine the role of technology orientations on firm performance, and investigates how dynamic capabilities engagements effect the relationship between technology orientation and performance. Dynamic capabilities can be considered as a process to build, integrate and reconfigure internal and external resources to deal with market change (Eisenhardt and Martin, 2000). Based on Teece's et al. (1997) approach, dynamic capabilities can be characterized as a firm's capabilities for integration, learning and reconfiguration of internal and external competence and resources. We consider how three important dimensions of dynamic capabilities, including integration, learning and reconfiguration capabilities, mediate the effect of technology orientation on SMEs performance.

Drawing on strategic orientation theory (Jaworski and Kohli, 1993; Narver and Slater, 1990; Slater and Narver, 1994) and the dynamic capabilities view (DCV) of the firm (Teece et al., 1997), our major contributions are as follows. First, we identify technology orientation as a strategic resource, in the SME context, by identification of the direct effect of technology orientation on performance and the development of dynamic capabilities. Second, we support the development of a broader model of dynamic capabilities in the SME context by investigation of the effectiveness of the mediating effect of dynamic capabilities on improving performance with respect to different dynamic capabilities. In summary, it is suggested that SMEs can improve their performance, when dynamic capabilities media technology orientation.

In pursuance of these objectives, this paper is organized as follows. In the next section, we present some theoretical background; and, based on a review of the relevant literature, related hypotheses are developed. This is followed by a discussion of the research methodology, including the sample, the measures, and the analysis, followed by a presentation of the empirical results from the research. Finally, the article ends with a discussion of the findings of the article and the drawing of some academic and practical implications, limitations, and future research directions.

2. Theory and hypothesis

2.1 Technology orientation

A business strategy can be described as how a firm decides to compete in the marketplace and achieve sustained competitive advantages in an industry (Walker and Ruekert, 1987, Karami, 2012). Strategic orientations can be defined as the principles that lead and affect the firm's activities in interaction with the market through a set of values and beliefs that create essential and proper behaviours for prolonged superior performance (Gatignon and Xuereb, 1997; Yarahmadi et al., 2015).Different studies have developed their own orientation constructs.

Zhou et al. (2005) focused on market, technology, and entrepreneurial orientations as three important types of strategic orientation. Some studies investigated combinations of these orientations. For instance, Bhuian et al. (2005) explored the effect of the combination of customer and entrepreneurial orientations, while Hakala and Kohtamäki (2011) used the combination of customer, technology and entrepreneurial orientations simultaneously. There are also studies that concentrate only on one aspect of strategic orientation. For example, Jantunen et al. (2005) consider a firm's entrepreneurial orientation in investigating international performance.

However, the status of technology orientation as one of the most important aspect of strategic orientations is still somewhat fragmented (Hakala and Kohtamäki, 2011). The concept of technology orientation has been investigated from both individual (e.g., Salavou, 2005; Hakala and Kohtamäki, 2011) and corporate perspectives (e.g., Zhou et al., 2005; Zhou and Li, 2007; Yarahmadi et al., 2015).To date, the role and contribution of technology orientation in SMEs remains to some extent under-theorized as the literature mainly focuses upon large companies (Salavou, 2005; Hakala and Kohtamäki, 2011).Following Gatignon and Xuereb (1997), our study takes a view of technology orientation as one of the most important types of strategic orientations. It has been suggested by Gatignon and Xuereb (1997) that the long term success of a firm depends on the technology orientation that guides its attempts to create new technological solutions, products and services. There is no universally accepted definition of technology orientation.

As has been noted by Gatignon and Xuereb (1997) technology orientation reflects a firm's philosophy of how to apply and develop new technologies or products to interact with the market, through actively developing and incorporating new technology in its products. Therefore, technology orientation guides the firm's attempt to achieve a technological capability superior to that of their competitors (Hakala and Kohtamäki, 2011).Based on a technology orientation concept that reflects the philosophy of "technological push," consumers prefer to choose and use products and services which are technologically superior (Zhou and Li, 2007). To deal with these rapid changes in new technologies, firms need to update their technological base to improve competitive advantage through new product development and innovation. Therefore, technology orientation can be considered as a crucial strategic orientation for a firm's success (Zhou and Li, 2007).For that reason, we include technology orientation in our study to examine its impacts on firm performance.

According to the philosophy of technology orientation, a technology-oriented firm fundamentally is proactive in R & D, acquiring new technologies and using the latest technology in its new products (Gatignonand Xuereb, 1997; Zhou et al., 2005; Voss and Voss, 2000).

