

# **The Relationship between Organizational Structure and Organizational Learning in Turkish Automotive R&D Companies**

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**Abstract:** *There are numerous research studies on organizational structures (OS) and organizational learning (OL), however, empirical research investigating the relationship between these two topics in Turkish context does not exist. This article provides empirical evidence about how dimensions of organizational structure influence dimensions of organizational learning. The relationship is investigated from the viewpoint of research and product development engineers in R&D companies in Turkish automotive industry.*

*The quantitative research findings show that centralization and formalization have a significant negative relationship with organizational learning dimensions (organizational level learning stock, feedforward learning and feedback learning) where specialization has a positive relationship.*

**Keywords:** *Organizational structure, formalization, centralization, specialization, organizational learning, learning stocks, learning flows.*

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## **1. INTRODUCTION**

Organizations change in order to adapt to their environment and the process of change results in learning. Organizational learning (OL) can be defined with a wide variety of conceptualizations. Studies from Argyris and Schön (1978), Levitt and March (1988), Huber (1991), Kim (1993), Dodgson (1993), Crossan et al. (1999), Bontis et al. (2002), Templeton et al. (2002), Chiva et al., (2007), are major examples of different perspectives provided in literature.

Regarding how OL occurs, both earlier and recent researchers were interested in the factors which affect the development of OL and they have identified similar influencing factors (Fiol and Lyles, 1985; Nicolini and Mezner, 1995; Templeton et al., 2002; Bapuji and Crossan, 2004). The four main contextual factors are; (1) organizational structure (OS); (2) corporate culture; (3) strategy; (4) environment. The factors influencing OL is still a research area and OS is of special interest for this study because there is little empirical research conducted about the role of OS in OL whether OS can be considered as a basic mechanism for learning and whether it has an effect on the organization and its members for creating knowledge.

The purpose of this research study is to investigate the relationship between selected dimensions of OS and OL in Turkish automotive industry context. Hypotheses about these relationship are proposed and tested using data collected from 103 respondents from three different Turkish automotive R&D companies. The hypothesized relationships are empirically tested using statistical Pearson correlations and multiple regression analysis, supported by the Statistical Package for Social Sciences (SPSS).

## **2. PROBLEM STATEMENT**

In this study, the formation of organizational structure is presumed to have an impact on the capability of an organization to adapt to change. It can decrease or increase its ability to innovate and to create new solutions, to add value, or to learn. Organizational structure has a major influence on a company to identify its knowledge sources, to acquire new knowledge, and to integrate the knowledge into the organization to improve its learning capability (Martinez León, M. and Martinez Garcia, J.A., 2011).

Although the significance of both OS and OL has been well established in the literature, there is absence of empirical research investigating the relationship between OS and OL with respect to Turkish automotive R&D industry. Understanding the dynamics and their interactions can provide

significant insight to managers and researchers to understand the organizational settings that enable OL. This paper will thus analyze this relationship between OS and OL.

### **3. ORGANIZATIONAL STRUCTURE**

The dimensions of Organizational structure (OS) is a basis for analyzing the characteristics of an organization and the literature provides an identification of these proposed by different authors (Hall, 1962; Hage and Aiken, 1967; Blau, 1967; Pugh et al., 1968; Child, 1974; Galbraith, 1976; Mintzberg, 1979; Robbins, 2001). According to Child (1974), three major dimensions of OS are: (1) centralization, the degree to which the authority is kept at the higher levels of hierarchy when making decisions affecting the organization; (2) specialization, the degree to which official duties are divided among functional areas; and (3) formalization, the degree to which organizational activities are conducted with written standard procedures, rules and instructions. These three dimensions are significant to highlight structural similarities and differences between organizations and the present study will concentrate on these three dimensions.

