

# Effects of Entrepreneurial Orientation on Innovation Capability and Performance of Information Technology Firms in India

## Abstract

In this study, we investigate the effects of entrepreneurial orientation and innovation capability on the performance of Information Technology (IT) firms in India. Partial Least Square (PLS) – Structural Equation Modelling (SEM) analysis was used to test the effects of the entrepreneurial orientation on innovation capability and firm performance. The results indicated that innovation capability plays an influential role on the entrepreneurial orientation, and also has a direct effect on firm performance. It specifically implies that entrepreneurial orientation plays an important role in enhancing innovation capability and performance of IT firms in India.

**Keywords:** Entrepreneurial Orientation, Innovation Capability, IT, Firm Performance and PLS-SEM

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## Introduction

Firms' innovation capability and performance is influenced by several factors such as, market orientation and technological orientation etc. In this study, the authors have focussed only to measure the effect of innovation capability on entrepreneurial orientation and firm performance. The significance of entrepreneurial orientation to the existence and performance of firms has been acknowledged in the entrepreneurship literature (Miller, 1983; Lumpkin and Dess, 2001; Wiklund, 1999; Wiklund & Shepherd, 2005; Zahra & Covin, 1995; Zahra & Garvis, 2000). This study extends the existing studies on reaping the value of a high technology firm's innovation capability in a transition economy. It exhibits the antecedent role of firm's entrepreneurial orientation in strengthening its innovating capability to ensuing corporate growth and sustainability. This study contributes in understanding the impact of firm's innovation capability on entrepreneurial orientation, and its sustainable business performance in the context of high technology Information Technology (IT) firms in India.

## Objective of The Study

The purpose of this article is to examine the role of entrepreneurial orientation on enhancement of innovation capability and performance of firms relating to high information technology in India.

## Review of Literature

The modern business environment is an environment where the pace of change is fast, product and business model lifecycles are shortened, the future profit streams from existing operations are uncertain and businesses need to constantly seek out new opportunities. Therefore, firms may benefit from adopting an EO, i.e. being innovative, risk taking and proactive (Rauch et al., 2009). Many studies have investigated the relationship between entrepreneurial orientation and firm-level performance, such as firm innovation (Wiklund & Shepherd, 2003), intra and extra-industry networks (Stam & Elfring, 2008) and financial performance (Wang, Hult, Ketchen Jr., Ahmed, 2009). However, assessing the magnitude of this relationship has yielded mixed results. Some studies report lower correlations or even no significant relationship between EO and performance (Covin, Slevin & Schultz, 1994; Lumpkin & Dess, 2001). These findings convey the important message that simply examining the direct relationship between EO and performance provides an incomplete picture of this domain. A few recent studies have shifted some focus to the indirect relationship between EO and performance. Catherine and Wang (2008) propose that learning orientation is one of the missing links in the EO-performance relationship. Li et al. (2009) use survey data to examine the mediating role of the knowledge creation process. Other studies focus

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on the role of exploitative and exploratory capabilities in the relationship of EO and performance (Lisboa, Skarmeas & Lages, 2011). As a result, researchers began to seek internal and external factors that mediate the relationship between EO and firm performance rather than measuring the direct link between them (e.g. Lumpkin and Dess, 1996; Zahra and Garvis, 2000; Lumpkin and Dess, 2001; Li, Huang and Tsai, 2008; Wang, 2008; Alegra and Chiva, 2013). However, the effect of entrepreneurial orientation has not been yet measured in increasing the innovation capabilities and firm performance. Therefore, this study addresses the role of entrepreneurial orientation and innovation capability on the performance of IT firms.

## Concepts And Hypotheses

### Entrepreneurial Orientation and Firm Performance

In an environment of rapid change and shortened product and business model lifecycles, the future profit streams from existing operations are uncertain and businesses need to constantly seek out new opportunities. Therefore, firms may benefit from adopting an EO. Such firms innovate frequently while taking risks in their product-market strategies (Miller & Friesen, 1982). Efforts to anticipate demand and aggressively position new product/service offerings often result in strong performance (Ireland, Hitt, & Sirmon, 2003). Thus, conceptual arguments suggest that EO leads to higher performance.

#### Hypothesis 1

Entrepreneurial Orientation has a positive effect on firm performance.

### Entrepreneurial Orientation and Innovation Capability

For firms that are committed to providing superior customer value, innovation seems to be an inherent aspect of doing business simply because the

focus on satisfying customers requires the firm to respond to anticipated changes in customers' needs, wants, and/or preferences for a market offer. Entrepreneurial oriented firms need to constantly monitor the dynamic and competitive environment to get into more undertaking risky projects where they may come up with more proactive innovations which in turn lead to superior performance. This enables IT firms to focus more on its innovation capabilities. Therefore we suggest the following hypothesis:

#### Hypothesis 2

Entrepreneurial Orientation has a positive effect on innovation capability.

### Innovation Capability and Firm Performance

Hult et al. (2004) rationalise innovativeness as a firm's capacity to introduce new processes, products, or ideas in the organisation. Burns and Stalker (1977) conceptualise innovativeness as the capacity to innovate. Therefore we can argue that firms' ability to create and sustain superior performance is strongly related to developing innovation capabilities.

