

# Investigating the Relationship between Knowledge Management Dimensions and Organizational Performance in Lean Manufacturing

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## Abstract

The objective of this research is to study the relationship between knowledge management dimensions and organizational performance in lean manufacturing. In this regard, five research hypotheses were tested. Research statistical population included staffs of Mes-E- Sarcheshmeh Company. 194 individuals of research samples were selected through simple random sampling method. Research data were collected through knowledge management standard questionnaire and researcher made organizational performance questionnaire. Data were analyzed using SPSS19 software; further, Kolmogorov-Smirnov test and Pearson correlation test were also used. Research results indicated that there is a significant relationship between knowledge management dimensions and organizational performance in lean manufacturing.

**Keywords:** Knowledge management, knowledge management dimensions, organizational performance, lean production.

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## Introduction

In the present age referred as age of knowledge, organizations witness increasingly more dynamic and challenging contexts. Change and evolution is the integral part of the present world; in a better word, change is the only constant component. Intangible and intellectual assets regarded as knowledge are now viewed as critical factors (Majidi kelyber et al, 2016). Today, organizations are permanently influenced by environmental factors such that few organizations may control these factors. In this regard, successful organizations are referred as the organizations not only acquire adequate knowledge and recognition of these factors, but also improve performance level and achievement at the present competitive context (Denning, 2006). Knowledge management is a structured approach at the individual, group, and organizational level enhancing organization ability and accelerated service development through knowledge creation, sharing, and application (Du Plessis and Boon, 2004). Respecting to organizational performance and access to the sustained competitive advantage, knowledge is regarded as a significant element (Petrova et al, 2012; Dermol, 2013). Today, industrial organizations make every effort to achieve economic supremacy in addition to surviving and penetrating in the global market by increased efficiency, removing any losses, higher quality products, decreased final price, and timely delivery of customers' demands; such an achievement is only realized through moving toward lean production. Studying the trend of industrial production and changes of macro firms around the world reveals that production methods are oriented toward lean production and lean thinking; hence, it seems necessary to localize this production method in our country. Thus, main objective of this research is to study the relationship between knowledge management and organizational performance in lean production at Mes Sarcheshmeh Company.

