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## EFFECTS OF TOP MANAGEMENT SUPPORT, TECHNOLOGICAL SKILLS, AND CAPABILITIES ON ENTREPRENEURSHIP AND ORGANIZATIONAL PERFORMANCE

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### **1. INTRODUCTION**

The main topic of organizational analysis is performance. Performance and its significance in

achieving goals, as well as factors that can influence efficiency and effectiveness of performance are \*Corresponding author (N.Roustapisheh). Email: nrousta87@gmail.com. ©2019 International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Volume 10 No.17 ISSN 2228-9860 eISSN 1906-9642 CODEN: ITJEA8 Paper ID:10A17F http://TUENGR.COM/V10A/10A17F.pdf DOI: 10.14456/ITJEMAST.2019.232 discussed in most public and private organizations (Beygi & Fotros, 2009). Given the significance of performance in achieving organizational goals, it is essential to evaluate organizational performance accurately and identify and develop the factors which are effective in improvement and effectiveness of performance (Noruzy et al., 2013).

Entrepreneurship has been an important scientific topic since the late 20<sup>th</sup> century, especially at the startup stage (Koohi and Feizbakhsh, 2018). Currently, creative and innovative entrepreneurs worldwide have been a source of great developments in various fields of industry, education, services, etc. (Badri et al., 2006, Nakhaei et al., 2018). Entrepreneurial skills are vital for any type and size of organizations (Chrisman et al., 2003; Drucker, 2014). Thompson (1999) believes that entrepreneurial skills are essential requirements of all organizations (public, private, voluntary, etc.) in any size (large, medium and small). Organizational entrepreneurship as one of the mechanisms and measures of progress and survival of current organizations has attracted the attention of many researchers and managers (Zahra, 1992, 2012). The output of entrepreneurship is the increased competitiveness and flexibility. Entrepreneurship has its own requirements. The main reason that organizations seek entrepreneurship is that they require growth, development and competitive advantage for survival and those are achieved by entrepreneurship (Floid & Wooldridg, 1999; Wales et al., 2011). Modern organizations require great changes and high flexibility, which are achieved by entrepreneurship (Drucker, 2014; Van Doorn et al, 2015). Studies have shown that organizational entrepreneurship has an effect on organizational performance (Bojica & Fuentes, 2011; Martín-Rojas et al, 2011; Garcia-Morales, 2014). Now, the question is what entrepreneurial mechanisms of the organization are and how entrepreneurial skills are fostered; what factors facilitate the promotion of these capabilities. Accordingly, this study evaluates the effect of top management support, capabilities and technological skills on entrepreneurship and organizational performance.

Currently, technology could be considered as one of the most worthy assets of organizations to increase productivity and growth (Zahra & Kirchhoff, 2005). Various advances in information technology (IT) capabilities have evolved the industry over the past decade. Adoption and implementation of IT impose distinct competitiveness on the organization (Liu et al, 2013). Access to comprehensive information and application of IT well-timed possibly improve inspiration and creativity and prevent resource waste, unnecessary duplications and, above all, useless decision-making (Janvier-James, 2012; Samadi et al., 2014). Therefore, recent studies have been interested in how firms invest their IT research to reach a competitive advantage (Huang, 2011).

Literature has highlighted the role of skills, capabilities, and competencies associated with technology as well as acquisition and application of knowledge (i.e., absorptive capacity) due to their important role in business performance of organizations (Lee et al., 2001; Martín-Rojas, 2011; Garcia-Morales et al, 2014). However, few studies have examined the effect of top management support of technology on the improvement of these technological skills, competencies, and capabilities. Moreover, previous studies have not addressed the effect of technological skills and capabilities as well as absorptive capacity on important organizational variables such as organizational entrepreneurship which is crucial to discover new business opportunities for improving organizational performance (Hayton, 2005; Garcia-Morales et al, 2014).

