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Study the Impact of Dimensions of Production on Process Efficiency and Organizational Performance (Case Study: Tile Kazheh Company West Islamabad)

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Abstract: Core and engine of any organization is the section of production and operation of the organization and considering the importance of production and operations section at a company level and even at the national level, Strategies should be developed and implemented in accordance with that to achieve organizational goals. The aim of this study was to examine the impact of production dimensions on process efficiency and organizational performance based on structural equation modeling in Tile Kazheh company in West Islamabad. research method, according to the purpose, is functional and according to the types of variables is quality and in terms of the relationship of variables is causal and in particular is based on structural equation modeling by using Amos software. Statistical population is employees of Tile Kazheh company in West Islamabad That the population size is 150 people. Data collection method is complete census and tools for data collection is researcher made questionnaire in Likert scale that its content validity was confirmed by five university professors, overall reliability of the questionnaire is 0/87. Findings of this study suggest that amount of effect dimensions of the production on the process efficiency is 0/63 and amount of effect of Process efficiency on organizational performance in the final model is 0/62. In the studied model amount of fitting indicators (CFI = 0/91 and NFI = 0/9 and RMSEA = 0/079) represents the suitability of the model. Hence, it is recommended that the company pay attention to specialized training to enhance professional skills and knowledge of employees in their Strategic programs.

Key words: Production dimensions, process efficiency, organizational performance, Kazheh Tile company

INTRODUCTION

Manufacturing practices have generally been categorized into plants and equipment, manufacturing systems, quality management and new product development (product development and innovative practice and concurrent engineering and logistics) (Flynn *et al*., 1995; Voss *et al*., 1995; Kadipasaoglu *et al*., 1999; Laugen *et al*., 2005; Wiengarten *et al*., 2011). Fierce competition within the global market requires the continuous improvement of manufacturing processes and practices (e.g., facilities, equipment and systems) that comprise a company's operations (Tracey *et al*., 1999; Murugesan *et al*., 2012; Terziovski and Guerrero, 2014). Further, to maximize manufacturing operational efficiency, firms have engaged in a number of innovative practices related to distribution, service provision and environmental protection (Rho and Yu, 1998; Kadipasaoglu *et al*., 1999; Wiengarten *et al*., 2011; Schoenherr, 2012; Murugesan *et al*., 2012). As a consequence, organizations must strive to reduce set up and throughput times, increase the efficiency with which they utilize their plants and equipment and increase the rate with which they invest in their manufacturing facilities, employees and manufacturing systems Lee *et al*., 2015). Because of its implications for reducing overhead costs and maximizing operational capacity, process efficiency represents one of the most signifcant objectives in the manufacturing industry. To enhance process efficiency and improve organizational performance, organizations develop novel manufacturing practices through existing systems on the basis of established international manufacturing practices or emerging practices within the market (Nemeth and Cook, 2007).

Industry of study case is one of important and active industries in manufacturing and production field of tiles types. Results of this study is regulations for move into

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industry progress and strategies formulation for production of tiles types and which whether can for increase process efficiency and organizational performance use of production dimensions is still controversial of administration scholars.

Theoretical foundations: To achieve their goals through their capabilities such as plant and equipment, manufacturing system and/or quality. To achieve these goals and improve existing manufacturing programs, organizations strive to develop existing capabilities, invest in employees or capital and/or benchmark in an effort to improve their existing system or program from well-known manufacturing practices which are used by a successful leading international company (Lee *et al*., 2015). Many manufacturing quality programs such as Total Quality Management (TQM), Six Sigma and Statistical Quality Control (SQC) are effective metrics for improving organizational processes within a given country's cultural boundaries. For example, the Iida Factory, one of Japan's leading facilities for ventilator production, makes competitive products through the use of factory automation. It has combined several technologies to design and implement automated, high-efficiency, high-precision production lines to improve process efficiency. Thus, process efficiency is derived from an entire operational process that increases productivity, improves quality and reduces setup and response time (Lee *et al*., 2015). In addition to the intraorganizational factors that affect manufacturing practices, recent research has also identified factors in the greater manufacturing environment (including emphases on social responsibility) as predictors of business practices in the manufacturing industry. For example, many organizations seek to acquire environmental management certification such as that offered by the International Organization for Standardization (ISO) 14000, to minimize the manufacturing effects that are detrimental to the environment. Further, many firms are mandated to comply with applicable laws, regulations and other environmentally oriented requirements (Lee *et al*., 2015). By streamlining activities that contribute to process efficiency, a firm is able to increase the speed and consistency with which it engages in businesses-related activities (Rho and Yu, 1998). Efficiency in general, describes the extent to which time, effort orcost iswell used for the intended task or purpose. Efficient organizations are able to respond to operational changes to provide customers with desired products or address problems associated with a rapid surge in demand (Jacobs *et al*., 2010).