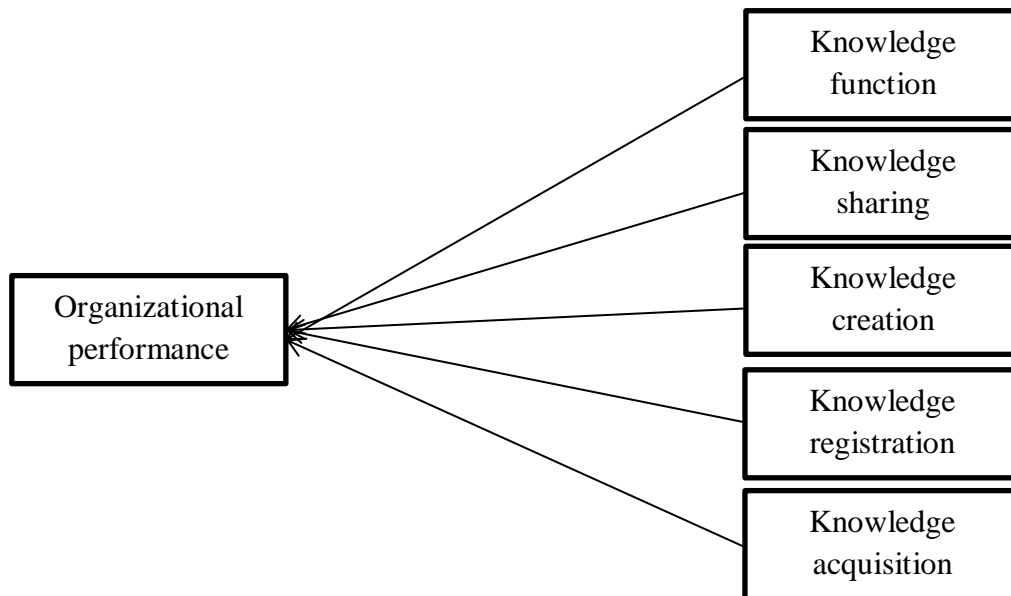
## Research literature

### *Knowledge management and organizational performance*

Knowledge management is referred to the set of processes of knowledge acquisition, maintenance, and using. Knowledge management focuses on exploitation of intellectual properties to enhance efficiency, to create new values, and to increase competitiveness. It is defined by activities such as knowledge collection, sharing, and using. Knowledge collection is referred as the process of appropriate knowledge searching, discovering, saving, and retrieval within and outside the organization (Chen and Chung, 2009). Organizational performance is how organizational commissions, commitments, and activities are operated and the results. Performance management is perceived as a collection of information and interventions for enhancing optimal uses of facilities and resources to economically, efficiently, and effectively achieve the objectives (Allen et al, 2008). Performance management causes supervisors to easily detect staffs' poor performance and to take some improving measures. On the other side, it encourages optimal performance and repeatability by giving proper rewards to the staffs' optimal performance. Performance management is a process embracing performance assessment, discipline systems, as well as complaint policies as its managerial tools. These managerial tools and techniques are benefited to improve staff efficiency and to achieve organizational competitiveness (Liao and Wu, 2009). Petrova (2012) believes that success

of any institute, particularly the organizations, almost depends on its member performance and function. Motowidlo (2003) considers performance as time expected general values of singular behavior components. According to Mayer, staff performance follows the two factors of ability and motivation. Thus, research conceptual model is as follows:

*Knowledge management dimensions*



**Research methodology**

This is an applied study in term of purpose as all research findings are used to solve specific problems within the organization. Respecting to data collection, it is a descriptive survey since it tries to gather required information of research samples through using the questionnaire. Furthermore, it is cross-section and a quantitative study in terms of time and data, respectively.

*Instrumentations*

Preliminary field data were collected through a 33-item questionnaire of five-points Likert scale. Knowledge management dimensions and performance were evaluated using standard and researcher-made questionnaires. According to Table 1, confidence coefficient of 84% obtained using Cronbach alpha method through SPSS.

Table 1 Cronbach alpha coefficient

Cronbach alpha	Number
0.84	194

### *Research population and sample*

298 individuals of Mes Sarcheshmeh Company were randomly selected and the questionnaire was distributed; then, 194 questionnaires (about 65% of the included research samples) were returned.

### **Findings**

Data normality of research variables was tested by Kolmogorov-Smirnov test.

Table 2 Results of Kolmogorov-Smirnov test

	Knowledge acquisition	Knowledge registration	Knowledge creation	Knowledge sharing	Knowledge function (use)	Performance
Kolmogorov-Smirnov Z	1.478	0.635	0.462	1.361	1.303	1.216
sig	0.127	0.728	0.805	0.114	0.116	0.119

In data normality test, null hypothesis states that data are normally distributed; whereas, the alternative hypothesis implies the contrary. Significance level of all data, as seen in the above table, is larger than 0.05; hence, it may be stated that data of research questionnaire are normally distributed. In this regard, parametric statistics are used for testing the hypotheses.

**First hypothesis:** There is a relationship between knowledge acquisition and performance.

Table 3 Summary of Pearson correlation coefficient test on knowledge acquisition and lean production

First variable	Second variable	Correlation coefficient	Significance level	Test result
Knowledge acquisition	Performance	0.765	0.000	Maintained

According to the Table 3, Pearson correlation coefficient of knowledge acquisition and performance is 0.765 at the significance level of 0.000; thus, there is a significant positive correlation seen between the two variables. As a result,  $H_0$  is rejected at the confidence level of 0.95 and  $H_1$  is maintained; therefore, it concluded that there is a direct relationship between knowledge acquisition and performance.

**Second hypothesis:** There is a relationship between knowledge registration and performance.

Table 4 Summary of Pearson correlation coefficient test on knowledge registration and lean production

First variable	Second variable	Correlation coefficient	Significance level	Test result
Knowledge registration	Performance	0.756	0.001	Maintained

As seen in the table 4, Pearson correlation coefficient of knowledge registration and performance obtained 0.756 at the significance level of 0.001; therefore, there is a positive significant correlation between the two variables. Thus,  $H_0$  is rejected; whereas,  $H_1$  or research hypothesis is maintained at .95. It deduced that there is a direct relationship between knowledge registration and performance.

