

A Research on Organizational Capability and Their Strategic Impact on Manufacturing Industry

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Abstract - Organizational capabilities can be viewed as the organizational context in which the organization members work in order to contribute to growth, service or other organizational goals. The research seeks to achieve in-depth understanding of impact of various organization capabilities on firm performance. Quantitative survey method was adopted for research and data was collected from 41 small and medium scale manufacturing organizations of Punjab. This paper explores how R&D capabilities, human resource capabilities, process innovation capabilities, product innovation capabilities and manufacturing capabilities influence the performance of organizations. Descriptive analysis has been derived from the study, followed by regression analysis, pearson correlation analysis, cronbach alpha and analytical hierarchy process (AHP). The findings suggest that there is significant and positive relationship between organization capabilities and firm performance. Firm performance is measure of two variables namely sales performance and financial performance. The results reveal that R&D capabilities and process innovation capabilities play vital role in achieving better sales performance whereas better financial performance can be achieved from process innovation capabilities and product innovation capabilities.

Keywords: Manufacturing industries, Punjab, Technological capabilities, Innovative capabilities, Organization capabilities, Dynamic capabilities, Firm performance

I. INTRODUCTION

The analysis of organizational learning has become an increasingly important study area over recent years. Organizational learning is understood as dynamic capability that shapes the firms strategic flexibility and competitive strategy to improve customer, financial and market related performance (Santos-Vijande *et al.*, 2012). The study indicates the manager's improvement in understanding the external market and the ability to react more rapidly to new market requirements. There is a deep relationship between innovation and firm performance (Atalay *et al.*, 2013). Innovation is an important source of competitive advantage in increasingly changing environment. It allows the firms to grow more quickly, be more efficient and to be more profitable than other non-innovators. A firm's organizational capabilities, both internally and externally oriented, are essential for increasing customer value creation and to identify the combinations of these organizational capabilities to analyze the way that will allow the creation of good customer value (Martelo *et al.*, 2013). Organizational learning capability has the measurement scale that identifies the elements that form

learning capability which highlights its complex and multidimensional nature. The scale provided the information that could be used by those managers who wish to improve learning capability in their firms. The scale can also be used for analyzing the influence of learning on firm's performance (Jerez-Gomez *et al.*, 2004).

Organizational learning is the capability in an organization to improve its performance which is based on experience. It increases the knowledge that is created by individuals in an organized way and changes this knowledge into an organization knowledge system and the results showed that transformational leadership influences organizational performance positively through organizational learning and innovation and organizational innovation affects organizational performance positively (Garcia- Morales *et al.*, 2012).

An organization can adapt to the environment mainly within the limits of its resources and capabilities and these are dynamic capabilities that emphasize the need for the firms to change their resource and capability base to prevent them from observing external environmental changes and adapting to them (Makkonen *et al.*, 2013).

Organizational innovation favors the development of technological innovation capabilities and both organizational innovation and technological capabilities for products and processes can lead to superior firm performance (Caminson and Lopez, 2012). The externally available information affects all innovation capabilities of the firm, while external expert organizations affect only the firm's R&D and resource allocation capabilities (Yam *et al.*, 2011).

There is a relationship between innovation and performance that asserts a positive relationship between organizational learning and both performance and innovation. Both of these contribute positively to business performance and organizational learning affects innovation (Jimenez-Jimnaz and Sanz-Valle, 2011).

The aim of this paper is to contribute to firm performance literature by identifying different dimensions of organization capabilities, and to analyze empirically whether these capabilities have any impact on the performance of the organization.

The paper is organized as follows: first, the theoretical context in which this paper is based is presented; second, existing literature on organization capabilities; third, based on the outcome of empirical analysis, a regression model has been developed; and finally, the implications of the study have been discussed and the limitations of the proposed model and research perspectives have been proposed.

II. LITERATURE REVIEW

The literature has been reviewed on the concept of organization capabilities, dynamic capabilities and interplay of relationships between different capabilities to achieve better firm performance. The methodology to be used for carrying out the research has also been reviewed and presented.

A. Capability Defined

The concept of organization capabilities is ambiguous. A basic assumption of capability view is that organizations have various ways of performing different things and thus dealing with the problems of organization that show strong elements of continuity (Dosi, Faillo and Marengo, 2003).

