Impact of cultural factors on enterprise resource planning

By Cemalettin HATİPOĞLU [†]

Abstract. Organizational culture can also be evaluated as an application stage for the processes and fixations that occur with communication. The lack of cooperation at the desired level may lead to a decrease in effectiveness, especially at the points where teamwork is required, and to a slower implementation. This is one of the most important factors especially for the common purpose and goal setting and for the generations of the application schedules to be generic. The expected cultural change with the ERP system in the company is that the communication and monitoring needs between the units can be met depending on the integration between the processes. During the installation, inter-departmental communication is one of the processes that must be carried out in different dimensions. However, it may be possible to provide mutual optimization between the processes and share the inconveniences. Thus, problems and methods of solution is collected in a common pool will provide opportunity to access the desired point on the same technical jargon and also potential problems the same communication language means in the other unit able to resolve this quickly and both costs and expected benefits. We can summarize the purpose of the research under the heading below: Determine the positive or negative relationships of the cultural factors required for more effective and successful ERP establishment. It can help to ensure that found relationships are taken into consideration in project planning for establishing business and consulting entities. Identifying Cultural Factors for ERP implementations as a guide to management and setting out the performance measurement system for ERP.

Keywords. Organizational culture, ERP system, Cultural factors.

JEL. M11, M14, M15.

1. Introduction

In recent years, technological development and change as a natural result of this progress have affected our lives. These developments and innovations have gradually gained speed and have been part of our lives. Enterprises, which desire to expand and continue their existences, must adapt these technological developments. Enterprises can reach their specified targets if they utilize available resources in most efficient way and integrate technological developments into their systems in accordance with their objectives.

In order to give the right decisions in a company, departments such as marketing, manufacturing, human resources, accounting, and warehouse must be operated with integrated way and efficient management of information in the company must be conducted. In order to achieve these objectives, enterprises have started using ERP (Enterprise Resource Planning) Systems. There are many benefits of implementing an ERP System for enterprises. Implementation of ERP provides firms with cost reduction, time saving, support of information network and unity among systems inside enterprises.

By means of implementing ERP Systems, enterprises can be healthier against changes occurred in markets. On the other hand, unsuccessful implementation of

[†] Bilecik University, FEAS, Bilecik, Turkey.

☎. +90 228 214 1580

✉. cemalettin.hatipoglu@bilecik.edu.tr

an ERP System cause enterprises to lose a great deal of fund and effectiveness or to fail since ERP is a quite complex and expensive system and it is not easy to remove changes made by ERP in a company.

2. Enterprise resource planning

ERP is a software system which provides planning of supply, manufacturing and distribution of resources located on different geographical regions in active and efficient way, coordinating and controlling of customer demands in most appropriate way in accordance with enterprise's strategic targets and objectives (Matolcsy *et al.,* 2005:163).

The concept of ERP can be described as follows (Klaus *et al.,* 2000):

• ERP is a commercial commodity, which can be purchased and sold as computer software.

• ERP is a development tool that gathers entire process and data of a corporation under a single far-reaching and integrated structure.

• ERP is a key element of a substructure, which offers solutions to business process. It automatizes and integrates business process.

• ERP enables to share common data and applications in entire enterprise.

• ERP enables to gain information and access this information in a real-time setting.

Basic technical features of ERP are as follows (Carton & Adam, 2003: 22):

• Consistent graphic interface in every field of implementation.

• A client-server architecture consisting of three layers: application, database and presentation.

• ERP is independent from operating system and hardware. ERP packages can be installed on different systems such as Solar Operating System, Windows New Technology, and Linux.

• ERP is not only the one that has complex management system. There are few systems which has vital importance as much as ERP.

Thanks to ERP, companies can integrate inter-departmental data flow. This varies from human resources management tool to information technology management. For many users, ERP is a "do it all" system including every step-from purchase order to customer service. ERP integrates manufacturing setting of organization with customers and suppliers.

