



International
Interdisciplinary
Journal of Scholarly
Research (IIJSR)

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Publisher

The impact of organizational factors on innovation capability of companies with an emphasis on role of research and development talents and research and development technology: companies in industrial city 1, Zanjan (A case study)

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Abstract

The innovation capability is one of the key and important issues which has been proposed in social sciences. However, this study aimed to investigate the impact of organizational factors on innovation capability of companies with an emphasis on role of research and development talents and research and development technology in companies in industrial city 1, Zanjan. This was applied analytic survey research. A questionnaire was used for collecting the data. The population consisted of all employees and managers of companies which are located in industrial city 1 in Zanjan (N= 275). Using Cochran formula, 160 subjects were selected as sample. The SPSS software was used to estimate the model. The estimation results showed that all components of organizational factors had a significant positive impact on company's innovation capability; however, the positive impact was different among various components of organizational factors.

Keywords: Sustainable Development, Innovation Capabilities, Research and Development Talents, Research and Development Technology.

Introduction

Several actors may be identified in the field of sustainable development from government to corporates to citizens. The responsibility-based approach considers the social, economic, and environmental consequences of decisions and activities at all levels. In fact, the organizations are highly demanded to act responsibly in community. By increasing of their impact on sustainable development factors such as economy, society, and environment, the Corporate Social Responsibility concept has been emerged in management world. The corporate social responsibility means that organizations are responsible in the community in which they are active, because they use its human, natural, and economic resources. Unlike the traditional management and business perspective, the organizations are not just responsible for their shareholders and should not just try to increase short-term profits of their shareholders. Therefore, it is expected that the organizations which are associated with other stakeholders consider their legitimate demands, too. The stakeholders are the entities, groups, and individuals who influence the organization or are affected by it and include employees, customers, business partners, local communities, environment, media, public institutions, citizens, government, and etc. In this regard, the social responsibility may be defined as integrating social and environmental concerns with organizational operations and considering them in interaction between the organization and associated groups. The social responsibility is intertwined with trust. If an organization loses the confidence of community, its reputation will be destroyed and it will face large risks in relationship with local communities and government; these will ultimately reduce share value and profitability of customers.

According to international studies, the successful companies have employees who have high social responsibility, loyalty, motivation, and performance. The managers are motivated to consider social responsibility due to brand reputation and management, risk management, better access to capital, innovation and learning, savings in costs and operations efficiency, competitiveness, market penetration, social permits for work continuity, better communication with governmental officials, continuous improvement, and organizational improvement; these all have made the CSR to be an important issue in today's management literature. In this context,



this study aims to describe the content of companies sustainable development management from social and ecological perspective and also explain the theoretical principles. However, the research questions are:

- 1) Whether the research and development talents impact significantly on innovation capability of company?
- 2) Whether the research and development technology impacts significantly on innovation capability of company?

Research literature

In a study entitled (The model of service value creation to evaluate the service innovation capability in small and medium businesses), Zolfaqar and Nada (2015) showed that the small and medium businesses need service innovation for survival and value creation. The small and medium-sized businesses should constantly improve their services and maintain their competitive advantages. The analysis of experimental data showed that there was strong positive correlation between service innovation capability and value creation capability of small and medium businesses (strategic capabilities, management capabilities, operational capabilities, and adaptability).

Ong and Lin (2015) examined the relationship between security, risk, trust, organizational sustainability, and green technology. The data were collected from three universities in Taiwan (n= 188 students). The findings showed that the perceived security is an important predictor of perceived risk and trust. In addition, the perceived security impacted directly and indirectly on compliance.

Peikari et al (2014) examined factors influencing the perceived electronic security of organizational sustainability using path analysis method. The findings showed that the technical protection had positive and significant impact on perceived security. The website design had also positive and significant impact on technical protection. Also, the external assurance impacted on inner assurance. There was no significant relationship between external and internal assurance and perceived security.

Thornhill (2012) studied the impact of innovation on performance of 48 manufacturing companies in Canada. The findings showed that the industries with high dynamism have more innovation; the interaction of knowledge, innovation, and industry dynamism affects corporate performance.

Nasri and Charfeddine (2012) investigated the factors affecting compliance with electronic banking based on technology adoption model and organizational sustainability-based planned behavior theory. They studied 284 Tanzanian citizens. The structural equation model was used for analyzing the data. The findings showed that the perceived usefulness and easy of use, privacy and security, self-efficacy, government support, IT support, attitude, and mental norm impact on using electronic banking services.

Methodology

This was applied descriptive cross sectional survey research. A researcher-made questionnaire was used for collecting the data. The population consisted of all employees and managers of companies which are located in industrial city 1 in Zanjan (N= 275). Using Cochran formula, 160 subjects were selected as sample.

$$n = \frac{275 \times 1.96^2 (0.5) (0.5)}{(275)(0.05)^2 + 1.96^2 (0.5) (0.5)} = 160.4 \cong 160$$

The SPSS and AMOS software were used to estimate the model.

Table 1: Cronbach's alpha

All variables	Innovation capability	Sustainable Development	Technology of research and development	R & D talents	Corporate Social Responsibility	
0.719	0.784	0.793	0.729	0.700	0.731	Cronbach's alpha

According to above table, the Cronbach's alpha of questionnaire is above 0.7; therefore, the reliability of questionnaire is confirmed. The conceptual model of study is provided considering the base article, literature, and theoretical foundation.