Organization capabilities have been defined in number of ways. Organization capabilities employs three different capabilities which include motivation to take particular action, ability to take the action and in all understanding the competitive environment among all the organization (Luo *et al.*, 2012). From the review of literature on capabilities, research has been done in three functional areas of the firm which include operations, customer service and product development. Operational capability is the ability of the firm to provide the customers with the products on which we can rely and thus provide them services delivered at competitive prices. Customer service capability is the ability of the organization to understand the demands which are occurring in different markets. Product development capability is the capability to provide good quality products by focusing on innovation.

Gomez *et al.* (2005) classified organization capabilities in four dimensions: Knowledge transfer and integration, System perspective, Openness and experimentation and Managerial commitment. All these have multidimensional nature. Caminson and Lopez (2011) considered five dimensions which have direct relation with each other and thus include: Organization innovation, Market innovation, Organizational memory, Learning Capabilities and sustained competitive advantage which further includes three variables: size, age and environmental uncertainty.

B. Organizational Capability

The concept of organization capability has gained significant importance in recent times. Zoiopoulos (2013) proposed the concept of strategic and functional capabilities

of organizations. Strategic capability is the ability of firm to enter the growing markets more quickly and leave the one which are declining more rapidly than its competitors. Yamin *et al.* (1997) identified three key areas to improve the organization capabilities. These include organizational performance, organizational innovation and competitive strategy in firms. Organizational performance depends on the ability of the firm to achieve competitive advantage. Organizational innovation has three areas which include administrative innovation, product innovation and process innovation. Organizational performance has four main aspects named as leverage, liquidity, activity and return on investment (ROI).

Chiu *et al.* (2008) find that the consideration of a firm's complementary assets can help to explain the relationship between technological diversification and firm performance. More specifically, no single perspective on a firm works at all times and in all situations. Su and Chen (2013) from their field research revealed the relationship between conceptual learning mechanisms and operational learning and their effect on plant performance. The effects of individualism and collectivism culture type are the main dimensions of learning mechanisms. The concept of dynamic capability has also been considered. The term dynamic explains the capacity to update and renew for the change that occurs in the environment and the term capability tells the role of internal and external competencies of the firm (Zollo and Winter, 2002). Organizations add knowledge and learn through processing data and making sense about the events that occurred in their environment (Huber, 1991). They concluded that both operational learning and conceptual learning are closely related to plant performance.

Koutfteros *et al.* (2014) concluded that performance among several fields such as quality, delivery and product innovation is very much necessary for the well being of the organization. They suggested that manufacturing practices play a very important role in finding out the role of product development characteristics. They considered the concept of dynamic capabilities in this context. Organization capabilities thus enable the firms to deal efficiently in a firm-specific way with key organization problems (Dosi, Nelson and winter, 2000).

III. DESIGN OF STUDY

This section involves the overall design of study and the methodology adopted for carrying out the research work. The research has been carried out in the small/medium scale manufacturing organizations in Punjab. The primary focus of this study was the influence of external environment on a firm's value creating strategies and in turn on firm performance. *Small scale industries* are those industries in which the investment in fixed assets in plant & machinery, whether held on ownership term or lease or hire purchase is more than Rs. 25 lakhs but does not exceed Rs. 1 Crore and a medium scale enterprise is an enterprise where the

investment in equipment is more than Rs. 1 crore but does not exceed Rs. 5 crore.

A. Survey Questionnaire and Respondent Profile

The manufacturing industries in Punjab are an emergent sector and thus have the ability to increase the development of the country economically. For effectively conducting the survey, the exploits of the manufacturing organizations regarding organization capabilities has been explored through plant visits, interviews/discussions, investigation Of OC initiatives deployed over the period of time and close analysis of achieve made through OC initiatives. This thesis has focused on evaluating exploits of entrepreneurs of Punjab and would highlight the contributions of OC in realizing the overall organization goals and objectives. The steps to be followed in the dissertation have been elaborated in figure 1.

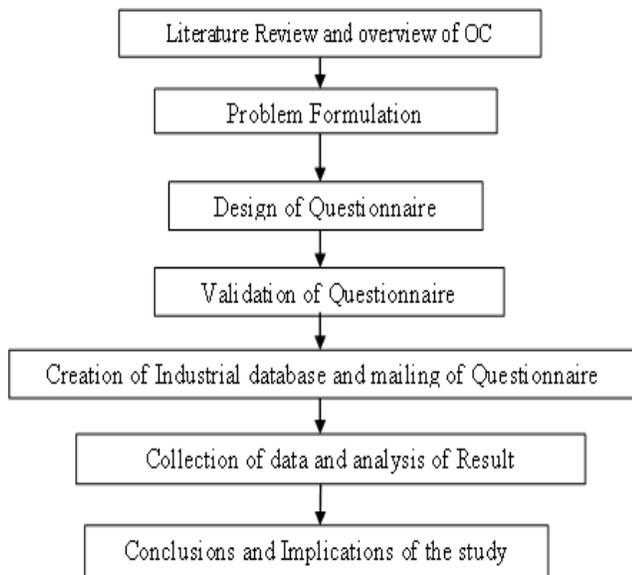


Fig. 1 Methodology adopted for the study

In this study, number of manufacturing organizations was surveyed, to assess the impact of organization capabilities on firm performance in the manufacturing industries of Punjab. Survey of medium and small scale manufacturing industries was carried out through a specially designed questionnaire for understanding and assessing the prevailing situations.