Technological skill is defined as specific technique of the organization and scientific

understanding of employees (Leonard-Barton, 1992), while technological distinctive competencies indicate ability or expertise of the organization to use scientific and technical knowledge through a set of processes and procedures for developing and improving products and processes (Real, Leal & Roldán, 2006). Effect of technological skills, technological distinctive competencies and absorptive capacity on entrepreneurship has not been addressed in previous studies. Entrepreneurship is a process in which individuals undertake new activities within the organization and tend to separate from normal processes to achieve new opportunities (Zampetakis & Moustakis, 2010). Studies show that technological skills, technological distinctive competencies, and absorptive capacity have a positive effect on entrepreneurship (Zahra et al, 1999; Zahra et al, 2009; Garcia-Morales et al, 2014).

Absorptive capacity refers to the ability of enterprises to recognize, absorb and use new values and external information for commercial purposes (Cohen & Levinthal, 1990; Garcia-Morales et al, 2014). Absorptive capacity is widely used in the organization to review innovation process and examine the effect of organizational learning on competitive advantage. In fact, absorptive capacity is a phenomenon that helps people learn and increases their ability to absorb information simultaneously (Garcia-Morales et al, 2014).

Zahra and George (2002) identified four dimensions of absorptive capacity, including acquisition, absorption, conversion, and application of knowledge. Acquisition is defined as a capacity to recognize, understand and acquire external knowledge required for operations of an organization. Hamel (1991) considers the acquisition of new specialized knowledge as a stimulus for organizational collaboration.

According to Ghosh et al (2001), all technological variables require top management commitment to support technology development within the organization. Top management support refers to top executive managers and their assistants who are responsible for corporate policies (BolíVar-Ramos et al, 2012). In fact, top management support of technology is defined as a technological strategy to direct the organization to identify, acquire, develop and use technology in order to achieve competitive advantage (Lanctot & Swan, 2000). Positive perceptions of top management in relation to usefulness of technology lead to special managerial actions to absorb new technologies (Liang et al, 2007). In technological context, top management support refers to the degree to which top management recognizes the importance of technological functions and is involved in activities related to technological success (Garcia-Morales et al, 2014).

Effectiveness of top management support on the development of technological skills, technological distinctive competencies, and absorptive capacity is one of the main topics of discussion for organizations. Therefore, companies are always under pressure to develop new skills and competencies and require acquisition and discovery of new knowledge to survive competitive activities (Garcia-Morales et al, 2014; Huang, 2011). Top managers and directors are enthusiastic to improve and develop information system management. Although the problems with design and completion of a comprehensive, integrated information system for large corporations are primarily managerial rather than technical, little is known about the role of managers in developing information systems or participation of top management in development of this system (Doll, 1985).

Thus, top management support is one of the determinants in increasing levels of technological

skills, because top management is responsible for providing adequate resources for technological training to improve IT knowledge of employees (BolíVar-Ramos et al., 2012; Keramati et al., 2013). In addition, top management support influences the development of technological distinctive competencies. Thus, top management plays an important role in the support of innovation and technology development in dynamic and competitive environments (Huang, 2011).

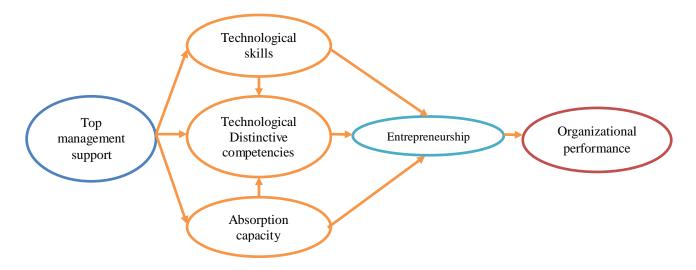
Top management support is essential for enabling organizations to access, absorb and use knowledge for commercial purposes. For example, top management support influences the implementation of IT which in turn leads to improved knowledge base and thus facilitated knowledge sharing and absorption (Alavi & Leidner, 2001; Garcia-Morales et al, 2014; Gholami et al., 2013). This increased absorptive capacity, in turn, leads to technological distinctive competencies, because these competencies are rooted in organizational knowledge (Real et al, 2006).