#### **3.1. Centralization**

According to Pugh et al. (1968), centralization implies that the authority to make decisions affecting the organization is located at one hierarchically high level or at several hierarchically lower levels. Daft (2004) describes the difference between centralization and decentralization. If the degree of decentralization is high, there is delegation of authority, and employees can execute their activities with minimum need of approval from an upper level manager. Literature contains findings showing that decentralization promotes communication in organizations which creates a workplace with a faster response to change (Burns and Stalker, 1961; Dewar and Werbel, 1979; Schminke et al, 2002). It facilitates interpersonal exchange and social interaction, essential for transferring strategic knowledge (Chen and Huang, 2007).

#### **3.2. Specialization**

Pugh et al. (1968) describe specialization as the distribution of duties between a numbers of positions. Daft (2004) describes specialization as the degree to which organizational tasks are subdivided into separate jobs. The tasks can be performed with more focus if specialization is high. This can be achieved when the personnel in departments with specialized functions are highly competent at their own tasks and responsible for a single or a few numbers of tasks (Mintzberg, 1979). Friedman (1961) calls specialization, as the degree to which tasks are assigned to a particular role “specialist” as a person who is highly competent with specific skills. Specialization is related with OL because it implies utilization of in-depth information and organizational members focusing on specific knowledge areas (Ouksel and Vyhmeister, 2000).

#### **3.3. Formalization**

Pugh et al. (1968) describe formalization as the extent to which rules, procedures, interactions and information flows, are written and describe job behaviors and activities within the organization. Highly formalized organizations practice written procedures and structured information flows widely which reduces discussions of alternatives to creative solutions.

With low formalization, job behaviors are less structured and there is more freedom when dealing with organizational activities (Sivadas and Dwyer, 2000). This brings willingness to take alternatives into account. The social interaction and collaboration is observed more when implementing tasks (Robbins and Decenzo, 2001). A less formalized structure can encourage social interactions, creativity and learning processes (Martinez-León and Martinez-Garcia, 2011).

### **4. ORGANIZATIONAL LEARNING**

A review of literature provides an insight into the various definitions of organizational learning. In some studies organizational learning is defined from a process view: the actions and experiences of individual members of an organization enable learning (Argyris, 1977), the process of improving activities through better knowledge and understanding (Fiol & Lyles, 1985). Levitt and March (1988) defines OL as a process in which “organizations learn by encoding inferences” from their past experience, and update their routines. Huber (1991) sees OL as an information processing activity with four sub-processes through which an organization expands its collection of possible behaviors.

Dodgson (1993) proposed an outcome view of OL rather than a process and described it as the development of organizational efficiency by use of competencies around which organizations build knowledge. With the knowledge about the outcome of an action, the relationship between the organization and its environment can be developed (Daft and Weick, 1984). The actions can be improved through better understanding of their outcome, and the organizational performance can be improved with knowledge and experience (Nevis et al., 1995). However, a small portion of organizations make considerable effort regarding organizational learning to achieve their goals. The ones without appropriate organizational learning systems experience the opposite of desired behaviors (Kim, 1993).

The 4I organizational learning model of Crossan et al. (1999) views learning of organizations as a multi-dimensional and dynamic process. OL occurs at three levels (individual, group, and organizational) with four sub-processes (intuiting, interpreting, integrating, and institutionalizing). The so called “learning flows” (feed-forward learning and feed-back learning) connect those levels and sub-processes. Exploring new knowledge is seen as related to feed-forward learning, while exploiting what is already known by the organization is related to feed-back learning. As individuals acquire new knowledge in the form of information, behaviors, or insights, these get communicated to the group and to the organization through feed-forward flow of knowledge. Once knowledge gets institutionalized in the forms of organizational policies, procedures, systems, norms, etc., it then affects through feed-back flow of learning how individuals and groups in the organization learn.