Research model and relationships among constructs

Research purposes

Overall objectives:

- Understanding the impact of dimensions of production on the process efficiency
- Understanding the impact of process efficiency on the Organizational Performance

Specific goals:

- Determine the impact of production equipment on the efficiency process
- Determine the impact of production system on the efficiency process
- Determine the impact of production quality on the efficiency process
- Determine the impact of production environment on the efficiency process
- Determine the impact of efficiency process on the Operational Performance
- Determine the impact of efficiency process on the Quality performance

Research hypotheses

Overall hypotheses

- Dimensions of production has positive and significant impact on the process efficiency
- Process efficiency has positive and significant impact on the organizational performance

Specific hypotheses:

- Production equipment has positive and significant impact on the efficiency process
- Production system has positive and significant impact on the efficiency process
- Production quality has positive and significant impact on the efficiency process
- Production environment has positive and significant impact on the efficiency process
- Efficiency process has positive and significant impact on the operational performance
- Efficiency process has positive and significant impact on the quality performance

Background: Lee *et al.* (2015) conducted study entitled impact of investments in modes of production on process efficiency and performance in 1074 company (in 22 countries) and came to this result that investing in production methods (machinery, equipment, systems,

quality and environmental) had influenced on process efficiency and organizational performance and in addition to increasing process efficiency, associated with improve organizational performance (operational and quality performance). Turkoz and Akyol (2008) examined the effect of internal marketing on organizational performance and the result was a positive relationship between the tendency towards internal marketing and organizational performance. Amoako-Gyampah and Acquaah (2008), business strategy leads manufacturing strategy into operational decisions which have an impact on firm performance. Manufacturing strategy and business strategy firm must be coordinated. Judge and watanebe (1993), in his research showed that: Job satisfaction can improve Quality of performance, Reduce absenteeism and Defer the work, reducing burnout, improve physical and mental health and satisfaction with life. Galue (1990) In a study entitled (check Negligence in the workplace) at the University Tolaneh achieved the following results: Negligence in the workplace may potentially leave a negative impact on employees and the efficiency of organizations. But despite this issue, there are few studies to identify the determining factors in employees' negligence.

MATERIALS AND METHODS

Research method: This study according to the purpose, is functional and according to the types of variables is quality and in terms of the relationship of variables is causal.

The introduction of statistical population and sample and their volume: The statistical population of this study consisted of 150 personnel (administrative 15 and operational 135) of Tile Kazheh that data has been collected by complete census.

Methods and tools for data collection: Libraries procedure: books and technical papers and searching online databases have been used to collect information about the literature and research background and in the field method in order to collect data field method has been used in the study of dimensions of production on process efficiency and organizational performance. In this research, researcher made questionnaire has been used in five Likert scale.

Validity and reliability: Validity of the questionnaire was investigated through the content validity. Thus, after preparing the questionnaire, a sample of it was presented to study and comment to professors in management, questions were reviewed after getting feedback and reform from them and Cronbach's alpha was used for reliability of the questionnaire (Table 1).

Table 1: Cronbach's alpha

Components	Cronbach's alpha
dimensions of production	
Equipment	0/91
System	0/88
Quality	0/87
Environment	0/75
Process efficiency	
Process efficiency	0/92
Organizational performance	
Operational performance	0/89
Quality performance	0/86
Total	0/87

Reliability was confirmed according to alpha obtained for all variables that are more than 0/7

Table 2: Kolomogrov-Smirnov (K-S) test

Variables	Sample size	Test statistics	p-values
Dimensions of production			
Production equipment	150	0/745	0/190
Production system	150	0/586	0/155
Production quality	150	1/125	0/455
Production environment	150	1/852	0/251
Organizational performance			
Operational performance	150	0/856	0/352
Quality performance	150	1/251	0/125
Process efficiency			
Process efficiency	150	1/125	0/087