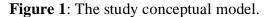
The review of the empirical literature reveals that few studies have addressed the effect of top management support, technological skills and capabilities on entrepreneurship and organizational performance. Therefore, the main problem of the current study is the effect of top management support, technological skills, and capabilities on entrepreneurship and organizational performance.

### 2. CONCEPTUAL MODEL

According to theoretical literature, the conceptual model is illustrated in Figure 1. Hypotheses are developed based on the conceptual model, as follows:

- 1) Top management support is effective in technological skills.
- 2) Top management support is effective on technological distinctive competencies.
- 3) Top management support is effective in absorptive capacity.
- 4) Technological skill is effective on technological distinctive competencies.
- 5) Absorptive capacity is effective on technological distinctive competencies.
- 6) Technological skill is effective on entrepreneurship.
- 7) Technological distinctive competency is effective in entrepreneurship.
- 8) Absorptive capacity is effective in entrepreneurship.
- 9) Entrepreneurship is effective in organizational performance.





### 3. MATERIALS AND METHODS

The methodology used for this study is descriptive (non-experimental) and correlational using structural equation modelling (SEM) because this study examines the relationships between variables through a causal model.

### **3.1 PARTICIPANTS**

Participants included 300 employees of Iranian software developer companies. Questionnaires were distributed among the participants. Out of 300 questionnaires, 263 questionnaires were returned of which 15 questionnaires were excluded from the analysis because many of the questions were not responded. Finally, 248 questionnaires were included in the analysis.

### 3.2 DATA COLLECTION

**Top management support**: the questionnaires developed by Byrd and Davidson (2003) and Ray et al (2005) are used to measure top management support. Based on these two questionnaires, Garcia-Morales et al (2014) developed a 4-item questionnaire that was used for the current study. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

**Technological skills**: the questionnaires developed by Ray et al (2005) and Byrd and Davidson (2003) are used to measure technological skills. Based on these two questionnaires, Garcia-Morales et al (2014) developed a 4-item questionnaire that was used for the current study. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

**Absorptive capacity**: an 11-item questionnaire developed by Jiménez et al (2011) was used to measure absorptive capacity. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

**Technological distinctive competencies**: a 6-item questionnaire developed by Real et al (2006) was used to measure technological distinctive competencies. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

**Entrepreneurship**: a 16-item questionnaire developed by Knight (1997) and Zahra (1993) was used to measure entrepreneurship. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

**Organizational performance**: a 5-item questionnaire developed by Murray and Kotabe (1999) and Zahra (1993) was used to measure organizational performance. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

Index	RMSEA	GFI	ÅGFI	CFI	NFI	Cronbach's alpha
Top management support	0.043	0.96	0.94	1	0.99	0.87
Technological skill	0.039	0.97	0.96	1	1	0.79
Absorptive capacity	0.067	0.93	0.90	0.98	0.97	0.87
Technological distinctive competencies	0.052	0.95	0.92	0.99	0.99	0.76
Entrepreneurship	0.064	0.93	0.91	0.97	0.96	0.95
Organizational performance	0.047	0.96	0.95	1	1	0.91

**Table 1**: fit indexes of confirmatory factor analysis

The reliability and validity of the questionnaires were evaluated by Cronbach's alpha and factor

analysis, respectively. Table 1 reports the results of Cronbach's alpha and confirmatory factor analysis of variables. Obviously, all the indexes are well fitted to the variables.

#### **3.3 DATA ANALYSIS**

By calculating descriptive statistics, SEM was used to examine the causal relationship between variables. The software SPSS and LISREL were used for data analysis.

### 4. **RESULTS**

The analysis of causal models is based on the correlation matrix. Table 2 shows correlation matrix, mean and standard deviation of variables.