Strategic Learning Assessment Map (SLAM) framework is the operationalization of the 4I framework by Crossan et al. (1999). SLAM framework comprises two categories; (1) learning stocks; and (2) learning flows. In explaining the dynamics of organizational learning Crossan et al. (1999) use the terms learning stocks and flows. However, Bontis (1999) use terms knowledge stocks and flows in explaining the same concept. Bontis (1999) makes a distinction between learning stocks and flows by basing the former to a resource-based view and the latter to a knowledge management view. Bontis (1999) views learning stocks as static knowledge embedded in minds of individuals and in the organizational memory. Knowledge flows, on the other hand, are the mechanism through which these knowledge stocks flow. They are a continuous and dynamic interactions between implicit and explicit forms.

When explaining the relationship between learning flows and learning stocks, Kyriakopoulos and de Ruyter (2004) consider that learning stocks contribute to organizational memory. Flows of learning are constituted of information related to current or new issues happening in the external environment of the firm. In this sense, new information flows in the organizational units, gets absorbed by them, and finally contributes to the accumulation of knowledge stocks of the organization.

## **5. THE LINK BETWEEN ORGANIZATIONAL STRUCTURE (OS) AND LEARNING (OL)**

Organizational structure has an effect on the efficiency of distribution and coordination of information and knowledge within an organization. Chen and Huang (2007) also mention interpersonal exchange, organizational resources, communication methods and the interactions between organizational members as influenced by the structure. Since a company’s learning capability depends on its power of processing and interpreting the information, the structure has an effect on the learning process.

Nicolini and Mezner (1995) proposed also that organizational structure is a significant factor in the learning process since organizational members who interpret and integrate the knowledge are the primary entities within the organizational framework. Similarly, Martinez-León and Martinez-Garcia (2011) proposed that the organizational structure has an influence on learning by influencing the capability of a company to adapt, to innovate or to improve its ability to generate added value to its environment.

## **6. RESEARCH QUESTION AND HYPOTHESES**

This study looks for the answer to the following question: What is the relationship between the three major dimensions of organizational structure (Centralization, Formalization, and Specialization) according to Child (1974) and the three organizational learning dimensions (organization level learning stock, feed-forward learning flow and feed-back learning flow) according to Crossan et al. (1999)? In order to answer the research question, the following hypotheses are tested:

H1: Centralization in an organization is negatively related to organizational level learning stock in the organization

H2: Formalization in an organization is negatively related to organizational level learning stock in the organization

H3: Specialization in an organization is negatively related to organizational level learning stock in the organization

H4: Centralization in an organization is negatively related to feed-forward learning flow in the organization

H5: Formalization in an organization is negatively related to feed-forward learning flow in the organization

H6: Specialization in an organization is negatively related to feed-forward learning flow in the organization

H7: Centralization in an organization is negatively related to feed-back learning flow in the organization

H8: Formalization in an organization is negatively related to feed-back learning flow in the organization

H9: Specialization in an organization is negatively related to feed-back learning flow in the organization

## **7. METHODOLOGY**

This study utilized a quantitative method. Survey data was collected through self-administered questionnaires. Target sample comprises research and development professionals and product development engineers working in Turkish automotive R&D companies. The relationship of the two concepts; organizational structure (OS) and organizational learning (OL) is statistically examined.

### **7.1. Description of the Sample**

The target population is the research and development professionals and product development engineers working in Turkish automotive R&D companies. Samples from three different organizations (the first one has around 30 employees with 15 years of history, the second one has around 85 employees with a 7 years of history, the third one has around 1200 employees with a history of 60 years) were called to fulfil the study's objectives. Other considerations as the organizations' convenience and accessibility were also taken into account. The unit of analysis is individual employees (R&D professionals, product development engineers). 110 questionnaires were sent out with a response rate of 94% percent accounting for 103 returned questionnaires. Demographic information shows that 78.6% are male, 32% are married, and respondent age varies between 23 and 48 with a mean of 29.5 which reflects a young population. The information also shows that average total work experience is 5.2 years and the average work experience at the current company is 2.6 years.

### **7.2. Measurement Instruments**

The measures for organizational structure are obtained from those reported by Hage and Aiken (1967). Most were originally designed by Hall (1963). Hage and Aiken (1967) slightly changed the phrasing and added several new questions.