As a consequence, it can be suggested that a technology-orientated firm is the firm "with the ability and will to acquire a substantial technological background and use it in the development of new products" (Gatignon and Xuereb, 1997, p. 78). Therefore, it excels in the technical proficiency and flexibility that are essential to cope with highly competitive technological environments (Workman, 1993).As has been argued by Denrell et al. (2003) and Karami (2012) the success of a firm in recognizing strategic opportunities or options depends on its flexibility. Aragón-Sánchez and Sanchez Marin (2005) suggested that technological development and innovation level guide the firm to achieve competitive advantages through the creation of a set of basic elements for success.

Hurley and Hult (1998) argued that a technology-orientated firm fundamentally tolerates and encourages new ideas and has a propensity to adopt new technologies in order to develop new products and services. Therefore, it can be suggested that, in a technology-oriented firm, creativity and invention have been established as the dominant organizational behaviours and principles that guide its activities and strategies (Li, 2005; Zhou et al., 2005). Previous studies (Cooper, 1994; Song and Parry, 1997) argued that the technology capability has an important role in new product development.

Consequently, as noted by Hamel and Prahalad (1994) a technology-oriented firm can achieve a competitive advantage through its leadership in technology and through offering differentiated products, which help the firm to improve its performance. Additionally, Gatignon and Xuereb (1997) and Voss and Voss (2000) argue that a high level of technology orientation leads the firm to be more innovative and develop technologically superior products compared to those offered by competitors, and to achieve superior performance. In addition, to cope with high levels of technological turbulence, firms must allocate more resources to technology development, experiment with the acquisition and application of the latest technologies, and manage uncertainty by innovations (Srinivasan et al., 2002).

For these reasons, we predict that:

H1: there is a positive relationship between technology orientation and firm performance

2.2 Dynamic capabilities and firm performance

The notion of dynamic capabilities has been widely under researched in previous studies (e.g. Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Teece, 2007; Helfat et al., 2007; Makkonen et al., 2014; Cohen and Olsen, 2015; Yarahmadi et al., 2015). However, there is nogenerally accepted and comprehensive definition of dynamic capabilities (Protogerou et al., 2012).

It has been noted by Zollo and winter (2002) that for a better understanding regarding the role of dynamic capabilities in the firm, it is crucial to distinguish dynamic capabilities from operational capabilities. Operational capabilities can be described as a firm's capabilities that enable it to perform its day-to-day operational activities (Teece, 2007), while "dynamic capabilities are those that enable a firm to constantly renew its operational capabilities and therefore achieve long-term competitive advantage" (Protogerou et al., 2012, p.617).

Therefore, according to Teece et al. (1997) the concept of dynamic capabilities can be defined as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (p. 516) that create long-run competitive success for the firm. Accordingly, dynamic capabilities can be considered as a dynamic process that purposefully and systematically create, acquire, integrate or modify the operational capabilities (Eisenhardt and Martin, 2000).Dynamic capabilities can be described as the organizational and managerial processes and procedures that enable firms to achieve sustain superior performance over time (Wilden et al., 2013).Dynamic capabilities lead the firm to explore new opportunities in future markets. According to dynamic capabilities literature "there is a focus on the latent rules and mechanisms that facilitates the creation of new distinctive and difficult to imitate advantages" (Borch and Madsen, 2007, p.113).

Considering the approach of Teece et al. (1997), this paper distinguishes three dimensions of dynamic capabilities: dynamic integrating/coordinating, dynamic learning and dynamic reconfiguration capability. Integration capability isthe firm's ability to assess the resources it possesses and integrate them to create and develop new competences (Amit and Schoemaker, 1993).As noted by Cohen and Levinthal (1990) learning capability can be conceived of as an organizational operation to create competitive advantages through dynamic and multi-level learning processes based on experimentation and repetition. Based on the extended definition of dynamic capabilities proposed by Amit and Schoemaker (1993) reconfiguration capabilities refer to the firm's capability to reconstruct or transform existing resources in order to meet the environmental requirements of a fast-changing business environment.