<b>Table 2</b> : conclution matrix of variables								
Variables	1	2	3	4	5	6		
1. Top management support	1							
2. Technological skill	0.43**	1						
3. Absorptive capacity	0.46**	0.65**	1					
4. Technological distinctive competencies	0.38**	0.60**	0.54**	1				
5. Entrepreneurship	0.63**	0.63**	0.53**	0.50**	1			
6. Organizational performance	0.46**	0.34**	0.38**	0.30**	0.58**	1		
Mean	2.82	3.02	3.26	3.22	2.93	2.89		
SD	1.02	0.89	0.73	0.72	0.87	0.99		
* P<0.05: ** P<0.01								

Table 2: correlation matrix of variables

As shown in Table 2, there is a significant positive correlation between top management support and technological skill (r = 0.43), absorptive capacity (r = 0.46), technological distinctive competencies (r = 0.38), organizational entrepreneurship (r = 0.63) and organizational performance (r = 0.46). There is a significant positive correlation between technological skill and absorptive capacity (r = 0.65), technological distinctive competencies (r = 0.63) and organizational performance (r = 0.34). There is a significant positive correlation between absorptive capacity and technological distinctive competencies (r = 0.54), entrepreneurship (r = 0.53) and organizational performance (r = 0.38). There is a significant positive correlation between technological distinctive competencies and entrepreneurship (r = 0.50) and organizational performance (r = 0.30). There is a significant positive correlation between technological distinctive competencies and entrepreneurship (r = 0.50) and organizational performance (r = 0.30). There is a significant positive correlation between technological distinctive competencies and entrepreneurship (r = 0.50) and organizational performance (r = 0.30). There is a significant positive correlation between technological distinctive competencies and entrepreneurship (r = 0.50) and organizational performance (r = 0.30). There is a significant positive

From the fitted model, it is found that top management support has a significant positive effect on absorptive capacity and technological skill, while top management support has no significant effect on technological distinctive competencies. Technological skill and absorptive capacity have a significant positive effect on technological distinctive competencies. Technological distinctive competency, technological skill, and absorptive capacity have a significant positive effect on entrepreneurship. Entrepreneurship has a direct, significant and positive effect on organizational performance.

The objective of this study is to determine the mediating role of technological skills, technological distinctive competencies and absorptive capacity in the relationship between top management support, organizational entrepreneurship and organizational performance by SEM. Table 3 lists values of direct effects, indirect effects, total effects, variance explained for the variables.

As shown in Table 3, the direct effect of entrepreneurship is significant and positive on organizational performance ( $\beta = 0.61$ ). Direct effect of technological distinctive competencies ( $\beta = 0.33$ ), technological skill ( $\beta = 0.51$ ) and absorptive capacity ( $\beta = 0.37$ ) is significant and positive on

organizational entrepreneurship. The direct effect of technological skill ( $\beta = 0.48$ ) and absorptive capacity ( $\beta = 0.42$ ) is significant and positive on technological distinctive competencies. The direct effect of top management support is not significant on technological distinctive competencies. The direct effect of top management support is significant and positive on absorptive capacity ( $\beta = 0.49$ ) and technological skill ( $\beta = 0.44$ ). The indirect effect of top management support is significant and positive on entrepreneurship and organizational performance. The indirect effect of absorptive capacity, technological distinctive competencies, and technological skills are positive and significant on organizational performance. In total, the model explains 37% variance in organizational performance, 51% variance in entrepreneurship, 43% variance in technological distinctive competencies, 24% absorptive capacity and 20% variance in technological skills. Fit indexes of the SEM are listed in Table 4.

**Table 3**: An estimate of the standardized values of direct effect, indirect effect, total effect, and variance explained of the model

Path	Direct effect	Indirect effect	Total effect	Variance explained	
On organizational performance vie					
Entrepreneurship	0.61**	-	0.61**		
Technological distinctive competencies	-	0.20**	0.20**	37%	
Absorptive capacity	-	0.31**	0.31**	57%	
Technological skill	-	0.41**	0.41**		
Top management support	-	0.36**	0.36**		
On entrepreneurship vie					
Technological distinctive competencies	0.33**	-	0.33**		
Absorptive capacity	0.37**	0.14**	0.51**	51%	
Technological skill	0.51**	0.16**	0.67**		
Top management support	-	0.86**	0.86**		
On technological distinctive competencies vie					
Absorptive capacity	0.42**	-	0.42**	43%	
Technological skill	0.48**	-	0.48**	43%	
Top management support	0.14	0.41**	0.55**		
On absorptive capacity vie				24%	
Top management support	0.49**	-	0.49**	∠470	
On technological skill vie				20%	
Top management support	0.44**	-	0.44**	20%	

\* P<0.05; \*\* P<0.01

$\chi^2/df$	RMSEA	GFI	AGFI	CFI	NNFI
1.86	0.059	0.94	0.92	0.99	0.98

As shown in Table 4,  $\chi^2/df = 1.86$ , GFI = 0.94, AGFI = 0.92 and RMSEA = 0.059, which are good. Thus, the model is well fitted.