Questions under Centralization refer to types of decision making. The items under Participation in Decision Making (measured by items C1 through C5) all appear to refer to decisions concerning the implementation of policy and the distribution of resources. Centralization also refers to the concentration of work related decisions, apparently in the hands of supervisors. The items in the Hierarchy of Authority scale (measured by items C6 through C9) refer specifically to the task. All items in it refer to the degree to which one must allow someone higher in the hierarchy to make decisions. Formalization is defined as the degree to which jobs are codified (Hage and Aiken, 1967)

and the strictness with which these rules are observed. Job codification consists of five items (measured by items F1 through F5) about the specifications of job descriptions or work standardization. Rule observation consists of two items (measured by items F6 and F7) about the type of supervisions to ensure employees conform to the job codification standard. Specialization is defined according to Daft (2004) as the degree to which organizational tasks are subdivided into separate jobs (measured by item S1) and departments are differentiated from each other through diverse skills and attitudes appropriate for their specialized functions (measured by item S2).

The measures for organizational learning are obtained from the study by Bontis et al. (2002). They developed a construct called Strategic Learning Assessment Map (SLAM) based on the framework by Crossan et al. (1999). This construct contains three learning stocks; (1) individual level learning stocks, (2) group level learning stocks, and (3) organizational level learning stocks, and two learning flows; (1) feed-forward learning flows and (2) feed-back learning flows. These stocks of learning and flows of learning are combined with the intuiting, interpreting, integrating, and institutionalizing processes as defined by Crossan et al. (1999). Bontis et al. (2002) operationalized the SLAM framework by using a 7-point Likert-type scale (1 for strongly disagree, and 7 for strongly agree).

In this study 30 items are used in three dimensions (organizational level learning stock as measured by items OL1 through OL10, feedforward learning as measured by items FF1 through FF10, and feedback learning as measured by items FB1 through FB10). According to Bontis et al. (2002), several pilot studies were conducted to validate these constructs, the reliability and validity of the questionnaire items were tested and found adequate. All items are rated on a seven-point Likert scale, namely 1-strongly disagree, 7- strongly agree.

In addition, there were also 7 demographic variables, including two company data (employee number and company tenure) and five personal data (gender, age, marital status, total work experience, and total years of service at the current firm).

### **7.3. Pilot Test**

Following the designing of the questionnaire the items were pre-tested before the actual distribution of the questionnaires to ensure that questionnaire items convey the intended meaning to the participants. A few minor changes on the wording of some items were done according to the feedback from the pilot test. With those refinements, pilot test results confirmed that questionnaire items are clear in meaning and applicable to professional organizational members.

### **7.4. Data Analysis**

This study uses multiple regressions to analyze the relationships between the dimensions of OL and dimensions of OS. Independent variables are organizational structure dimensions (centralization, specialization, formalization), and dependent variables were organizational learning dimensions (organizational level learning stocks, feedback and feedforward learning flows). This study first conducted exploratory factor analysis on each dimension. Pearson Correlation was used to identify the relationships that exist between the variables and multiple regression analysis was used to determine the influence that exists between the variables and to test the hypotheses of the study. Results were computed and analyzed using SPSS version 21.0.

### **7.5. Reliability and Validity Analysis**

To ensure the validity of the measures, an exploratory factor analysis was carried out. The resulting factor structure cumulatively explained 71.61% and 73.88% of the variances of organizational learning and organizational structure, as shown in the Table 1.

Reliability analysis was carried out after the exploratory factor analysis. Reliabilities between 0.70 and 0.80 are acceptable and over 0.80 can be considered to be good (Sekaran, 2003). All dimensions of organizational structure and organizational learning show good Cronbach Alpha at .951 for organizational level learning stock, .959 for feed forward learning, .947 for feedback learning, .956 for centralization, .915 for formalization, and .827 for specialization.