Although the relationship between strategic orientations, dynamic capabilities and firm performance is well researched, and usually links strategy orientations to firm performance through dynamic capabilities engagement (Zhou et al., 2005; Voss and Voss 2000), little empirical research has investigated the mediating effect of different type of dynamic capabilities on the strategic orientation-performance relationship (Lumpkin and Dess, 1996,;Jantunen et al., 2005).As highlighted by Wu (2007), dynamic capabilities can positively mediate the relationship between a firm's resources and performance. In addition, Lin and Wu (2014) suggested that dynamic capabilities effectively mediate a firm's valuable assets to improve performance.

Zhou and Li (2007) see the need for future studies to examine mediating mechanisms from a dynamic capability perspective. This paper develops and tests a contingency model of how different types of dynamic capabilities mediate the effects of technology orientation on firm performance. Specifically, we investigate how the relationship between technology orientation and performance may be mediated by dynamic capabilities. Accordingly, we contribute to the literature by exploring the role and performance consequences, of dynamic capabilities. Given the centrality to both technology orientation and firm performance, within this article, we examine the role of different dynamic capabilities engagement in connection with these constructs. Dynamic capabilities are viewed as the mechanisms that facilitate the creation of new advantages which are difficult for competitors to imitate (Borch and Madsen, 2007). This is an important issue to consider: that "dynamic capabilities actually consist of identifiable and specific routines that often have been the subject of extensive empirical research in their own right outside of resource-based view" (Eisenhardt and Martin, 2000, p.1107).

As Voss and Voss (2000) argued, a technology orientation can be considered as a main component of firm competitiveness that usually leads the firm to superior performance, and the mediating effect of dynamic capabilities engagement upon technology orientation–SMEs' performance relationship is of critical importance to this (Salavou, 2005). Zhou and Li (2009) indicate that strategic orientations are important drivers of adaptive capability and between the three types of strategic orientation; technology orientation has a stronger effect on adaptive capability.

Since technology orientation is a strategic resource, it can be suggested as a superior organizational resource, and dynamic capabilities mediating is a complementary resource that will improve SMEs performance. Hence, our second hypothesis is proposed:

H2: SMEs' dynamic capabilities have a positive mediating effect on the relationship between technology orientation and firm performance.

2.3 Meditating influence of dynamic capabilities engagement

Following the approach of Teece et al. (1997), in this study a firm's dynamic capabilities have been classified into three specific groups; integration, learning and reconfiguration capabilities. The resources that are possessed by a firm can be classified as internal resources and other resources that a firm tries to obtain from outside of the firm by some method like cooperative alliances. These have been classified as external resources (Johnson and Sohi, 2003). Reconfiguration capability is a firm's capability that reconstructs or transforms existing resources to new resources in order to address rapidly changing environments (Amit and Schoemaker, 1993).

According to Wu (2007) dynamic capabilities have a significant mediating effect on the relation of the firm's resources and performance. Accordingly, dynamic capabilities can be considered as a transformer that have this ability to convert a firm's resources into improved performance (Protogerou et al., 2012).The relationship between VRIN (valuable, rare, inimitable and non-substitutable) resources and dynamic capabilities has been investigated by Lin and Wu (2014), and they suggest that dynamic capabilities can effectively generate some competitive advantage for the firm by extracting the competitive combinations of VRIN resources in order to enhance firm performance. As Aoki (1990) suggested, firm competence is dependent on the adequate integration of a firm's resources (internal and external).In addition, according to Iansiti and Clark (1994) there is a positive relationship between knowledge integration capability and firm performance. In another study, Porrini (2004) suggested that integration capability can positively convert valuable resources into enhanced performance.

Based on Protogerou et al. (2012), "learning capability can be conceived of as a principal means of attaining strategic renewal. Renewal requires that organizations explore and learn new ways while at the same time exploit what they have already learned". It can be suggested that the quality level of a firm's operations lies in the effective and efficient integration of repetition and review. According to Lubatkin et al. (2006) learning capabilities provide this opportunity for the firm to reduce the number of mistakes through the knowledge created from past experiences when they are developing or producing new products or services. Learning capabilities also enable firms to investigate new knowledge and develop new products (Yalcinkaya et al., 2007; Yarahmadi et al., 2015). There is a strong and positive relationship between learning new knowledge, concept and expertise and firm performance (Mody, 1993). According to Hult et al. (2004) learning orientation has a positive influence on a firm's innovative capability. It is crucial for the firm to make some changes and update their business direction through internal and external learning in order to deal with fast-changing environments (Lavie, 2006). Based on Lin and Wu (2014; p.409) a firm can achieve internal learning "through training, knowledge database maintenance and knowledge sharing program". They also suggested that a firm can achieve external learning through external sources such as learning seminars and communities.