### 5. DISCUSSION

The purpose of this study was to examine the effect of top management support, technological skills, and capabilities on entrepreneurship and organizational performance. SEM results showed that the suggested model is relatively well fitted to the data and can explain 37% variance in organizational performance, 51% variance in entrepreneurship, 43% variance in technological distinctive competencies, 24% absorptive capacity and 20% variance in technological skills.

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SEM results showed that top management support has a significant and positive effect on technological skills. This is consistent with Byrd and Davidson (2003), Garcia-Morales et al (2007) and Garcia-Morales et al (2014). Top management provides adequate resources for training programs to improve technological expertise and thus technological skills of employees. Therefore, senior management support plays a deterministic role in increasing technological skills.

The results showed that the direct effect of top management support is not significant on technological distinctive competencies. Therefore, it can be concluded that top management support has no direct effect on technological distinctive competencies; instead, it promotes technological distinctive competencies through increasing absorptive capacity and improving skills of employees.

SEM results showed that top management support has a significant and positive effect on absorptive capacity. This finding is consistent with Camisón and Forés (2010) and Garcia-Morales et al (2014). Knowledge absorptive capacity will increase if top management supports the promotion of IT projects, allocate adequate funds to research and development in the field of technology, reconstructs work processes as leverage of technological opportunities within the organization, and facilitates technology transfer in the organization.

The results showed that technological skill has a significant and positive effect on technological distinctive competencies. This finding is consistent with Benitez et al (2010) and Garcia-Morales et al (2014). Technological distinctive competencies will increase in the organization by the very good performance of hardware and operating systems, optimal performance of employees in using business application, and skills of IT department in using programming languages.

SEM results showed that absorptive capacity has a significant and positive effect on technological distinctive competencies. This finding is consistent with Wood and Weigel (2011) and Garcia-Morales et al (2014). Absorptive capacity leads to technological distinctive competencies through acquisition and sharing of knowledge, because these competencies are rooted in corporate knowledge (Real et al, 2006). Zahra and George (2002) suggest that companies acquire, absorb, transform and exploit knowledge through absorptive capacity to create a dynamic organizational capability. These four dimensions enable companies to re-shape their resources, adapt to changing market conditions and achieve competitive advantage.

The results showed that technological skills a significant and positive effect on entrepreneurship. Therefore, the improvement of technological competencies and skills of employees improve entrepreneurship. This is consistent with Zahra et al (1999), Zahra et al (2009) and Garcia-Morales et al (2014). In line with this finding, Zahra and Kevin (2000) claim that technology is one of the key drivers to entrepreneurship and the key idea of change. These changes redefine business concepts, and design and apply new innovative systems.

The results showed that technological distinctive competencies have a significant and positive effect on entrepreneurship. This finding is consistent with Hussinger (2010) and Garcia-Morales et al (2014). Entrepreneurship will increase in an organization which is able to obtain information about status and progress of relevant sciences and technologies; produce advanced technological processes; absorb new technologies and beneficial innovations; attract and retain qualified scientific and technical personnel; control, generate or absorb key business technology; and launch programs for

development of domestic technology or technology absorptive competencies from research and development centers or suppliers and customers effectively.

SEM results showed that absorptive capacity has a significant and positive effect on entrepreneurship. This finding is consistent with Zahra et al (2009) and Garcia-Morales et al (2014). The organization can improve entrepreneurship by close personal interactions, relationships based on mutual trust and reciprocity, consistent management styles and cultures, organized meetings of departments to discuss about development and approaches, distribution of information among departments, capabilities required for ensuring the flow of knowledge within the organization and sharing of knowledge between departments, clear assignment of responsibilities regarding external knowledge, and capabilities required for discovering external knowledge.