**Table1.** Exploratory factor analysis results

<b>Organizational Learning</b>								
	Items	Factor Loads		Items	Factor Loads		Items	Factor Loads
Organizational level Learning Stocks	OL1	0.737	Feed forward Learning	FF1	0.779	Feedback Learning	FB1	0.592
	OL2	0.691		FF2	0.741		FB2	0.775
	OL3	0.704		FF3	0.671		FB3	0.669
	OL4	0.609		FF4	0.705		FB4	0.640
	OL5	0.671		FF5	0.650		FB5	0.643
	OL6	0.726		FF6	0.726		FB6	0.723
	OL7	0.745		FF7	0.648		FB7	0.670
	OL8	0.546		FF8	0.611		FB8	0.787
	OL9	0.542		FF9	0.668		FB9	0.674
	OL10	0.713		FF10	0.680		FB10	0.782
<b>Organizational Structure</b>								
	Items	Factor Loads		Items	Factor Loads		Items	Factor Loads
Centralization	C1	0.762	Formalization	F1	0.803	Specialization	S1	-0.903
	C2	0.718		F2	0.835		S2	-0.842
	C3	0.799		F3	0.780			
	C4	0.814		F4	0.780			
	C5	0.758		F5	0.699			
	C6	0.875		F6	0.654			
	C7	0.812		F7	0.679			
	C8	0.884						
	C9	0.838						

**8. RESULTS AND FINDINGS**

**8.1. Correlation Analysis**

Data were summated dimension wise before checking for correlation analysis. Correlations were run between the study’s independent and dependent variables. The results are shown in Table 2. In understanding the relationship between organizational structure and organization learning Pearson correlation statistical analysis revealed the following results. Centralization and formalization are positively correlated with each other and with corporate size and age at a significance level of 0.01. Specialization is negatively correlated with corporate size and age, centralization and formalization.

**Table2.** Correlation Analysis Results

Variables	Mean	SD	1	2	3	4	5	6	7	8
1-Corporate Size	563.	-	1							
2-Corporate Age	31.6	-	.989	1						
3-Centralization	3.18	1.15	.456	.441	1					
4-Formalization	3.43	.93	.754	.701	.655	1				
5-Specialization	5.06	1.10	-.244*	-.214*	-.415	-.351	1			
6-Org level learning	4.75	1.08	-.405	-.383	-.727	-.611	.541	1		
7-Feedforward learning	4.64	1.08	-.458	-.430	-.746	-.691	.523	.852	1	
8-Feedback learning	4.82	1.00	-.433	-.409	-.813	-.660	.495	.796	.815	1

\*correlation is significant at the 0.05 level

All three organizational learning dimensions (organizational level learning, feedforward learning, and feedback learning) are also negatively correlated with corporate size and age, and two of the organizational structure dimensions (centralization and formalization) but positively correlated with specialization at a significance level of 0.01.

**8.2. Test of Assumptions for Regression Analysis**

The validity of regression analysis depends on several assumptions; the test of independence, normality, linearity, homoscedasticity, and multicollinearity. Durbin-Watson test was applied to test the independence. Normality is assumed as the sample size >100. Assumptions of linearity and homoscedasticity are not violated and multicollinearity is diagnosed with variance inflation factors (VIFs).

**8.3. Hypothesis Testing**

Regression analysis was used for testing hypotheses H1 to H9. Table 3 summarizes the results of these tests. Multiple regressions was applied to examine the influence of individual organizational structure dimensions on each organization learning dimension.