Table 3: Identification guide of abbreviations variables in the model

Variables	The variable name in English	Abbreviations symbol
Production equipment	Production Equipment	PE
Production System	Production System	PS
Manufacturing Quality	Manufacturing Quality	MQ
Production environment	Production Environment	PRE
Process efficiency	Process Efficiency	PEF
Operational Performance	Operational Performance	OP
Quality performance	Quality Performance	QP
Organizational Performance	Organizational Performance	ORP
Dimensions Production	Dimensions Production	DP

Methods and tools of data analysis: Data analysis in two parts: descriptive and inferential statistics was took place by using the SPSS Software Version 22 and Amos. Demographic characteristics were analyzed by spss software and software Amos structural equation was used to correlation coefficient and test hypotheses.

Normality of variables: Kolomogrov-Smirnov test was used for examine the assumption of normality of the study variables. The results show that can not Rejected the assumption of normality for all variables (Table 2-4).

According to Table 4, achieved significant level was less than 0/05 and it was determined that there is a

Table 4: The correlation coefficient between the variables

Statistics	Symbols	PRE	MQ	PS	PE	DP	PEF	ORP	QP	OP
	PRE	1.000								
Correlation	MQ	0.493	1.000							
Sig.		0.002								
Correlation	PS	0.481	0.670							
Sig.		0.003	0.004							
Correlation	PE	0.389	0.562	0.502	1.000					
Sig.		0.001	0.002	0.003						
Correlation	DP	0.465	0.424	0.478	0.362	1.000				
Sig.		0.001	0.001	0.002	0.003					
Correlation	PEF	0.710	0.508	0.206	0.332	0.522	1.000			
Sig.		0.030	0.010	0.004	0.020	0.010				
Correlation	ORP	0.470	0.316	0.361	0.580	0.324	0.621	1.000		
Sig.		0.002	0.001	0.020	0.001	0.020	0.004			
Correlation	QP	0.554	0.372	0.425	0.243	0.382	0.756	1.000		
Sig.		0.020	0.010	0.002	0.001	0.030	0.020	0.002		
Correlation	OP	0.482	0.324	0.370	0.211	0.332	0.637	0.396	0.466	1.000
Sig.		0.003	0.001	0.020	0.030	0.001	0.001	0.003	0.002	

Table 5: The results of amount compliance of the research model with fit indexes

Abbreviations symbol	The full name of fit index	Concept	Desirable criteria	Reported value
χ^2/df	Root Mean Square Error of Approximation (RMSEA)	Root mean square error of approximation	3 and less	Feb-99
RMR	Chi-degree freedom	Relative normalized index	<0/05	0/036
GFI	incremental fit index	Incremental fit index	0/9 and higher	0/91
AGFI	Normed fit index	Normalized fit index	0/9 and higher	0/92
NFI	Goodness of fit	Goodness of fit index	0/9 and higher	0/95
NNFI	Adjusted goodness of fit	Adjusted goodness of fit index	0/9 and higher	0/90
CFI	Comparative Fit Index	Comparative fit index	0/9 and higher	0/91
RMSEA	Root Mean Square Error of Approximation (RMSEA)	Root mean square error of approximation	<0/08	0/079

Table 6: Path hypothesis, along with critical ratios, standard error and significance level

Path relationship	Load factor	Standard error	Critical ratios	Significance level	Results
Process efficiency←Dimensions of production	0/630	0/052	11/210	0/007	Lack of rejection
Organizational Performance←Process efficiency	0/620	0/065	10/280	0/000	Lack of rejection
Process efficiency←Production equipment	0/590	0/055	9/755	0/009	Lack of rejection
Process efficiency←Production system	0/550	0/065	6/755	0/000	Lack of rejection
Process efficiency←Production quality	0/560	0/068	6/951	0/000	Lack of rejection
Process efficiency←Production environment	0/580	0/053	10/397	0/000	Lack of rejection
Operational performance←Process efficiency	0/640	0/058	10/706	0/000	Lack of rejection
Quality←Process efficiency	0/730	0/052	13/931	0/000	Lack of rejection