For effectively conducting the survey, the questionnaire was designed through extensive literature review and validated through peer review from academics, consultants, and senior managers from the industry. The questions framed were based on five-point likert scale ranging from 1 to 5 designed to generate meaningful statistical measurements by obtaining meaningful quantitative answers to the questions.

Most of the respondents to ‘OC Questionnaire’ belonged to the top class of the management executives that included several Vice Presidents, Head-Operations, Head-Quality Assurance, General Managers (GM), Heads of Maintenance, Head-Process Engineering, Chief Managers etc. The responses thus received have been compiled and analyzed critically to ascertain the performance of the industries of Punjab regarding various organization capability issues.

B. Tests of Reliability and Validity of Data

Test of reliability on a measurement instrument has been carried out to determine its ability to yield consistent measurements. Cronbach alpha (α) is the basic formula for determining the reliability based on internal consistency. Therefore, the Cronbach’s α for various organization capabilities and its dimensions have been evaluated to ascertain the reliability of the input and output data collected through the questionnaire. The value of Cronbach’s α for various variables has been shown in Table I. The Cronbach’s α values for all the input and output categories, in excess of 0.6 indicates the significantly high reliability of data for various input and output categories.

A seven factor correlated model representing each of the elements has been used to examine discriminate validity. The within-group and between-group variances for all the constructs are contained in table. The diagonal cells contain the within-group variances, the off-diagonal cells in the lower triangle contain the between-group variances, and the off-diagonal cells in the upper triangle represent correlations among the constructs. As can be seen in the table II, the within-group variances of any two constructs exceed the variance between those two constructs, thereby supporting discriminate validity.

C. Analysis and Results

From the extensive literature survey and critical examination of medium and small scale manufacturing industry, it has been found out that few organizations have made reasonably significant interventions for achieving organization capabilities, while rest of the organizations have yet to made a significant head-start regarding implementation of these drives.

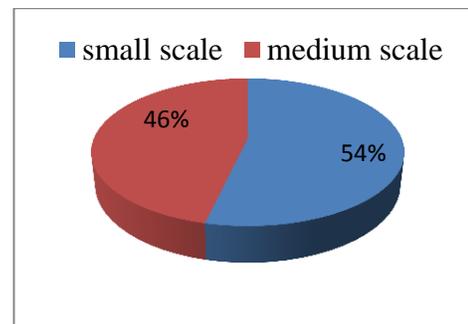


Fig. 2 Breakdown of Responses

TABLE I BREAKUP OF RESPONSES OBTAINED THROUGH QUESTIONNAIRE

Category	Number of Respondents	Percentage of respondents
Industry type		
Medium Scale	19	46.3%
Small Scale	22	53.6%
Turnover in rupees		
Less than 25 Lakhs	5	12%
26-50 Lakhs	5	12%
51-75 Lakhs	7	17%
76-100 Lakhs	5	12%
>100 Lakhs	19	47%
Number of employees		
1-25	17	42%
26-50	4	10%
51-75	3	8%
>75	16	40%
Production Type		
Continous	13	32%
Mass	2	5%
Batch	5	12%
Job Order	21	51%
Market Share		
<10%	25	61%
10-20%	7	17%
21-30%	5	12%
31-40%	0	0%
>40	4	10%

TABLE II CRONBACH'S ALPHA FOR VARIOUS SEGMENTS OF THE QUESTIONNAIRE

S. No.	Construct	Abbreviation	Cronbach Alpha
1	R&D Capability	RDC	0.986
2	Human Resource Capability	HRC	0.918
3	Product Innovation Capability	PDIC	0.912
4	Process Innovation Capability	PIC	0.923
5	Manufacturing Capability	MC	0.916
6	Sales Performance	SP	0.947
7	Financial Performance	FP	0.895

In the present study, the target organizations were randomly selected that have made significant investments in upgrading their existing technology, improving R&D capabilities, human resource capabilities and thus developing new products. The responses received from

these organizations have been compiled for analyzing the performance of manufacturing organizations.

