



## AMBIDEXTROUS CULTURE AND PRODUCT INNOVATION - A PROJECT TEAM LEVEL ANALYSIS

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### **Abstract**

*Purpose – The paper focuses on ambidextrous culture (AC) as a higher order construct comprising of seven component factors such as Organizational Bonding(OB), R&D strategy, Top Management Support (TMS), Customer Focus (CF), Organizational Learning Capability (OLC), Creative Capability (CC), Organizational Collaboration (OC). The purpose is to find the relationship between AC and product innovation.*

*Design/methodology/approach – The paper formulates a hypothesis from the literature review. The hypothesis is tested using various statistical techniques with data collected from 250 project teams in software development organizations in Kerala.*

*Findings – The findings indicate that AC has a significant impact on product innovation. Also the ambidextrous culture and product innovation in the software development organizations are found to be high.*

*Practical implications – The results of this study could be used by any manager of the IT organization concerned to improve the corporate culture to handle successful innovation projects. The results also provide companies operating in software development sector in Kerala with useful information on how their policies and actions might affect help to improvise the product innovation.*

**Keywords: Software Development Organization, Ambidextrous Culture, Product Innovation.**

### **INTRODUCTION**

Software development organizations focus on making significant investments towards innovation in product and services. They champion innovation as the key determinant to future their businesses. Smart businesses know that constant innovation is a central strategy towards future- proofing. This is to ensure competitiveness in an extremely dynamic business environment. Software development organizations assume a greater decision making role and responsibility to ensure long term role (Business Line, 2015).

The word ambidexterity is derived from the Latin word *ambos* which means “both” and *Dexter means* “right”. Thus ambidexterity is ‘right on both sides’(Simsek,2009). Organizational culture is ‘the underlying values, beliefs, and principles that serve as a foundation for an organization’s management system as well as the set of management practices and behaviors that exemplify and reinforce those basic principles’ (Denison, 1990, p. 2). It forms the informal, behavioral part of organizational Context (Denison, 1996), complementing the formal, structural component (e.g. processes and systems). Organizational culture is developed as an organization learns to cope with the dual problems of direction and flexibility as well as external adaptation and internal integration (Schein, 1990).

### **THEORETICAL BACKGROUND & RESEARCH HYPOTHESES**

*Ambidextrous culture* is conceptualized as the culture which simultaneously enhances exploitation and exploration of competences of the organization for the purpose of stimulating product innovation (Wang and Rafiq, 2012). From the various literatures on ambidexterity and the climate and culture for innovation, seven variables have been identified as constituting a higher order construct of ambidextrous culture .They are organizational bonding, shared vision, top management support, R&D initiatives, customer focus, organizational collaboration, creative capability and organizational learning capability. The authenticity of the variables for the study is ratified by twenty experts of the IT industry.

*Product innovation* is the development of new products, changes in design of established products, or use of new materials or components in the manufacture of established products (Michael White, Braczyk, Ghobadian, & Niebuhr, 1988; Jerinabi U. & Santhi P., 2012). Product innovation is nothing but the conception, development, designing and delivery of software products Product innovation as defined by (Damanpour, 1991), as new products or services introduced to meet an external user or market need. Product innovation is defined as the development of new products, changes in design of established products, or use of new materials or components in the manufacture of established products (Michael White, Braczyk, Ghobadian, & Niebuhr, 1988; Jerinabi U. & Santhi P., 2012). Product innovation is the creation and subsequent introduction of a good or service that is either new or improved on previous goods or services. This is broader than the normally accepted definition of innovation to include invention of new products which, in this context, are still considered innovative.

The research focuses on perceptions of software development professionals/project teams on product innovation as measured in terms of radical innovation, incremental innovation and speed to market.

## HYPOTHESIS OF THE STUDY

**H1: There exists relationship between ambidextrous culture and product innovation.**

## POPULATION AND SAMPLE

The population for the study consisted of the project teams in the 25 software development organizations at Ernakulam and Trivandrum in Kerala identified for the study using appropriate sampling criteria. The population size is 314. The sampling frame is the list of all project teams in the twenty five software development organizations at Ernakulam and Trivandrum in Kerala. To reflect the differences anticipated in the heterogeneity of the project team, the nature of the project undertaken and to have a full coverage of all elements of the population, it was decided to adopt a census survey. Hence it was requested to distribute the questionnaires to 314 project teams to get their responses. Out of 314 questionnaires distributed, only 264 were received. The response rate was 84%. 14 questionnaires were discarded on account of missing values. Thus the final number of utilizable responses for analysis was 250. The sample size is 250.