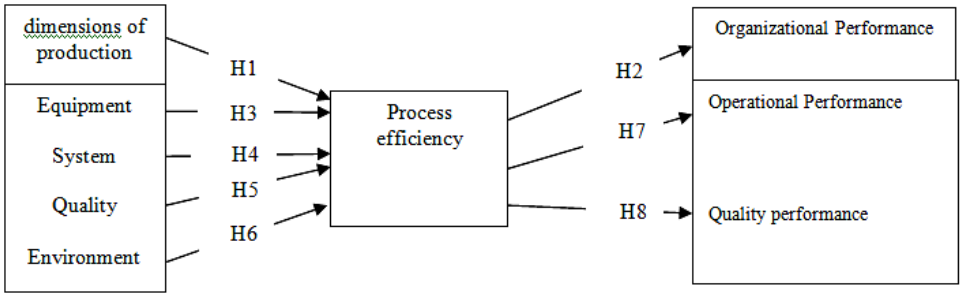

Fig. 1: Conceptual model (Lee *et al*., 2015)

significant correlation between the variables. The greatest relationship between process efficiency and quality performance is 0/756 that relationship is very strong and direct ,and the lowest relationship between the Production System (PS), Process efficiency (PEF) is 0/206 that relationship is direct and weak (Fig. 1-9 and Table 5-6).