#### Hypothesis 3

Entrepreneurial Orientation has a positive effect on innovation capability.

## Research Design

### Sample and data collection

Data collection was carried out by using a sample design that follows the principal of convenience sampling. The key informant in this study is the top management, consultants, and other senior level management executives of Information Technology (IT) firms. We employed a questionnaire survey approach to collect data, and all items required five-point likert-style responses ranged from 1="strongly disagree," through 3="neutral," to 5="strongly agree."

**Table I: Demographic Details of Information Technology Firms**

	Category	No. of Firms
Industry	Software Service Firms	189
	Business Process Outsourcing Firms	28
	Telecommunications Firms	24
	Electronic Component Firms	10
	Internet Equipment Firms	9
	Computer and Peripheral Equipment Firms	9
	Semiconductor Firms	6
	<b>Aggregate</b>	<b>275</b>
Years Since Established	3 years and fewer	17
	Over 3 years to 5 years	9
	Over 5 years to 10 years	31
	Over 10 years to 15 years	25
	Over 15 years to 20 years	38
	Over 20 years	155
	<b>Aggregate</b>	<b>275</b>
Size of Firms (No. of employees)	100 and fewer	34
	101 to 500	19
	501 to 1000	10
	1001 to 2000	12
	2001 to 3000	3
	Over 3000	197
	<b>Aggregate</b>	<b>275</b>

The research in this study was conducted by employing a quantitative technique. The convenient resource for this study is the primary resource. An online link of questionnaire was sent to 550 personalized e-mail addresses requesting their participation. During data collection, 124 declined participation or indicated a lack of time, resulting in an effective sampling frame of n=426. Out of which only 293 responses were collected but 18 were not usable because they were incomplete. Thus, the final usable sample contained 275 responses yielding an effective response rate of 64.5% (275/426).

**Statistical Tools**

Structural equation modelling was used to assess the research model. The partial-leastsquares(PLS) method was chosen for its robustness, as it does not require a large sample or normally distributed multivariate data in comparison with other methods such as LISREL (Fornell and Bookstein, 1982). As recommended by Anderson and Gerbing(1988), the data were analyzed in two steps. First, the validity of the research constructs was assessed from a separate estimation of the measurement model by confirmatory factor analyses. Second, the research model was tested by the simultaneous estimation of the measurement and theoretical (or structural) models.

**Analyses, Results And Discussions**

**Assessment of the Measurement Model**

All constructs drew on a reflective measurement model in the study, because the indicators of each constructs are correlated and interchangeable (Hair et al., 2013). The study conducted Stage 1 by assessing reliability and validity of constructs.

**Reliability**

Reliability of the multi-item scale for each dimension was measured using Cronbach alphas and composite reliabilities measures. Both measures of reliability were above the recommended minimum standard of 0.60 (Bagozzi & Yi, 1988; Baker, Parasuraman, Grewal, & Voss, 2002; Nunnally, 1978).

**Table II. Reliability of Constructs**

	<b>Cronbach Alpha</b>	<b>Composite Reliability</b>
Entrepreneurial Orientation	0.908	0.923
Innovation Capability	0.963	0.967
Firm Performance	0.959	0.965

**Validity**

The validity was assessed in two ways (Baker et al., 2002). First, the confidence interval for each pairwise correlation estimate (i.e., ±two standard errors) should not include 1 (Anderson & Gerbing, 1988). This condition was satisfied for all pairwise correlations in three measurement models. Second, for every construct, the percentage of variance extracted should exceed the construct's shared variance with every other construct (i.e., the square of the correlation) (Fornell & Larcker, 1981; Hult, Hurley, Giunipero, & Nichols, 2000). As may be seen

from Table II, this condition for discriminant validity is also satisfied for all the constructs.

**Table III. Validity of Constructs**

	<b>Entrepreneurial Orientation</b>	<b>Innovation Capability</b>	<b>Firm Performance</b>
Entrepreneurial Orientation	<b>0.929</b>		
Innovation Capability	0.712	<b>0.865</b>	
Firm Performance	0.623	0.761	<b>0.881</b>

**The Structural Model and Hypothesis Testing**

PLS was also used to assess the structural model, specifically to estimate the path coefficients and R2 values. Using a bootstrapping technique, we investigated the significance of the path coefficients in the structural model by calculating t-statistics and P values for the hypothesized relationships. The PLS results of this hypothesis testing are shown in Figure 2 and Table IV.

**Collinearity**

Variance Inflation Factor (VIF) values were used to examine the collinearity. The result showed that VIF values ranged between 1.426 and 2.324, indicating that the results were not negatively affected by collinearity as they were all < 5 (Hair et al., 2013). Coefficient of determination (R<sup>2</sup>)

The R<sup>2</sup> value of each endogenous construct is a measure of the variance explained in each endogenous construct and the model's predictive accuracy. According to Hair et al. (2013) and Sarstedt et al. (2014), R<sup>2</sup> values of 0.75, 0.50 and 0.25 may be considered substantial, moderate and weak, respectively. Results for innovation capability and firm performance had moderate R<sup>2</sup> values of 0.578, and 0.642, respectively. However, considering the possibility of extrinsic factors and alternatives, their R<sup>2</sup> values are satisfactory.