**Third hypothesis:** There is a relationship between knowledge creation and performance.

Table 5 Summary of Pearson correlation coefficient test on knowledge creation and lean production

First variable	Second variable	Correlation coefficient	Significance level	Test result
Knowledge creation	Performance	0.786	0.000	Maintained

As seen in the table 5, Pearson correlation coefficient between knowledge creation and performance is 0.786 at significance level of 0.000 indicating that there is a positive significant correlation between the two variables. Thus, at 0.95,  $H_0$  is rejected; while,  $H_1$  or research hypothesis is maintained. It concluded that there is a direct relationship between knowledge creation and performance.

**Fourth hypothesis:** There is a relationship between knowledge sharing and performance.

Table 6 Summary of Pearson correlation coefficient test on knowledge sharing and lean production

First variable	Second variable	Correlation coefficient	Significance level	Test result
Knowledge sharing	Performance	0.839	0.000	Maintained

According to the table 6, Pearson correlation coefficient between knowledge sharing and performance is 0.839 at significance level of 0.000. Therefore, there is a positive significant correlation seen between the two variables. Thus,  $H_0$  is rejected; while,  $H_1$  or research hypothesis is maintained at 0.95. It concluded that there is a direct relationship between knowledge sharing and performance.

**Fifth hypothesis:** There is a relationship between knowledge function and performance.

Table 7 Summary of Pearson correlation coefficient test on knowledge function and lean production

First variable	Second variable	Correlation coefficient	Significance level	Test result
Knowledge function	Performance	0.803	0.000	Maintained

As seen in the table 7, Pearson correlation coefficient between knowledge function and performance is obtained 0.803 at the significance level of 0.000; thus, there is a positive significant correlation between the two variables. Hence,  $H_0$  and  $H_1$  i.e. research hypothesis are rejected and maintained, respectively at 0.95. It inferred that there is a direct relationship between knowledge function and performance.

The research applied a multiple linear regression model to explain contribution of knowledge management dimensions in performance. The results are shown as follows.

Table 8 Estimated regression model

Durbin-Watson	Standard Error of the Mean (SEM)	Adjusted coefficient of determination	Coefficient of determination	Correlation coefficient
1.81	0.3406	0.804	0.817	0.82

As seen in the table 8, general correlation coefficient of dependent and independent variables is 82%. Further, coefficient of determination equals 0.817 showing how dependent variable is explained through independent variables. In other word, 81.7% of changes in performance are related to knowledge management dimensions.

Of critical issues of a multiple regression is the autocorrelation of independent variables, which is measured by Durbin-Watson statistics in the above table. If the statistics is in the range of 1.5-2.5, it means that there is no correlation between the variables. The statistics obtained 1.81 according to model estimations; hence, it concluded that there is no autocorrelation between research independent variables.

Table: Analysis of variance

Sample	Sum of squares	Degree of freedom	Mean square	F	Significance level
Regression	928.454	5	214.5136	20.641	0.001
Remaining	1062.854	126	3.284		
Total	2302.102	131	-		

It is also assumed that the regression model is significant; this significance is calculated by F statistics, as seen in the above table. P-value of this statistics is 0.001 indicating that the regression model is significant at 0.99.

## Conclusion

Organizations of the third millennium refer to the notion of human capital. Human resource development is considered the secret of sustained enterprises. Technology is no more the only major business challenge; rather, utilizing intelligent human labor and talented human capital is the main secret of dealing with challenges. Along with increasingly economic, social, and cultural development and evolutions influencing all dimensions and basics of the organizations and creating new expectations, managers' and leaders' roles and commitments underwent remarkable changes, too. In recent decades, organizations experienced fundamental evolutions leading to innovative management skills and approaches, the most significant of which is knowledge management requiring to be concentrated by various groups of micro and median industries. Moreover, the variables such as staff participation in scientific societies, participation in training courses, as well as cooperation of production organization to different universities and research centers may improve knowledge acquisition trend in the organization and consequently, it may enhance production system, too. Knowledge management may aid the organization to gain insight through its experiences and concentrate on knowledge acquisition, saving, and using in order to take the benefits of this knowledge for dynamic training, strategic planning, and decision making. All these variables commonly share human factor; therefore, it is recommended that production firms pay serious attention to their staffs and provide them knowledge acquisition opportunities so that knowledge management is improved.

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