It has been suggested by Amit and Schoemaker (1993) and Schoemaker and Amit (1993) that a firm should recreate or transform its internal and external resources frequently in order to deal with the highly competitive global market. According to Teece et al.(1997), reconfiguration capability can be considered as a key dynamic capability that monitors market changes in order to help the firm respond to these changes by an accurate reconfiguration of the firm's resources. As New bert (2005) suggested, there is a relationship between reconfiguration capabilities and the success of any new firm formation process.

Lavie (2006) introduced a capability reconfiguration model to help the firms to cope with today's highly changeable technological environment. Moreover, there is no doubt that in this highly volatile environment, strategic flexibility is crucial for firms to enable them to be more flexible in using and reconfiguring their resources to respond to the market changes rapidly and accurately (Protogerou et al., 2012; Barreto, 2010).

3. Methods

As the nature of this study is exploratory, constructs and measurements were designed and established based on previous studies. Accordingly, the measures were adopted from previous relevant studies and in order to provide an acceptable measurement quality a minor modification in wording was done to increase their applicability in the Iranian context.

This study used three constructs, including technology orientation, dynamic capabilities and performance. It uses an approach that is based on the research of Gatignon and Xuereb (1997) to measure technology orientation. According to Gatignon and Xuereb(1997, p.82), a firm's technology orientation includes "the use of sophisticated technologies in new product development, the rapidity of integration of new technologies, and proactively developing new technologies and creating new product ideas."

Therefore, technology orientation is measured using five items which are: sophisticated technologies, state-of-the-art technology, technological innovation based on research results, technological innovation in program/project management, and development of new technologies (Gatignon and Xuereb, 1997; Hamel and Prahalad, 1994; Prahalad and Hamel, 1994; Tushman and Anderson, 1986; Zhou et al., 2005) (Cronbach's α = .78). In order to measure dynamic capabilities, we adopted integration, learning and reconfiguration capabilities, according to the approach of Teece et al. (1997) and Eisenhardt and Martin (2000) (Cronbach's α = .81).For measuring performance, this study adopts the Balanced Scorecard (BSC) by Kaplan and Norton (1996) and considers four perspectives (financial, customer, internal business process; and learning and growth) (Cronbach's α = .86).The modified version by Spillan and Parnell (2006) was also consulted. Unless specifically indicated, all measurements use five-point Likert scales (1: *Strongly disagree* to 5: *Strongly agree*).

4. Analytical results

4.1. Sample and data collection

To collect data, this study distributed a questionnaire survey to SMEs located in Science and Technology Parks in Iran.

These areas provide an appropriate context to test the hypotheses of this research because they are the most developed regions in Iran (Iran Statistical Yearbook 2012-2013). A sample of 500 SMEs was selected randomly from a list of SMEs.

The measures for this study were designed in English, then, for use in Iran, translated into Persian following the back-translation process to ensure conceptual equivalence (Zhou and Li, 2010). To assess the content validity and accuracy of the survey items, 10 SMEs' senior managers in Iran were chosen to pre-test the survey questions. As has been noted by Lin and Wu (2014) the aim of this pre-test is to assess the questionnaire and the administration process. The results indicated that there were a few items that needed to be modified to reduce ambiguities in the wording.

Consistent with Zhou et al. (2005) to increase the response rate, an official university letter was prepared and enclosed with the questionnaires explaining the academic purpose of the research to the respondents and the confidentiality of their responses. Respondents also were informed they would receive a summary report of the research. Additionally, after mailing the questionnaires, all respondents were re-contacted via phone to confirm that they had received the questionnaire and they also were asked to complete and return the questionnaire promptly. These efforts were highly effective and helpful. We obtained 154 completed surveys from 500 questionnaires distributed, representing 30.8% return rate.