The results showed that entrepreneurship has a significant and positive effect on organizational performance. This finding is consistent with Bojica and Fuentes (2011), Martín-Rojas et al (2011) and Garcia-Morales et al (2014). Organizational performance will be improved by new demands on existing products and services in current markets through advertising and marketing, expansion of current business lines, pursuit of new businesses in new industries related to recent activities, offering of new services and products to new markets, allocation of resources for development of new services and products, increased number of services and products in the market, emphasis on research and development and innovation, introduction of new services and products, managerial techniques and operational technologies, tendency to run high-risk projects, broad and bold actions to achieve goals, reorganization of departments to increase innovation, and flexible structure of the organization to increase innovation (Nazari-Shirkouhi and Keramati, 2017; Nazari-Shirkouhi et al., 2013). Therefore, entrepreneurship results from venture investments, the profitable establishment of the organization, changed strategies to take advantage of innovation and utilization of knowledge to expand profitability and success of organizations and improves organizational performance.

### 6. CONCLUSION

This study showed that top management support is effective in the development of technological skills, technological distinctive competencies and absorptive capacity through which it increases entrepreneurship and organizational performance. Therefore, top management influences entrepreneurship and organizational performance by providing adequate resources for technological training to improve IT knowledge of employees, using scientific and technical knowledge by developing and improving products and processes, and enabling the organization to access, absorb and utilize knowledge. This project addressed a sample of software developer companies; thus, it will be difficult to generalize findings. Moreover, findings are based on self-report data. It is recommended to use qualitative and hybrid methods in future studies to understand the factors which are effective in entrepreneurship and organizational performance.

### 7. DATAT AND MATERIAL AVAILABILITY

Relevant information regarding this study is available by requesting to the corresponding author.

### 8. REFERENCES

- Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.
- Badri, E., Liaghatdar, M., Abedi, M. & Jafari, E., (2006). Entrepreneurship Capabilities of students. *Research and planing in higher education*, 40(1), 23-32.
- Benitez-Amado, J., Llorens-Montes, F. J., & Nieves Perez-Arostegui, M. (2010). Information technology-enabled intrapreneurship culture and firm performance. *Industrial Management & Data Systems*, 110(4), 550-566.
- Beygi, T. & Fotros, M.-H., (2009). Measurement of the effect of human capital on organizational performance of banking industry focusing on intangible assets. *Industrial management*, 4(10), 81-89.
- Bojica, A. M., & Fuentes, M. D. M. F. (2012). Knowledge acquisition and corporate entrepreneurship: Insights from Spanish SMEs in the ICT sector. *Journal of World Business*, 47(3), 397-408.
- BolíVar-Ramos, M. T., GarcíA-Morales, V. J., & GarcíA-SáNchez, E. (2012). Technological distinctive competencies and organizational learning: Effects on organizational innovation to improve firm performance. *Journal of Engineering and Technology Management*, 29(3), 331-357.
- Byrd, T. A., & Davidson, N. W. (2003). Examining possible antecedents of IT impact on the supply chain and its effect on firm performance. *Information & Management*, *41*(2), 243-255.
- Camisón, C., & Forés, B. (2010). Knowledge absorptive capacity: New insights for its conceptualization and measurement. *Journal of Business Research*, 63(7), 707-715.
- Chrisman, J. J., Chua, J. H., & Sharma, P. (2005). Trends and directions in the development of a strategic management theory of the family firm. *Entrepreneurship theory and practice*, 29(5), 555-576.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly*, 128-152.
- Doll, W. J. (1985). Avenues for top management involvement in successful MIS development. *MIS quarterly*, 17-35.
- Drucker, P. (2014). Innovation and entrepreneurship. Routledge.
- Floyd, S. W., & Wooldridge, B. (1999). Building strategy from the middle: Reconceptualizing strategy process. Sage.
- García-Morales, V. J., Bolívar-Ramos, M. T., & Martín-Rojas, R. (2014). Technological variables and absorptive capacity's influence on performance through corporate entrepreneurship. *Journal of Business Research*, 67(7), 1468-1477.
- Garcia-Morales, V. J., Ruiz-Moreno, A., & Llorens-Montes, F. J. (2007). Effects of technology absorptive capacity and technology proactivity on organizational learning, innovation and performance: an empirical examination. *Technology Analysis & Strategic Management*, 19(4), 527-558.
- Gholami, M. H., Asli, M. N., Nazari-Shirkouhi, S., & Noruzy, A. (2013). Investigating the influence of knowledge management practices on organizational performance: an empirical study. Acta Polytechnica Hungarica, 10(2), 205-216.
- Ghosh, B. C., Liang, T. W., Meng, T. T., & Chan, B. (2001). The key success factors, distinctive capabilities, and strategic thrusts of top SMEs in Singapore. *Journal of Business Research*, *51*(3), 209-221.
- Hamel, G. (1991). Competition for competence and interpartner learning within international strategic alliances. *Strategic management journal*, *12*(S1), 83-103.
- Hayton, J. C. (2005). Competing in the new economy: the effect of intellectual capital on corporate entrepreneurship in high-technology new ventures. *R&D Management*, 35(2), 137-155.
- Huang, K. F. (2011). Technology competencies in competitive environment. *Journal of Business Research*, 64(2), 172-179.
- Hussinger, K. (2010). On the importance of technological relatedness: SMEs versus large acquisition targets. *Technovation*, *30*(1), 57-64.