## DATA ANALYSIS AND FINDINGS

### Sample Profile

Project teams in software development organizations represent the sample in the study. Sample profile shows the classification of project teams based on designation and software development unit size. Table 1.1 shows classification of the project teams based on designation

**Table 1.1 Classification of the project teams based on designation**

Designation	Frequency	Percentage
Project Leaders	131	52.4
Project Managers	119	47.6
Total	250	100.0

The respondents were project managers and project leaders who were asked to indicate the designation category by selecting that designation which they belong to. Information is collected from 131 project managers and 119 project leaders which constitute 52.4% and 47.6% of total respondents. Table 1.1 shows classification of the project teams on the basis of the software development unit size

## ANALYSIS OF SOFTWARE DEVELOPMENT ORGANIZATIONS

This analysis refers to the testing of hypothesis of twenty five software development organizations.

### Regression Analysis of software development organization with 250 project teams

**Table 1.2 Descriptive Statistics- Variables included in the model**

	Mean	Median	SD	Minimum	Maximum
Product Innovation	45.63	44.00	14.04	10	80
Ambidextrous culture	130.44	130.50	29.62	68	195

**Product Innovation:** Product innovation has a mean score of 45.63 with standard deviation 14.04 and the median is 44. The minimum and maximum scores are 10 and 80 respectively.

**Ambidextrous culture:** Ambidextrous culture has a mean score of 130.44 with standard deviation 29.62 and the median is 130.5. The minimum score is 68 and the maximum score being 195.

**Table 1.3 Means, mid values and statuses**

Variables	Min-maxi.score	Mid value	Mean score	Status
Product innovation(PI)	8-80	44.00	45.63	Somewhat high
Ambidextrous culture(AC)	39- 195	117.00	130.44	Very high

In case of product innovation since the mean score (45.63) is slightly above the mid value (44.00), it is somewhat high. Ambidextrous culture is extremely high since the mean score (130.44) is much above the mid value (117.00).

**Relationship between Ambidextrous culture and Product Innovation**

The hypothesis to be tested here is,

**Hypothesis one - There exists relationship between ambidextrous culture and product innovation.**

For analyzing this relationship, correlation and simple regression tests are used. Correlation is a measure of linear relationship that quantifies the strength of the relationship between the variables, whereas regression expresses the relationship in the form of an equation. The details of correlation and regression are given below.

**Table 1.4 Model Summary**

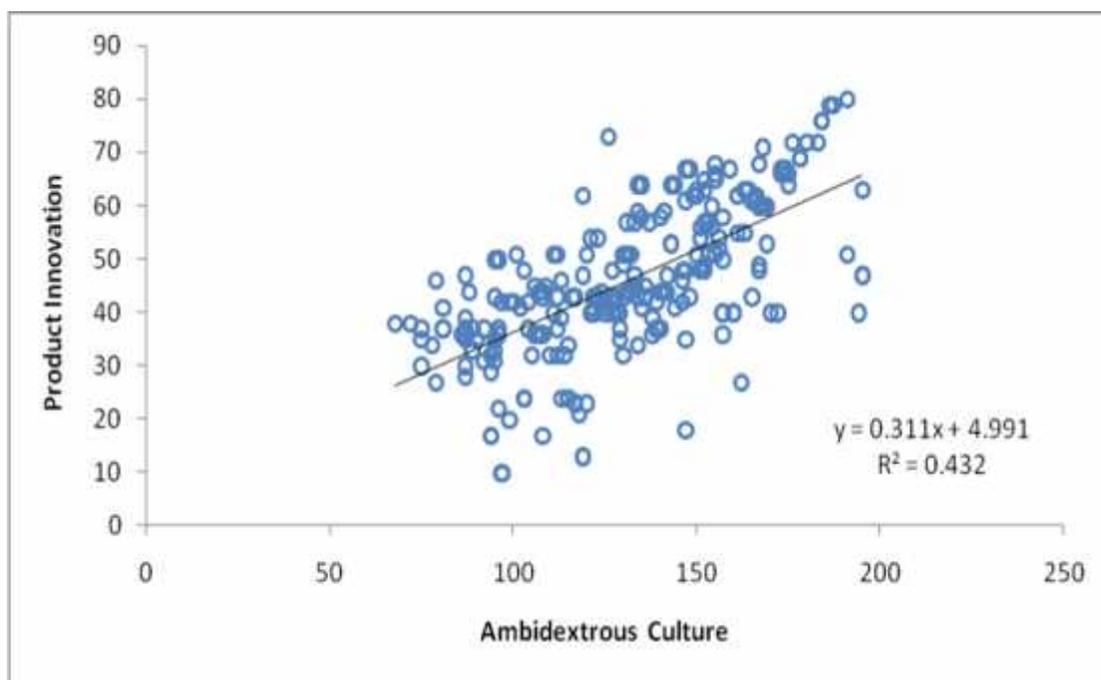
r - value	R Square	Durbin-Watson	F - value	p - value
0.657	0.432	1.746	188.671	0.000

This table shows that the ambidextrous culture and product innovation are highly correlated ( $r = 0.657$  with  $p < 0.01$ ). That is, as ambidextrous culture increases, product innovation also increases by 65.7%. It also indicates that ambidextrous culture has 65.7% influence on product innovation and that all the other factors which can influence product innovation have only 34.3% influence on product innovation. The inference, therefore, is that ambidextrous culture has a major influence on product innovation.