**The Path Coefficients**

Fig. 1 shows the results from the bootstrapping procedure (264 cases, 5000 samples, no sign changes option), and Table 3 presents the direct and total effects of the innovation capabilities on the firm performance. The R2 values for innovation capability and firm performance indicated that entrepreneurial orientation explained 64.2% and 57.8% of their variance. Although these percentages were relatively moderate, bootstrapping results revealed positive and significant effect of entrepreneurial orientation on innovation capability and firm performance. Paths between constructs represent individual hypotheses, and each was assessed for statistical significance of the path coefficients. This study tested hypothesized relationships with a full model, and the PLS analysis of this model produced t statistics. The analysis also provided support for the first three study's hypotheses which can be seen in following table IV.

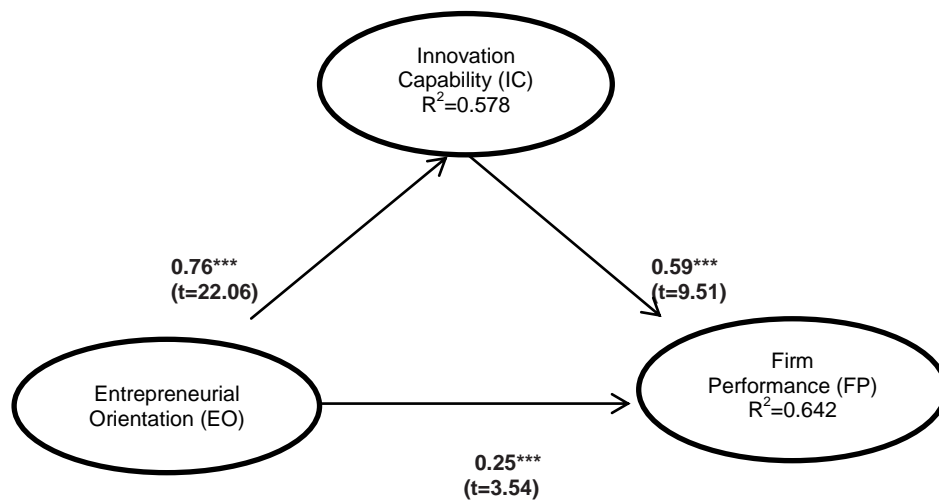
**Table IV: Significance Testing Results of the Structural Model Path Coefficients**

	Path Coefficients	Standard Errors	T Statistics	Significance <sup>a</sup> (p<0.05)	Results
Entrepreneurial Orientation->Firm Performance	0.25	0.07	3.54	Yes	Supported
Entrepreneurial Orientation->Innovation Capability	0.76	0.03	22.06	Yes	Supported
Innovation Capability-> Firm Performance	0.59	0.06	9.51	Yes	Supported

As hypothesized, there is a positive relationship between entrepreneurial orientation and firm performance ( $\beta_{11}=0.25$ ,  $t=3.54$ ). Therefore, H1 is supported. Results uphold the proposition that the two concepts are indeed related and, therefore, support the conclusions, which postulate that entrepreneurial orientation is important to enhance firm performance. A positive relationship between entrepreneurial orientation and innovation capability is established ( $\beta_{21}=0.76$ ,  $t=22.06$ ). Therefore, H2 is supported. As scholars have postulated, perhaps the firms' capacity to innovate may be better served by adopting appropriate entrepreneurial orientation and innovation capability. As predicted, there is a significantly positive relationship between innovation capability and firm performance ( $\beta_{12}=0.59$ ,  $t=9.51$ ). Therefore,

H3 is supported. The finding may add to the understanding that innovation capability is indeed necessary and may be linked to performance. After interpreting the results of a path model, we tested the significance of all structural model relationships using t values, p values and bootstrapping confidence intervals. The hypotheses were examined using PLS 3. Paths between constructs represent individual hypotheses, and each was assessed for statistical significance of the path coefficients. This study tested hypothesized relationships with a full model, and the PLS analysis of this model produced t statistics. The analysis also provided support for the hypotheses which can be seen in following Fig.1.

**Fig. 1 PLS Path Coefficients and bootstrapping Statistics**



**Conclusion**

The study concludes that entrepreneurial orientation has a positive impact on innovation capability. This finding supports the idea of companies that build a strategy based on entrepreneurial-oriented approach other than profit oriented view will contribute to their long term sustainability since it focuses on gaining competitive edge on their contenders. The present study also concludes that innovation capability has a positive impact on firm performance and further reveals that innovation capability plays a mediating role through which entrepreneurial orientation is influenced which further improves the firm performance.

**Suggestions**

From a practical point of view, the finding of the study suggests that managers should be aware of the importance of innovation capability in the link of entrepreneurial orientation and firm performance. For further researches the analysis also can be expanded in taking into account of these considerations, the generality of this study's results is constrained by the high technology in IT setting. The data are cross-sectional, longitudinal data could be helpful to test the true causality of our model.

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