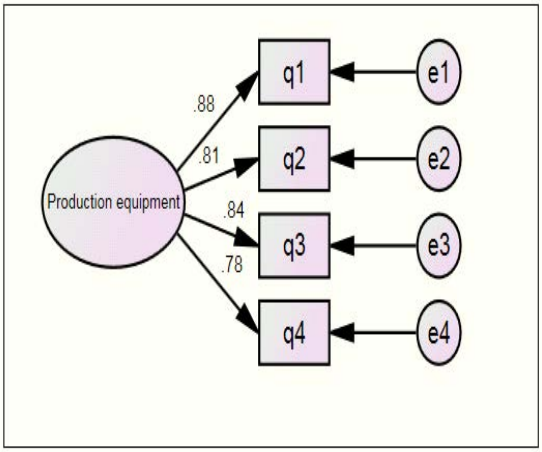

Fig. 2: Standard measurement model production equipment

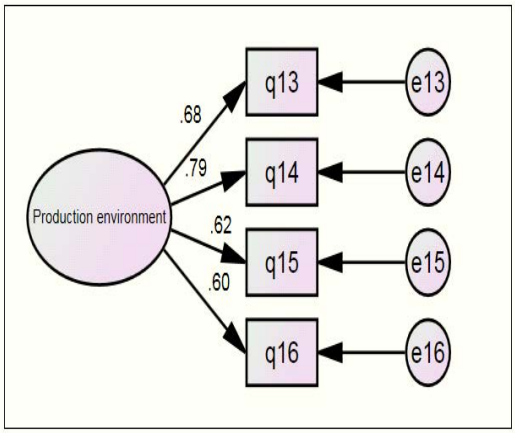

Fig. 5: Standard measurement model production environment

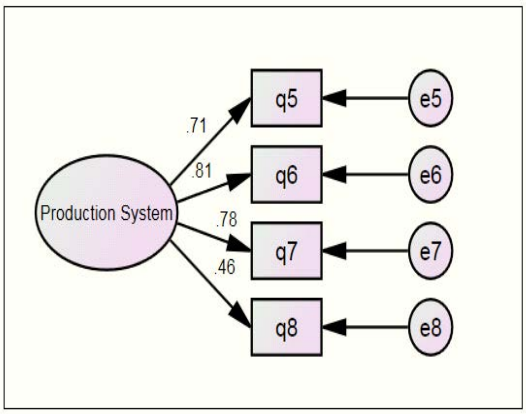

Fig. 3: Standard measurement model production system

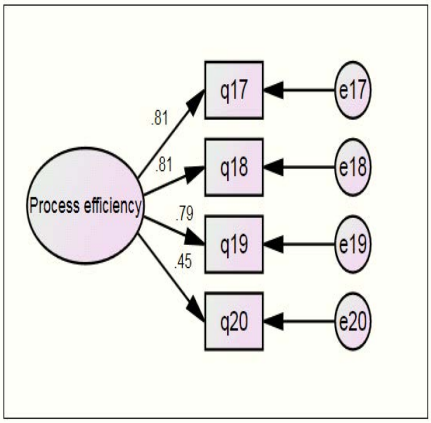

Fig. 6: Standard measurement model process efficiency

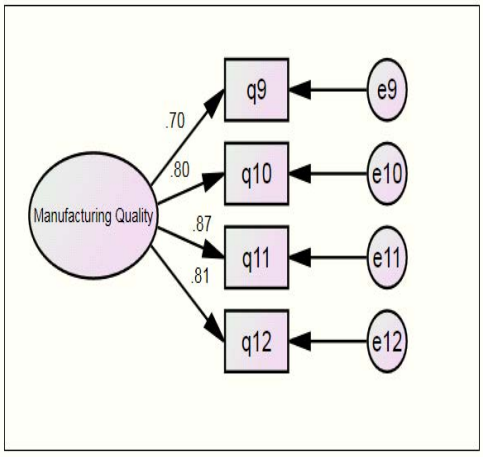

Fig. 4: Standard measurement model production quality

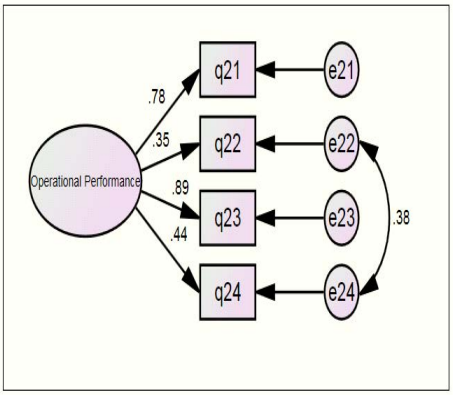

Fig. 7: Standard measurement model operational performance

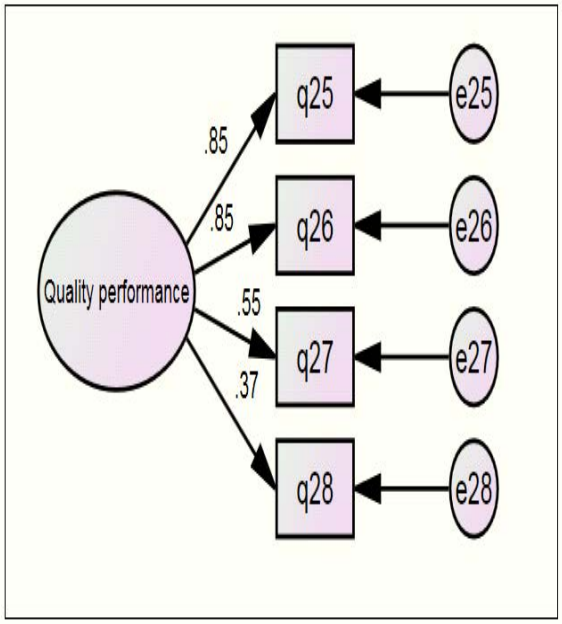

Fig. 8: Standard measurement model quality performance

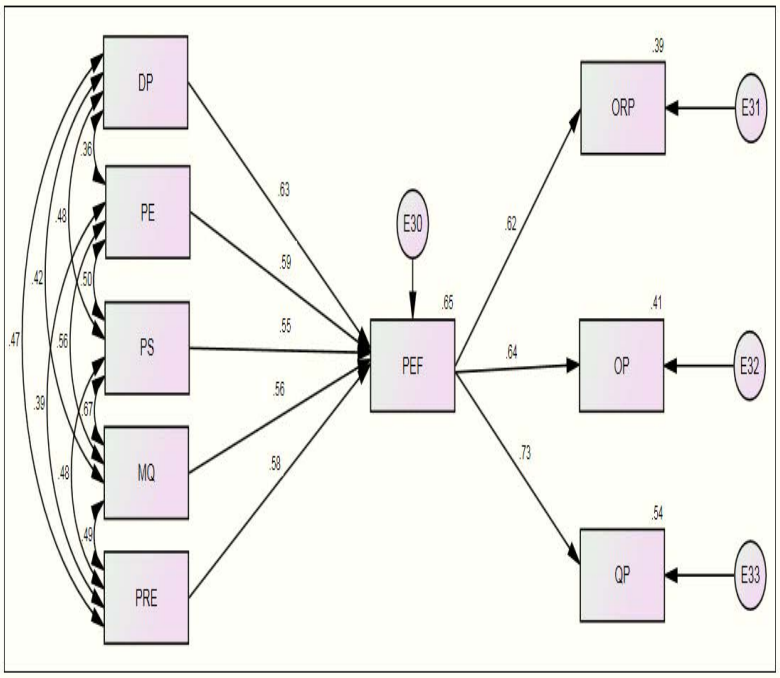

Fig. 9: Standard parameter of the model

RESULTS AND DISCUSSION

First hypothesis

- H_0: dimensions of production doesn't have significant impact on the process efficiency
- H_1: dimensions of production has significant impact on the process efficiency

According to Table 6 and achieved significant level at (0/007) that is less than 0/05, it was found that the

dimensions of production has ability to predict process efficiency. In other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/63, namely by changing one unit in dimensions of production, process efficiency changes 0/63 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al.* (2015).