Table 1. *Benefits of ERP's Implementation*

Benefits	Description
Operational Benefits	By automatizing business process and providing process changes, implementation of an ERP System provides cost reduction, time saving, efficiency increase, the increase in quality and enhanced customer service.
Administrative Benefits	Implementation of an ERP System helps enterprises to achieve a better resource management, advanced deciding and improved planning and performance.
Strategic Benefits	Implementation of an ERP System with its wide-scaled enterprise commitment and inner/outer integration skills provides business growing, alliance, innovation, price differentiation and outer connections.
Informatics Technologies Substructure Benefits	With its integrated and standard implementing architecture, implementation of an ERP System supports business flexibility, capacity increase for quick implementation of new applications and reduction of informatics cost and marginal cost of information technologies belonging to business units.
Organizational Benefits	Implementation of an ERP System expands organizational capacity by supporting organizational support change, ease employee learning, authorizes workers and integrates common views.

Source: Seddon *et al.,* (2003).

3. Cultural factors in ERP implementation

Even though two companies implement the same ERP packages, results may be different (Seddon *et al.,* 2003). Technical problems can be analyzed and solved by

computers and experts but it is not easy to handle human factors with only codes and programs. Cultural issues at the company have a non- negligible impact on the success of ERP implementation.

In ERP implementation, cultural issues can be analyzed under three parts: corporate culture, effective communication, and cultural differences among vendors, consultants and customers.

3.1. Corporate Culture

Nah *et al.* (2001) asserts that the corporate culture is an important success factor for enterprises. Corporate culture consists of three layers. In outer layer, there are values about objectives, strategies and missions of the organization. In mid-layer, there are beliefs of employees of the organization. In inner layer, there are assumptions over corporation life. All these cultural issues constitute organizational culture and corporate culture.

Corporate culture is a conductor to success. As a strategic solution, ERP Systems change working style of people. Innovative and transparent corporate culture ensures participation of users during implementation process. A transparent and creative culture sees its employees as a main source of creating ideas, movement and performance. This also creates a continuous work environment which reinforces loyalty of employees (Ross *et al.,* 2003; Kuang *et al.,* 2001).

3.2. Effective Communication

Communication effectiveness is a key issue for both corporate and individual success. Falkowski *et al.,* (1998), Holland & Light (1999), Sumner (1999) and Rosario (2000) point out that effective communication is a critical success factor for enterprises.

Effective communication enables new system to penetrate into organization. Responsibilities and roles need to be changed according to new needs of ERP system. At various phases of implementation process, it is important for employees to understand what changes, why it changes and how it helps organization. Communication effectiveness increases the willingness of employees to adapt the new system. Constant communication also helps avoiding any resistance against implementing new systems within the company. For this reason, effective communication must be established and developed together with implementing ERP systems in the organizations.

On the other hand, communication and interaction between inner groups and outer groups (vendors and consultants) cannot be ignored. Good communication maximizes support from vendors and consultants and enhances efficiency of ERP implementation.

3.3. Cultural Difference

Cultural difference is critical success factor for the successful implementation of ERP systems (Krumbholz *et al.,* 2000). Once software is implemented, possible problem is the issue of incompatibility. Corporations must make a choice between business process which constitutes corporate culture and business process suitable for ERP systems.

Corporations must take cultural difference among vendors, consultants and themselves into consideration before deciding on which ERP package is purchased and implemented. Otherwise, they have to rescale their projects and expect minimum benefit from implementation (Marcus & Tanis, 2000:11).

4. Research Objective and Sample

For enterprises, efficient usage of ERP system is as important as successful implementation of ERP systems. Considering that implementations of ERP systems are quiet costly, efficient usage of ERP systems are important. However, many enterprises fail to successfully implement ERP systems. Our research objective is

to analyze factors effecting successful implementation of ERP system in enterprises. Our sample includes 113 manufacturing enterprises operating in organized industrial zones in Bilecik, Eskişehir and Ankara provinces.

5. Empirical Analysis

SPSS 17.0 for Windows package program was used to evaluate the research data. The confidence level is taken as 95% in all analyzes. Clustering analysis (K-Means for Cluster), T-Test analysis (Independent Sample T-Test), and Regression analysis are carried out.

5.1. Clustering Analysis

Clustering analysis indicate that 72 enterprises can be considered as successful while 41 enterprises can be considered as failed enterprises out of 113 enterprises conducted survey questions.