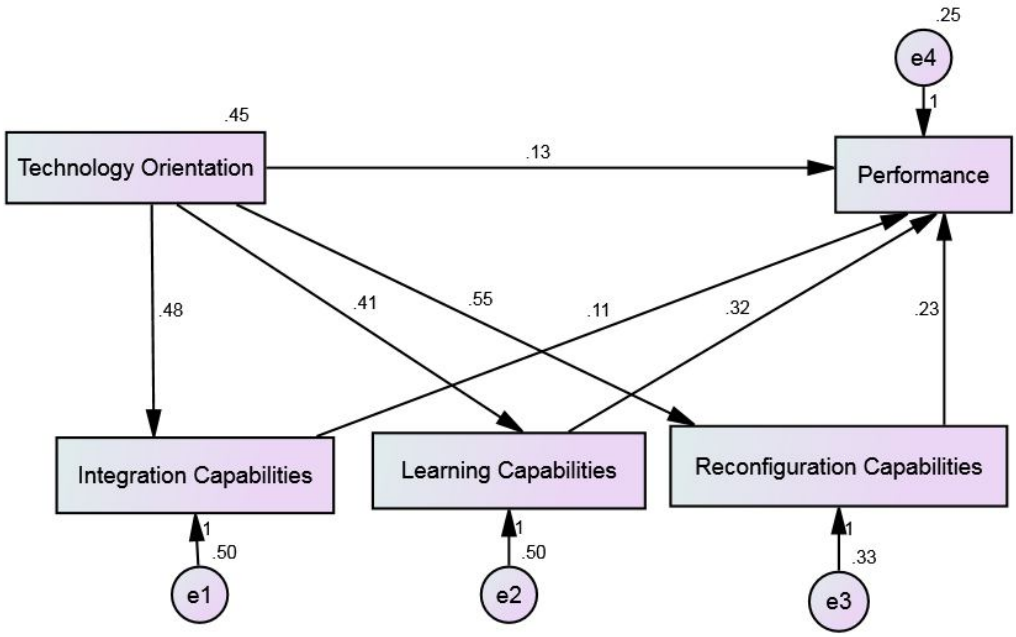
4.2. Analyses and results

We used structural equation modelling to test hypotheses. It was selected due to the characteristics of the research variables. As Edelman et al. (2005) suggested structural equation modeling is an attractive technique for testing mediating variables, and is a particularly attractive choice because it is possible to test all of the relevant paths directly, whilst complications, such as measurement error and feedback, can be directly incorporated into the model (Edelman et al., 2005; Venkatraman, 1989). In accord with the above literature, in the current study path analysis was performed for hypothesis testing. As has been noted by Chaudhuri and Holbrook (2001) when the sample size is relatively small, the use of full structural equation models will be limited; therefore, path analysis is a common technique for testing the hypothesis.

A path model has been shown in Figure 1 which assumes the mediating effect of dynamic capabilities is examined. The analysis of collected data reveals the overall model fit of Technology Orientation, Dynamic Capabilities and Performance ($\chi 2$=45.07 (d.f.=3),P=.000, GFI=.88, AGFI=.42, RMSEA=.30, NFI=.81, CFI=.81, TLI=.38).

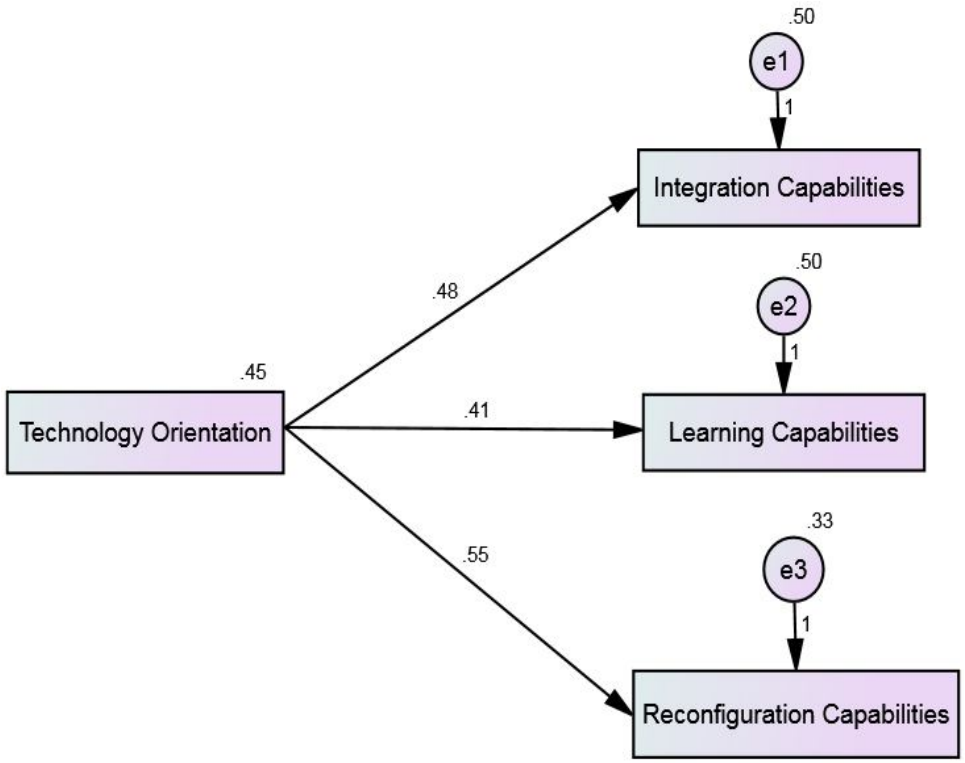
The results indicate that dynamic capabilities exert a significant mediating effect in addition to the direct influence of technology orientation and dynamic capabilities.