**Table3.** *Effect of organizational structure on organizational learning*

Model	Org Level Learning			Feedforward Learning			Feedback Learning		
	1	2	3	4	5	6	7	8	9
Centralization	-0.727	-0.573	-0.485	-0.746	-0.515	-0.441	-0.813	-0.667	-0.612
Formalization		-0.236	-0.198		-0.353	-0.321		-0.223	-0.199
Specialization			0.271			0.227			0.172
R2	0.529	0.561	0.621	0.557	0.628	0.671	0.661	0.691	0.714
Adjusted R2	0.524	0.552	0.609	0.553	0.621	0.661	0.658	0.683	0.705
F	113.3	63.79	53.88	127.1	84.47	67.13	197.2	111.1	82.28
N	103	103	103	103	103	103	103	103	103

*Standardized regression coefficients are shown, all values with significance  $p < 0.01$*

Results indicate that centralization and formalization both have a negative influence ( $\beta = -0.485$ ,  $\beta = -0.198$ ,  $p < 0.01$ ) and specialization has a positive influence ( $\beta = 0.271$ ,  $p < 0.01$ ) on organizational level learning stock. Therefore hypotheses H1: Centralization in an organization is negatively related to organizational level learning stock in the organization, and H2: Formalization in an organization is negatively related to organizational level learning stock in the organization are supported. H3: Specialization in an organization is negatively related to organizational level learning stock in the organization is not supported due to a positive relation between specialization and organizational level learning stock. Model 1 has a predictive nature at 0.529, and Model 2 at 0.561. The collective predictive nature for Model 3 is at 0.621 which indicates 62.1 percent of the variance in organization level learning can be explained by centralization, formalization and specialization. It can be considered as a linear relationship exists.

The results for feedforward learning indicate that centralization and formalization both have a negative influence ( $\beta = -0.441$ ,  $\beta = -0.321$ ,  $p < 0.01$ ) and specialization has a positive influence ( $\beta = 0.227$ ,  $p < 0.01$ ). Hypotheses H4: Centralization in an organization is negatively related to feed-forward learning flow in the organization, and H5: Formalization in an organization is negatively related to feed-forward learning flow in the organization are both supported. H6: Specialization in an organization is negatively related to feed-forward learning flow in the organization is not supported due to its positive relationship. The R square for Model 6 shows that 67.1 percent of the variance in feedforward learning can be explained by centralization, formalization and specialization where a linear relationship exists between the variables.

For feedback learning dimension, similar results were calculated. Centralization and formalization both have a negative influence ( $\beta = -0.612$ ,  $\beta = -0.199$ ,  $p < 0.01$ ) and specialization has a positive influence ( $\beta = 0.172$ ,  $p < 0.01$ ) on feedback learning. Hypotheses H7: Centralization in an organization is negatively related to feedback learning flow in the organization, and H8: Formalization in an organization is negatively related to feedback learning flow in the organization are both supported. H9: Specialization in an organization is negatively related to feedback learning flow in the organization is not supported due to its positive relationship. From Model 9, 71.4 percent of the variance in feedforward learning can be explained by centralization, formalization and specialization. A linear relationship exists between the variables.

In summary, the results indicate that centralization and formalization dimensions of organizational structure are negatively related to all organizational learning dimensions where specialization dimension has a significant positive relationship.

**9. CONCLUSIONS**

This study aimed an understanding the influence of organizational structure on organization learning in Turkish automotive R&D companies. Findings of this study indicate that the professional organizational participants perceive a negative effect of centralization and formalization on organizational learning, and a positive effect of specialization on organizational learning in their companies.

The relationships between the independent variables and the dependent variables as arranged in the research model are all significant at a level of 0.01. The influence of the independent variables on the dependent variable is predictive in nature. All three organizational structure dimensions seem to have an influence on organization learning dimensions. Among the relationships between dimensions, centralization had the highest negative correlation. Formalization also had a negative correlation, but specialization had a positive correlation with all three dimensions of organization learning (organizational level learning stock, feed-forward and feed-back learning flows).

The research findings suggest that in a continually changing environment where research and development activities require organizational members to acquire skills and expertise, autonomy and self-regulation enables an organization to discuss alternatives and to explore new ideas and solutions. Therefore, decentralization as a source of variety and experimentation is required for learning to occur. Similarly, extensive use of written procedures and structured information flows which reduces discussions of alternatives impedes developing new ideas and learning.