In order to establish the relationship among various variables selected for the study (dependent and independent variables), bivariate correlation and multiple regression have been used. The correlations have been worked out to find the significant factors contributing to achieve better firm performance in manufacturing organizations. Only those pairs with pearson correlation greater than 40 percent or 1 percent level of significance are considered having strong correlation. The objective has been to extract those factors, which are significantly associated with organization capability dimensions. The notations used and their meanings are given below:

r - Pearson correlation coefficient

β - Regression coefficient (beta coefficient)

TABLE III DISCRIMINATE VALIDITY TESTING AND PEARSON CORRELATION MATRIX

	RDC	HRC	PDIC	PIC	MC	SP	FP
RDC	1	.877* *	.773* *	.795* *	.741* *	.831* *	.769* *
HRC	.877* *	1	.731* *	.867* *	.804* *	.825* *	.774* *
PDI C	.773* *	.731* *	1	.697* *	.712* *	.741* *	.782* *
PIC	.795* *	.867* *	.697* *	1	.904* *	.848* *	.852* *
MC	.741* *	.804* *	.712* *	.904* *	1	.770* *	.839* *
SP	.831* *	.825* *	.741* *	.848* *	.770* *	1	.877* *
FP	.769* *	.774* *	.782* *	.852* *	.839* *	.877* *	1

Note: ** Correlation is significant at the 0.01 levels

As an initial step, the pearson correlations values have been calculated to find the level of inter correlation among the various dimensions of organization capabilities. The correlation coefficients (r) are found to be high and significant at $p = 0.01$ significance level in most of the cases. This indicates that most of the organization capability variables are significantly related to various other dimensions of organization capability. The correlation (r) values through exploratory method using SPSS 22 are shown in table II.

The correlation values indicate a strong correlation between R&D capabilities with sales performance (0.831**), process innovation capability (0.795**) and financial performance (0.769**). Also the product innovation capabilities have high correlation with financial performance (0.782**), whereas process innovation capability has significant correlation with manufacturing capability (0.904**). Sales performance has also shown strong correlation with financial performance (0.877**).

The results of stepwise regression analysis have been depicted in table IV along with corresponding values of R^2 , p values and F values. The results for sales

performance show that the tolerance value for all the significant factors is greater than 0.360 (1-0.599), indicating that there is no problem of multicollinearity (overlap between dependent variables). Similarly for sales performance the value of multiple R is 0.887 ($R^2 = 0.786$) and the adjusted R^2 is 0.775, leading to the connotation that 77.5% of the variance in sales performance can be predicted from RDC, PIC, PDIC, MC and HRC combined. As the

results indicate that, only process innovation capabilities ($p < 0.01$) and research and development capabilities ($p < 0.01$) are statistically significant and thus play a major role in achieving sales performance. The role of PIC ($p < 0.01$) and PDIC ($p < 0.01$) have been found to be significant in case of financial performance. The tolerance values for these factors is greater than 0.510.

TABLE IV RESULTS OF MULTIPLE REGRESSION ANALYSIS

Capability Dimension	Significant Factor	Beta value	t- value	p- value	R/R ² value	Adjusted R ²	F value
SP	PIC	0.511	4.127	0.000	0.887/ 0.786	0.775	69.836
	RDC	0.425	3.429	0.001			
FP	PIC	0.598	5.830	0.000	0.892/ 0.795	0.784	73.628
	PDIC	0.365	3.560	0.001			

IV. CONCLUSIONS

Based on analysis and interpretation of the data obtained on each issue identified at the beginning of the research, it has been observed that organization capabilities have been widely employed as a critical component in manufacturing organizations. The issue is, however, to harbor such practices for the growth and benefit of organization thus obtaining better firm performance. Firm performance is measure of two variables namely Sales performance and Financial performance. The study therefore recommends that Research and development capabilities and process innovation capabilities play important role in achieving better sales performance whereas better financial performance can be achieved from process innovation capabilities and product innovation capabilities.

In this paper, the impact of organization capabilities on firm performance in medium and small scale manufacturing organizations of Punjab has been studied. The generality of results obtained from this study can also be extended to large scale organizations. Secondly, the scope of this study was limited to manufacturing industry only and thus can be extended to other categories of industry also. Finally, the item measures identified for various constructs have been considered to be equally important in the study, however in real life situations, some item measures may be more important than the others. The study can be extended by attaching appropriate weights to these item measures through qualitative techniques.

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