Here the R square is reported to be 0.432, which means 43.2% of the variance in product innovation is addressed by the predictor variable ambidextrous culture. The Durbin-Watson statistic is used to test the presence of serial correlation among the residuals. Here, the value of Durbin-Watson is 1.746, approximately equal to 2, indicating no serial correlation. ANOVA result is found to be significant with  $F = 188.671$  and  $p < 0.01$ . The regression is therefore valid. Hence the alternative hypothesis that there exists relationship between ambidextrous culture and product innovation is accepted.

Thus *there is a significant relationship between ambidextrous culture and product innovation*. The relationship between ambidextrous culture and product innovation is found to be positive.

**Fig. 1.1 Scatter plot showing the relationship between Ambidextrous culture and Product Innovation**



**Table 1.5 Coefficients**

	Unstandardized Coefficients		Standardized Beta	t - value	p - value
	Beta	SE			
<b>Constant</b>	4.991	3.033		1.645	0.101
<b>Ambidextrous Culture</b>	0.312	0.023	0.657	13.736	0.000

Here the beta value corresponding to ambidextrous culture is found to be significant as the corresponding p-value is less than the significant level 0.01. The regression equation explaining the relation between ambidextrous culture and product innovation can be written as

$$PI = 0.312 * AC$$

The findings are in support of the findings of Wang and Rafiq (2012) that ambidextrous organization culture significantly influences product innovation.

### Correlation between ambidextrous culture and product innovation

**Table 1.6 Correlation between ambidextrous culture and product innovation**

	Radical Innovation	Incremental Innovation	Speed to Market	Product Innovation
<b>Organizational Bonding</b>	0.576**	0.193**	0.594**	0.553**
<b>Top Management Support</b>	0.514**	0.172**	0.536**	0.496**
<b>Organizational Learning Capability</b>	0.568**	0.193**	0.566**	0.535**
<b>Creative Capability</b>	0.490**	0.174**	0.512**	0.477**
<b>Customer Focus</b>	0.453**	-0.021	0.511**	0.407**
<b>Research and Development</b>	0.517**	0.373**	0.521**	0.549**
<b>Organizational Collaboration</b>	0.410**	0.101*	0.399**	0.370**
<b>Ambidextrous culture</b>	0.622**	0.219**	0.642**	0.657**

\*\* Correlation is significant at 0.01 level

\* Correlation is significant at 0.05 level

The table 1.6 shows the correlation between the ambidextrous culture (AC) sub variables and the product innovation (PI) sub variables . The r values are shown within the bracket.

Organizational bonding is found to have a higher correlation with speed to market (.594) and radical innovation (.576). Top management support is highly correlated with speed to market (.536) and radical innovation (.514). Organizational learning capability is highly correlated with radical innovation (.568) and speed to market (.566). Creative capability is highly correlated with speed to market (.512) and radical innovation (.490). Customer focus is highly correlated with speed to market (.511) and radical innovation (.453).

All the ambidextrous culture (AC) sub factors are found to have a low correlation with incremental innovation. Even when it has low correlation with incremental innovation (II), research and development is found to have a better correlation with incremental innovation (r=.373). The correlation scores of all the other ambidextrous culture sub variables with incremental innovation are smaller than .373. It found that customer focus (CF) is negatively correlated with incremental innovation (r = -0.021).

Organizational collaboration is found to be highly correlated with radical innovation (.410) and speed to market (.399). All the sub variables except organizational collaboration have a greater correlation with the speed to market dimension of product innovation than the radical innovation dimension. In case of organizational collaboration, the correlation value is more for radical innovation (.410) than for speed to market (.399). However, the correlation between organizational collaboration and incremental innovation is also found to be less (.101).



## CONCLUSION

The paper reveals that there is a significant relationship between the ambidextrous culture and product innovation in software development organizations. Among the ambidextrous culture factors, organizational bonding has more influence on product innovation. Hence the software organizations focusing on product development has to foster this element in the organization to motivate the project teams. All the ambidextrous culture subfactors influence radical innovation more than incremental innovation.

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