It is important to note that although in literature it is mostly stated that advances in technology lead to a flattening of hierarchies of authority, decreases in centralization, and less specialization, the results of the hypothesis testing indicates that specialization has a positive relationship with organizational learning dimensions in Turkish automotive R&D companies. This result might suggest that because specialization implies the possession of in-depth information which requires accumulation and preservation of technological expertise in specific knowledge areas at the level of individual activities, it influences OL positively. In R&D companies, specialization brings execution of individual tasks with speed and efficiency.

## **10. RECOMMENDATIONS**

### **10.1. Recommendations for Corporate Management**

Organizational structure is an important factor for automotive R&D companies in Turkish context to improve their organizational learning capability. An organization's level of formalization, centralization and specialization is determined by managerial decisions and in a continually changing competitive environment; managers should design organizational structures to encourage organizational learning.

For learning purposes organizational structures should be designed with a higher level of decentralization. Managers in automotive R&D companies can provide more autonomy and self-regulation to engineers which enables them to discuss a variety of alternatives and propose new solutions. Managers should also consider more informal character with less written procedures and more unstructured information flows so that interaction is promoted which is necessary for transferring knowledge to enhance learning.

Specialization facilitates OL because it implies development of in-depth information and focus on specific knowledge areas which provides organizational members in R&D companies the freedom to design new products and create new technologies.

These elements bring members of an R&D organization to engaging in learning processes that help the organization grow, learn, and adapt to an unpredictable and evolving global environment.

### **10.2. Recommendations for Future Research**

This study focused only on the automotive R&D companies and a selected number of organizations as part of the research. Results are therefore not fully generalizable and applicable in other contexts and sectors. Additionally, the study focused only on a selected number of dimensions to investigate while many more may exist. Moreover, a limited number of statistical tests were conducted to draw conclusions; more analysis could have been conducted at a greater depth. In light of these limitations, some suggestions for future research are as follows:

This study be carried out in a different sector/industry so as to understand the level of difference. For this, researchers can adopt a comparative study. A comparative study can also be carried out within the same sector but focusing on two different geographical locations in which aspects like culture and organization practices can be highlighted in the research findings.

Future research can also attempt to find other dimensions of organizational structure that have an impact on the organizational learning. Dimensions other than centralization, formalization and



specialization can affect an organization's learning dynamics. Attempting to identify dimensions that exist differently in different contexts (for example, a different industry) researchers will also be able to understand the variability in the dimension that influence an organization's learning.

Some company demographic variables such as tenure and location were not hypothesized in this research but can potentially produce interesting results in future research as to the reasons why companies in these specific demographics have higher motivation to innovate, learn and adopt new technologies formally.