Second hypothesis:

- H_0: process efficiency doesn't have significant impact on organizational Performance
- H_1: process efficiency has significant impact on organizational performance

According to Table 6 and achieved significant level at (0/000) that is < 0/05, it was found that the process efficiency has ability to predict organizational Performance, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/62 namely by changing one unit in process efficiency, organizational Performance changes 0/62 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al*., (2015).

Third hypothesis:

- H_0: production equipment doesn't have significant impact on process efficiency
- H_1: production equipment has significant impact on process efficiency

According to Table 6 and achieved significant level at (0/009) that is <0/05, it was found that the production equipment has ability to predict process efficiency, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/59 namely by changing one unit in production equipment, process efficiency changes 0/59 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al.* (2015).

Fourth hypothesis:

- H_0: production system doesn't have significant impact on process efficiency
- H_1: production system has significant impact on process efficiency

According to Table 6 and achieved significant level at (0/000) that is < 0/05, it was found that the production system has ability to predict process efficiency, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/55 namely by changing one unit in production system, process efficiency changes 0/55 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al.* (2015).

Fifth hypothesis:

- H_0: production quality doesn't have significant impact on process efficiency
- H_1: production quality has significant impact on process efficiency

According to Table 6 and achieved significant level at (0/000) That is less than 0/05, it was found that the production quality has ability to predict process efficiency, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/56 namely by changing one unit in production quality, process efficiency changes 0/56 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al*., (2015).

Sixth hypothesis:

- H_0: production environment doesn't have significant impact on process efficiency
- H_1: production environment has significant impact on process efficiency

According to Table 6 and achieved significant level at (0/000) . That is < 0/05, it was found that the production environment has ability to predict process efficiency, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/58 namely by changing one unit in production environment, process efficiency changes 0/58 and according to being positive number, there is impact as well positive and direct. This results have not alignment with other results.

Seventh hypothesis:

- H_0: process efficiency doesn't have significant impact on operational performance
- H_1: process efficiency has significant impact on operational performance

According to Table 6 and achieved significant level at (0/000) that is < 0/05, it was found that the process efficiency has ability to predict operational performance, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/64 namely by changing one unit in process efficiency, operational performance

changes 0/64 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al.* (2015).

Eighth hypothesis:

- H_0: process efficiency doesn't have significant impact on quality performance
- H_1: process efficiency has significant impact on quality performance

According to Table 6 and achieved significant level at (0/000) that is < 0/05, it was found that the process efficiency has ability to predict quality performance, in other words, H_0 is rejected and H_1 hasn't been rejected and the extent of this impact is 0/73 namely by changing one unit in process efficiency, quality performance changes 0/73 and according to being positive number, there is impact as well positive and direct. This result aligned with previous results of Lee *et al.*, (2015).

CONCLUSION

Organizational performance is a complex phenomenon which perhaps know the simplest explanation the set of activities focused on organizations achieve. Commensurate with performance which will be studied various valves, the objectives occurs from the various valves can be expressed function according to mentioned definition which is ability of the system to measure the achievement of results associated with the evaluation objectives (Rus *et al*., 2012).

RECOMMENDATIONS

First hypothesis: The relevant authorities have paid more attention to quality control department and standards compliance.

Second theory: Authorities expand people with knowledge and skills in the units under their command.

Third hypothesis: company in a number cases, instead of buying truck that can be costly can hire several truck.

Fourth hypothesis: Company with determined experts and experienced people, conduct periodic inspection of the production line.

Fifth hypothesis: Company in future plans with respect to customer's requirements, consider production of new products (creating new colors and decorative designs on tiles).

Sixth hypothesis: Company set up R&D units and identify many threats and opportunities before the outbreak and use them in ordet to improve the company situation.

Seventh hypothesis: Participatory decision making and planning in some cases to be done from bottom to top.

Eighth hypothesis: The relevant authorities consider incentive schemes such as material and spiritual rewards, loans, travel, promotion based on merit and...

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