Findings

Demographic characteristics of participants

Gender:

The frequency of participants in terms of gender is provided in following table.

Table 2: Frequency of participants in terms of gender

Gender		
	Frequency	Percentage
Male	113	71
Female	47	29
Total	160	100

According to above table, 71 percent are male and 29 percent were female.

Age:

The frequency of participants in terms of age is provided in table below in 4 groups.

Table 3: Frequency of participants in terms of age

Age class	Frequency	Percentage
Less than 30 years	26	17
Between 31 and 40 years	38	23
Between 41 and 50 years	56	35
More than 50 years	40	25
total	160	100

According to above table, the highest age distribution is for managers 41 to 50 years old and the lowest age distribution is for workers less than 30 years old.

Inferential findings

First hypothesis:

H0: The research and development talents have no significant impact on innovation capability.

H1: The research and development talents have significant impact on innovation capability.

According to findings, the correlation coefficient of research and development talents and innovation capability is shown in table below.

Table 4: Correlation coefficient of first hypothesis

Variables	Dependent variable
Independent variable	Spearman correlation
	Significance level

According to table above, the correlation coefficient between research and development talents and innovation capability is 0.763 and the significant level is less than 0.05; there is a significant and positive correlation between research and development talents and innovation capability. Therefore, the first hypothesis is confirmed.

Regression analysis of first hypothesis:

Table 5: Regression of first hypothesis

Dependent variable	Coefficient of determination	Confidence level	Regression coefficient	
Innovation capability	0.622	0.000	0.992	R & D talents
		0.000	0.697	Constant number

The regression coefficient of research and development talents and innovation capability is equal to 0.622; this indicates that 62.2 percent of variance in innovation capability is explained by research and development talents. Also, the research and development talents are suitable variable for innovation capability. The regression equation of first hypothesis may be written as follow:





$$\text{Innovation capability} = 0.992 * (\text{research and development talents}) + 0.697$$

Second hypothesis:

H0: The research and development technology has no significant impact on innovation capability.

H1: The research and development technology has significant impact on innovation capability.

According to findings, the correlation coefficient of research and development technology and innovation capability is shown in table below.

Table 6: Correlation coefficient of second hypothesis

Variables		Dependent
Independent variable	Spearman correlation	0.386
	Significance level	

According to table above, the correlation coefficient between research and development technology and innovation capability is 0.386 and the significant level is less than 0.05; there is a significant and positive correlation between research and development technology and innovation capability. Therefore, the second hypothesis is confirmed.

Regression analysis of second hypothesis:

Table 7: Regression of second hypothesis

Dependent variable	Coefficient of determination	Confidence level	Regression coefficient	
Innovation capability	0.165	0.000	415,0	Technology of research and development
		0.000	1.863	Constant number

The regression coefficient of research and development technology and innovation capability is equal to 0.165; this indicates that 16.5 percent of variance in innovation capability is explained by research and development technology. Also, the research and development technology is suitable variable for innovation capability. The regression equation of second hypothesis may be written as follow:

$$\text{Innovation capability} = 0.415 * (\text{research and development technology}) + 1.853$$

Conclusion and recommendations

First hypothesis: The research and development talents have significant impact on innovation capability.

According to findings, the correlation coefficient between research and development talents and innovation capability was 0.763 and the significant level was less than 0.05; there is a significant and positive correlation between research and development talents and innovation capability. Therefore, the first hypothesis is confirmed.

The regression coefficient of research and development talents and innovation capability is equal to 0.622; this indicates that 62.2 percent of variance in innovation capability is explained by research and development talents. Also, the research and development talents are suitable variable for innovation capability.

This was consistent with research results of Mirfakhredini et al (2012), Bodaghii (2010), Nasri and Charfeddine (2012), Sharma and Singh (2011), and Lie and Frederick (2015). The managers use their capabilities in R & D talents, innovation capability, companies sustainable development, service innovation, and market performance.

Second hypothesis: The research and development technology has significant impact on innovation capability.

According to findings, the correlation coefficient between research and development technology and innovation capability was 0.386 and the significant level was less than 0.05; there is a significant and positive correlation between research and development technology and innovation capability. Therefore, the second hypothesis is confirmed.

The regression coefficient of research and development technology and innovation capability is equal to 0.165; this indicates that 16.5 percent of variance in innovation capability is explained by research and development technology. Also, the research and development technology is suitable variable for innovation capability.



This was consistent with research results of Safari and Bashluni (2014), JafariSangari et al (2014), Zarei (2014), Mazhari et al (2014), I-Bashir et al (2008), Mac Donuf (2009), Sharma and Singh (2011), Daniel et al. (2011), and Lie and Frederick (2015). This is rooted in innovation capability, marketing emphasis, social responsibility, and innovative performance.

According to research hypotheses and findings, the following recommendations are provided:

- The managers should make appropriate decisions on appointments of organizational positions and employ those who have talent for research and development to impact positively on organizational innovation.
- The people who are familiar with research and development technology to be employed to use their skills in creation of organizational innovation.
- Since the innovation is important in organization, the factors of organization s sustainable development should be investigated.

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