## REFERENCES

- Argyris, C., Double-Loop learning in organizations, *Harvard Business Review*. 55(5), 115 (1977).
- Argyris, C. and Schön, D.A., *Organizational Learning: A Theory of Action Perspective*, Reading, MA: Addison-Wesley, 1978.
- Bapuji, H. and Crossan, M.M., from questions to answers: reviewing organizational learning research, *Management Learning*. 35 (4), 397 (2004).
- Bontis, N., Crossan, M.M. and Hulland, J., Managing an organizational learning system by aligning stocks and flows, *Journal of Management Studies*. 39 (4), 437 (2002).
- Burns, T., and Stalker, G.M., *The management innovation*, London: Tavistock, 1961.
- Chen, C.J. and Huang, J.W., How organizational climate and structure affect knowledge management – the social interaction perspective, *International Journal of Information Management*. 27(2), 104 (2007).
- Child, J., *Organizational Structure and Strategies of Control: A Replication of the Aston Studies*, *Administrative Science Quarterly*. 17, 163 (1974).
- Chiva, R., Alegre, J. and Lapiedra, R., Measuring organisational learning capability among the workforce, *International Journal of Manpower*. 28 (3), 224 (2007).
- Crossan, M. M., Lane, H. W., & White, R. E., An organizational learning framework: From intuition to institution, *Academy of Management Review*. 24(3), 522 (1999).
- Daft, R.L., Weick, K.E., toward a model of organizations as interpretation systems, *Academy of Management Review*. 9(2), 254 (1984).
- Daft, R.L., *Organization Theory and Design*. 8th Edition. Mason, OH: South Western, 2004.
- Dewar, R., and Werbel, J., Universalistic and contingency predictions of employee satisfaction and conflict, *Administrative Science Quarterly*. 24 (3), 426 (1979).
- Dodgson, M., *Organizational learning: a review of some literatures*, *Organization Studies*. 14 (3), 375 (1993).
- Fiol, C.M. and Lyles, M.A., "Organizational learning", *Academy of Management Review*, 10 (4), 803 (1985).
- Friedman, G., *The anatomy of work: the implications of specialization*, London: Heinemann, 1961.
- Garvin, D., *Building and learning organization*, *Harvard Business Review*. 71(4), 78 (1993).
- Hage, J. and Aiken, M., Relationship of centralization to other structural properties, *Administrative Science Quarterly*. 12(1), 72 (1967).
- Hall, R., *Organizations, Structure and Process*. Englewood Cliffs, New Jersey: Prentice-Hall, 1972.
- Huber, G.P., *Organizational learning: the contributing processes and the literatures*, *Organization Science*. 2 (1), 88 (1991).
- Kim, D.H., The link individual and organizational learning, *Sloan Management Review*. 35 (1), 37 (1993).
- Kyriakopoulos, K., and de Ruyter, K., Knowledge stocks and information flows in new product development, *Journal of Management Studies*. 41(8), 1469 (2004).
- Levitt, B. and March, J.G., *Organizational learning*, *Annual Review of Sociology*. 14, 319 (1988).
- Martinez-León, M., Martinez Garcia, J.A., The influence of organizational structure on organizational learning, *International Journal of Manpower*. 32 (5), 537 (2011).
- Mintzberg, H., *The Structuring of Organizations: A Synthesis of the Research*, Englewood Cliffs, NJ: Prentice Hall, 1979.

- Nevis, E., DiBella, A., Gould, J., Understanding organizations as learning systems, *Sloan Management Review*. 36(2), 73 (1995).
- Nicolini, D. and Meznar, M.B., The social construction of organizational learning: conceptual and practical issues in the field, *Human Relations*, 48 (7), pp. 727 (1995).
- Ouksel, A. and Vyhmeister, R., Performance of organizational design models and their impact on organization learning, *Computational & Mathematical Organization Theory*. 6(4), 395 (2000).
- Pugh, D. S., Hickson, D. J., Hinings, C. R., Macdonald, K. M., Turner, C., A conceptual scheme for organizational analysis, *Administrative Science Quarterly*. 8(3), 289 (1963).
- Pugh, D. S., Hickson, D. J., Hinings, C. R., Turner, C., Dimensions of organization structure. *Administrative Science Quarterly*. 13(1), 65 (1968).
- Robbins, S.P. and Decenzo, D.A., *Fundamentals of Management: Essential Concepts and Applications*, New York, NY: Prentice Hall, 2001.
- Schminke, M., Cropanzano, R., and Rupp D.E. (2002), 'Organization structure and fairness perceptions: The moderating effects of organizational level,' *Organizational Behavior and Human Decision Processes*, 89 (1), 881-905.
- Sekaran, U., *Research Methods for Business: A Skill Building Approach*, 4th edition, New York: John Wiley, 2003.
- Sivadas, E. and Dwyer, F.R., An examination of organizational factors influencing new product success in internal and alliance based processes, *Journal of Marketing*. 64(1), 31 (2000).
- Templeton, G.F., Lewis, B.R. and Snyder, C.A., Development of a measure for the organizational learning construct, *Journal of Management Information Systems*. 19(2), 175 (2002).

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