Table 2. *Clustering Analysis*

Successful Enterprises	72
Failed Enterprises	41
Total	113

5.2. T-Test

Hypothesis 1: Cultural factors affect positively Enterprise Resource Planning implementations.

Hypothesis 1a: Organizational culture affects positively on effective communication, cultural discrimination and Enterprise Resource Planning implementations.

When hypotheses were tested, a T-Test (Independent Samples T-Test) was performed to compare the means of independent samples and to determine whether the associated population means are significantly different. Our survey includes four questions to determine whether performance criteria such as organizational culture, efficient communication, and cultural difference affect efficient implementation of ERP systems. T-test were conducted to determine whether means are significantly different in success situations. Table 3 presents T-Test results. Results of t-values and p-values indicate that performance criteria such as organizational culture, efficient communication and cultural difference aren't significant performance criteria in ERP implementation.

Table 3. *T-Test (Organizational Culture, Efficient Communication, Cultural Discrimination)*

Variables	Number of Firms	Mean	Standard Distribution	t-Value	Degree of Freedom	Probability Value
What level of user's limitation is during ERP implementation?						
Successful	72	3.74	0.750	0.552	111	0.582
Failed	41	3.66	0.656			
To what extent does the management become aware of user limitation?						
Successful	72	3.78	0.716	-0.019	111	0.985
Failed	41	3.78	0.725			
To what extent does the management report the needs for new system?						
Successful	72	3.83	0.751	-1.296	111	0.198
Failed	41	4.02	0.758			
To what extent is the management active in reducing user's limitation?						
Successful	72	3.82	0.775	-0.221	111	0.826
Failed	41	3.85	0.823			

5.3. Regression Analysis

Regression analysis is conducted in order to determine whether the ERP implementation project will be successful or not by using variables belonging to

cultural factors. Result values of the established model are given in Table 4, 5 and 6 below. Results support T-Test results.

Table 4. *Summary of the Model*

R	R²	Regulated R²	Standard Error
0.130	0.017	-0.020	0.488

Table 5. *ANOVA*

	Squares Total	Degree of Freedom	Squares Average	F Test	Probability Value
Regression	0.441	4	0.110	0.464	0.762
Residual Value	25.683	108	0.238		
Total	26.124	112			

Table 6. *Coefficients*

Model Dependent Variable	Non-Standardized Coefficients		Standardized Coefficients	T value	Probability Value
	Beta	Standard Error			
Fixed Value	1.101	0.517		2.130	0.035
Q1	-0.026	0.068	-0.039	-0.389	0.698
Q2	0.002	0.068	0.003	0.030	0.976
Q3	0.075	0.062	0.117	10.199	0.233
Q4	0.015	0.061	0.025	0.256	0.798

Note: Q1: What level of user's limitation is during ERP implementation? Q2: To what extent does the management become aware of user limitation? Q3: To what extent does the management report the needs for new system? Q4: To what extent is the management active in reducing user's limitation?

6. Conclusion

Corporations need to be managed efficiently in order to survive and sustain their profit level in such an economic environment that there has been a global competition and a changing economic process. In order to give right strategic decisions and gain competitive advantage, an integrated system is needed to be adapted by firms. Implementation of ERP systems is a popular competition tool. However, a company must analyze its own capacity and industry in order to benefit from this technology. First of all, an enterprise needs to determine whether ERP is a true technology to enhance its competitive proficiency or not. Managers must analyze the needs of the firms and make well planning. It must be analyzed whether the company should invest in such a system whereby benefits and cost of ERP system should be inspected. Then, critical success factors should be evaluated. It should be kept in mind that high performance increase as a result of ERP implementation takes long time.

Our study reveals that organizational level of team managers is not a statistically significant factor in successful ERP implementations. Rather, support of top management has an important impact on the success of ERP implementations. General Manager or chairman's direct involvement and management of the implementation process and supervision of the cost of the implementation process affect the success of ERP implementations. Another important factor which affects the probability of success of ERP implementation is the selection of implementation methods. Besides, vendors and employees should be trained before implementing ERP systems.

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