Figure 1: The direct and indirect influences (mediating effect) of technology orientation and dynamic capabilities on performance.



Path analyses of the model indicate a significant mediating effect of dynamic capabilities on performance. Consequently, in this study the relationship between technology orientation and dynamic capabilities was examined (Figure 2). The analysis of collected data reveals that technology orientation positively affects the development of dynamic capabilities (β=0.48, t-value=8.08).Additionally, the results indicate that technology orientation has the most significant impact on developing of reconfiguration capability between different types of dynamic capability (β=0.54, t-value=7.86) (Table 1).

Figure 2: The direct effect of technology orientation on different types of dynamic capability

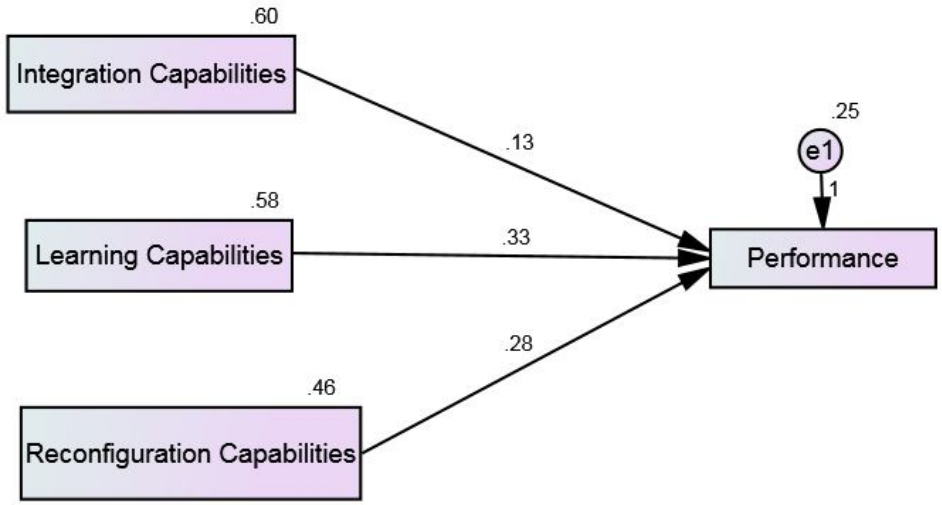


Regarding the relationship between the dynamic capabilities and performance, path analysis (β=0.73, t-value=10.41) shows that dynamic capabilities enhance firm performance (Figure 3).

Table 1: The result of the direct effect of technology orientation on different types of dynamic capability

	Estimate	S.E.	C.R.	P
TO→IC	.484	.085	5.669	***
TO→LC	.411	.086	4.799	***
TO→RC	.546	.069	7.861	***

Figure 3: The direct effect of different types of dynamic capability on performance



Combined with the influence of technology orientation on dynamic capabilities and the effect of dynamic capabilities on performance, the analysis of collected data reveals that dynamic capabilities can mediate strategic orientation on firm performance (Table 2).

Table 2: Testing results

Path	Cofficient	t-value
Technology orientation → Dynamic capability	.48	8.08**
Dynamic capability →Performance	.73	10.14**
Technology orientation→Performance	.43	6.02**

** p<0.01.

As for the relationship between technology orientation and performance, path analysis ($\beta = 0.43$, t-value=6.02) indicates that technology orientation can enhance firm performance.

As Figure 1 shows in this study the mediating effects of three different types of dynamic capabilities, including integration, learning and reconfiguration capabilities were investigated.Tables3 lists the results of path analysis.

The analytical results of this study demonstrate that dynamic learning capability is best fit in the model among the three types of dynamic capability.