- Janvier-James, A. M. (2012). A new introduction to supply chains and supply chain management: Definitions and theories perspective. *International Business Research*, 5(1), p194.
- Jiménez-Barrionuevo, M. M., García-Morales, V. J., & Molina, L. M. (2011). Validation of an instrument to measure absorptive capacity. *Technovation*, 31(5), 190-202.
- Keramati, A., Nazari-Shirkouhi, S., Moshki, H., Afshari-Mofrad, M., & Maleki-Berneti, E. (2013). A novel methodology for evaluating the risk of CRM projects in fuzzy environment. *Neural Computing and Applications*, 23(1), 29-53.
- Knight, G. A. (1997). Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation. *Journal of business venturing*, 12(3), 213-225.
- Koohi, S., & Feizbakhsh, M. (2018). A Study on the Effect of Systemic Elements of Entrepreneurial Ecosystem on Startup Success within Discovery Stage. International Transaction Journal of Engineering Management & Applied Sciences & Technologies, 9(6), 567-577.
- Lanctot, A., & Swan, K. S. (2000). Technology acquisition strategy in an internationally competitive environment. *Journal of International Management*, 6(3), 187-215.
- Lee, C., Lee, K., & Pennings, J. M. (2001). Internal capabilities, external networks, and performance: a study on technology-based ventures. *Strategic management journal*, 22(6-7), 615-640.
- Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic management journal*, 13(S1), 111-125.
- Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: the effect of institutional pressures and the mediating role of top management. *MIS quarterly*, 59-87.
- Liu, H., Ke, W., Wei, K. K., & Hua, Z. (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. *Decision Support Systems*, 54(3), 1452-1462.
- Martín-Rojas, R., García-Morales, V. J., & García-Sánchez, E. (2011). The influence on corporate entrepreneurship of technological variables. *Industrial Management & Data Systems*, 111(7), 984-1005.
- Murray, J. Y., & Kotabe, M. (1999). Sourcing strategies of US service companies: A modified transaction-cost analysis. *Strategic Management Journal*, 20(9), 791-809.
- Nakhaei, G. R., Sobhani, A., Mostaghimi, M. R., & Hosseini, S. M. R. (2018). Identification Effective Components on Organizational Entrepreneurship Pattern in Rural Cooperatives of IRAN. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*. 9(4), 329-340.
- Nazari-Shirkouhi, S., & Keramati, A. (2017). Modeling customer satisfaction with new product design using a flexible fuzzy regression-data envelopment analysis algorithm. *Applied Mathematical Modelling*, 50, 755-771.
- Nazari-Shirkouhi, S., Keramati, A., & Rezaie, K. (2013). Improvement of customers' satisfaction with new product design using an adaptive neuro-fuzzy inference systems approach. *Neural Computing and Applications*, 23(1), 333-343.
- Noruzy, A., Dalfard, V. M., Azhdari, B., Nazari-Shirkouhi, S., & Rezazadeh, A. (2013). Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an empirical investigation of manufacturing firms. *The International Journal of Advanced Manufacturing Technology*, 64(5-8), 1073-1085.
- Ray, G., Muhanna, W. A., & Barney, J. B. (2005). Information technology and the performance of the customer service process: A resource-based analysis. *MIS quarterly*, 625-652.
- Real, J. C., Leal, A., & Roldán, J. L. (2006). Information technology as a determinant of organizational learning and technological distinctive competencies. *Industrial Marketing Management*, 35(4), 505-521.

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- Samadi, H., Nazari-Shirkouhi, S., & Keramati, A. (2014). Identifying and analyzing risks and responses for risk management in information technology outsourcing projects under fuzzy environment. *International Journal of Information Technology & Decision Making*, *13*(06), 1283-1323.
- Thompson, J. L. (1999). A strategic perspective of entrepreneurship. *International Journal of Entrepreneurial Behaviour & Research*, 5(6), 279-296.
- Van Doorn, S., Heyden, M., Tröster, C., & Volberda, H. (2015). Entrepreneurial Orientation and Performance: Investigating Local Requirements for Entrepreneurial Decision-Making. *Cognition and Strategy* (Advances in Strategic Management, Volume 32) Emerald Group Publishing Limited, 32, 211-239.
- Wales, W., Monsen, E., & McKelvie, A. (2011). The organizational pervasiveness of entrepreneurial orientation. *Entrepreneurship Theory and Practice*, 35(5), 895-923.
- Wang, M., & Russell, S. (2005). Measurement equivalence of the job descriptive index across Chinese and American workers: Results from confirmatory factor analysis and item response theory. *Educational* and Psychological Measurement, 4, 709-732.
- Weiss, H. M. (2002). Deconstructing job satisfaction: Separating evaluations, beliefs and affective experiences. *Human Resource Management Review*, 12(2), 173-194.
- Wood, D., & Weigel, A. (2011). Building technological capability within satellite programs in developing countries. *Acta Astronautica*, 69(11), 1110-112.
- Zahra, S. A. (1992). Environment, corporate entrepreneurship, and financial performance: A taxonomic approach. *Journal of business venturing*, 8(4), 319-340.
- Zahra, S. A. (1993). Environment, corporate entrepreneurship, and financial performance: A taxonomic approach. *Journal of business venturing*, 8(4), 319-340.
- Zahra, S. A. (2012). Organizational learning and entrepreneurship in family firms: Exploring the moderating effect of ownership and cohesion. *Small business economics*, *38*(1), 51-65.
- Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of business venturing*, 10(1), 43-58.
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of management review*, 27(2), 185-203.
- Zahra, S. A., & Kirchhoff, B. A. (2005). Technological resources and new firm growth: a comparison of start-up and adolescent ventures. *Research in the Sociology of Work, 15*, 101-122.
- Zahra, S. A., Filatotchev, I., & Wright, M. (2009). How do threshold firms sustain corporate entrepreneurship? The role of boards and absorptive capacity. *Journal of Business Venturing*, 24(3), 248-260.
- Zahra, S. A., Nielsen, A. P., & Bogner, W. C. (1999). Corporate entrepreneurship, knowledge, and competence development. *Entrepreneurship Theory and Practice*, 23(3), 169–189.
- Zampetakis, L. A., & Moustakis, V. S. (2010). An exploratory research on the factors stimulating corporate entrepreneurship in the Greek public sector. *International Journal of Manpower*, *31*(8), 871-887.
- Zampetakis, L. A., & Moustakis, V. S. (2010). An exploratory research on the factors stimulating corporate entrepreneurship in the Greek public sector. *International Journal of Manpower*, *31*(8), 871-887.



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