Table 3: The mediating effect of the resrech variables

Path	Cofficient	t-value
Learning dynamic capability;		
Learning capability → Performance	.42	6.99**
Technology orientation → Learning capability	.41	4.79**
Technology orientation→Performance	.26	3.92**
Recofiguration dynamic capability;		
Reconfiguration capability → Performance	.41	5.40**
Technology orientation → Reconfiguration capability	.54	7.86**
Technology orientation→Performance	.20	2.64**
Integration dynamic capability;		
Integration capability → Performance	.25	3.93**
Technology orientation → Integration capability	.48	5.66**
Technology orientation→Performance	.31	4.1**

** $p<0.01$.

5. Conclusion

5.1. Findings and discussion

Strategic orientation has long been acknowledged as the key factor for the existence of a firm (Gatignon and Xuereb, 1997; Zhou et al., 2005, Li, 2005). This study makes contributions to the literature on strategic orientation and dynamic capabilities research by exploring and testing the impact of the SMEs technological strategic orientation and different dynamic capabilities on their performance.

Through an empirical study of strategic orientation in SMEs, this study focuses on technology orientation as one of the most important aspects of strategic orientation (Gatignon and Xuereb, 1997) to investigate and consider its direct impact and the mediating effect of different dynamic capabilities on improving performance. Additionally, this study examines the effectiveness of mediating with respect to different dynamic capabilities. Our empirical findings show that technology orientation can improve firm performance. This finding regarding the relationship between technology orientation and firm performance supports the conclusions of previous studies (Gatignon and Xuereb, 1997; Salavou, 2005; Hakala and Kohtamäki, 2011; Zhou et al., 2005).

Despite the growing interest in strategic orientation and dynamic capabilities, there are limited investigations in respect of technology orientation effect on dynamic capabilities, and dynamic capabilities on the technology orientation –performance relationship in SMEs; and, to our knowledge, these effects have not been empirically explored previously in this way. Regarding the relationship between technology orientation and dynamic capabilities, path analysis demonstrates that technological orientations positively affect the development of integration, learning, and reconfiguration capabilities.

Furthermore, our findings suggest that dynamic capabilities associate positively with mediate technology orientation to enhance firm performance. Therefore, SMEs can improve their competitive advantages and thus their performance by employing a technology orientation, and developing dynamic capabilities in order to mediate technology orientation. Accordingly, the important role of technology orientation is addressed because of its direct effect on performance, and also its indirect effect mediated by dynamic capabilities.

In addition, dynamic learning capability between other dynamic capabilities has the most significant mediating effect. Consequently, for SMEs with technology orientation, it is beneficial to develop dynamic learning capability through learning new knowledge, concepts and expertise.

The analytical results of this study demonstrate that both technology orientation and dynamic capabilities assist SMEs to achieve competitive advantages. Therefore, according to our results and combining a strategic orientation view and dynamic capabilities view, an integrated consideration of both technology orientation and dynamic capabilities can be suggested for SMEs to improve their performance. The results from the present study provide empirical support for the dynamic capability view of the firm, which stresses its ability as a moderating influence on the strength of the relationship between technology orientation and performance in the context of SMEs (Lin and Wu, 2014).

5.2. Limitations of the study and future research directions

Our study has some limitations, which also provide some directions for future research. It is subject to the usual limitations of a limited sample and subjective measures. The Science and Technology Parks in Iran provide the study context, because using state-of-the-art technologies makes dynamic capabilities more prominent for SMEs operating there. Accordingly, because our empirical findings are based on data from Iran, generalizing from the findings of this study is limited. Survey data and evidence from different countries or other emerging or developed economies, and across industries is required for generalization of the study at a broader level, and to assess the stability and generalis ability of the research findings.

This study investigated the performance implications of a firm's dynamic capability and technological orientation in an Iranian SMEs context, and, due to applying a cross-sectional research design; it is limited in its causal implications. Thus, the study makes no claim to assess empirically the sustainability of technology orientation and dynamic capabilities on SMEs performance. Further studies should aim to use the longitudinal data to examine the sustainability of performance advantage more accurately.

As different classification of dynamic capabilities may lead the study to different results, we hope that future research will take up further exploring and testing the different classification of dynamic capabilities to investigate their role. We also believe that future research could add to the literature by studying other strategic orientations (e.g. customer orientation, competitive orientation, innovation orientation and entrepreneurial orientation).

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