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Investigating the enterprise resource planning (ERP) system and the feasibility study of implementing this system in the IT department of the Ministry of Industry, Mine and Trade

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ABSTRACT

The process of using and implementing the enterprise resource planning (ERP) systems is a technical-social challenge with an impact on the strategic and operational levels of the organization that does not necessarily produce the expected results of the adopting organization. Therefore, before implementing ERP, it is necessary to assess the organization's readiness for its implementation. An organization must determine its current situation and the factors affecting the organization's readiness for the successful ERP implementation prior to its actual implementation. By review of the conducted research, the factors associated to the readiness of the IT department of the Ministry of Industry, Mine and Trade were identified and a total of 23 partial factors pertaining the organizational readiness for the ERP system implementation were identified. Next, a questionnaire was prepared by the author to measure the relative importance of each of these factors. The results indicate that the effect of the 7-S factors on organizational readiness may not be the same so that the effects of dimensions Strategy and Shared values with a mean rank of 5.18 and 5.09, respectively, were the highest, while the effect of the dimension Staff was found to be the lowest.

KEYWORDS: enterprise resource planning (ERP), integrated system, ERP implementation readiness assessment

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1. Introduction

The enterprise resource planning (ERP) system is software that can be used to integrate information among all the operations of an organization in order to automate the integrated processes of the organization. In fact, it is a management system that integrates all levels of business (Yeganegi et al, 2020).

These softwares, contrary to the old softwares that were developed in organizations and through different organizational units, are an integrated collection so that whenever there is a need to add another module to them, this is done easily. The ERP architecture and structure is of such quality that provides information integrity and comprehensiveness at the organization level and ensures the smooth flow of information between different departments of the organization (Kembaren, 2020).

The purpose of the ERP system is to put together and integrate the parts that an organization needs to carry out its activities (Jahanyan and Rezaei, 2018).

Small and medium-sized enterprises (SMEs) are experiencing a fundamental leap towards cloud ERP systems. These systems can organize and store data remotely, adopt a "pay-as-you-go" method, and employ a method that provides relevant information through a cloud computing platform. Therefore, it makes the cloud ERP system very efficient for the stability and survival of organizations, enabling them to compete in today's competitive market (Sabet & Ayazi, 2017).

Despite all the advantages of this system for the organization, it should be first determined whether the studied organization is ready to implement this system or not. It should be noted that the ERP system is mainly based on the process orientation philosophy and incorporates all organizational processes and may involve their transformation (Ince et al, 2013).

This system also interacts with most of the organization's employees, that is, this approach requires changes in cultural, human, technical, structural and process dimensions throughout the organization. Therefore, its implementation faces certain complications and requires considerable time and resources (Tarigan et al, 2021).

This research seeks to examine the ERP system in terms of its feasibility in the organization and organization's readiness for successful implementation of this system, along with the knowledge of the conditions and effective factors in this process, given the current state of the IT department of the Ministry of Industry, Mine and Trade.

2. Theoretical framework

This system covers all the departments of the company from finance, accounting, human resources, maintenance and repairs to service management and transportation. In fact, ERP systems are mutable and adjustable information systems that integrate information and information-based processes in the organization within and between organizational units (Bandoly & Schoenherr, 2005).

In general, many factors play a role in the application of integrated management systems. In this research, McKinsey's 7-S model has been used. This model was proposed by Tom Pitterz and Robert Waterman in the early 80s (Acar et al, 2017). The proposed model by them is based on the fact that if an organization wants to achieve success, its 7 internal aspects, which are termed McKinsey's 7-S model, must be in harmony with each other. The 7-S model was adopted by McKinsey experts to analyze more than 70 organizations simultaneously, and it was subsequently used by many researchers and research institutes (Heidari et al, 2018). This model includes 7 variables or levers. which all begin with S, which include: strategy, structure, systems, skills, management style, staff, and shared values (Ramzgoian et al, 2016).

Structure: refers to organizational charts and reporting levels information.

Strategy: consists of plans to achieve set goals and planned actions and decisions.

Systems: refers to daily business activities, including the main processes and supporting systems.

Skills: are distinct capabilities and competencies of the organization's employees.

Management style: consists of dominant values and beliefs and developed skills that have become permanent characteristics of organizational life.

Staff: the type and number of personnel of the organization and the methods of their development, as well as their characteristics in terms of education, functional principles or work fields, and the mode of human resources management.

Shared values: are beliefs, convictions and assumptions that shape the behavior of people in the organization and organizational culture (Aydiner et al, 2020).

Assessing and determining the organization's readiness in based on these 7 factors will easily reveal possible problems and risks that may arise during the establishment and implementation of the ERP system and will enable the organization by thinking of solutions to resolve the problems and weaknesses in parts of the organization and provide the ground for the establishment of the ERP system.
This model was examined and analyzed by Dr. Hanafizadeh and Dr. Rouhani in a research titled A McKinsey 7S Model-Based Framework for ERP Readiness Assessment (Peri et al., 2008).

3. Research methodology

This is an applied research in that its expected results can be used in similar companies. It is conducted through a descriptive survey and field study.

The statistical population of this research includes 85 of the project managers and experts working in various sections of the IT department of the Ministry of Industry, Mine and Trade and the managers of the organizations that have adopted and implemented ERP. To determine the sample size of the statistical population, the Krejcie and Morgan table was used. According to this table, the sample was to the size of 70 people the individual members of which were selected using simple random sampling.

Based on the identified 23 effective partial factors in ERP readiness, an author-made questionnaire was used to measure the relative importance of each of these factors, which is organized as follows:

3 items to assess the dimension structure;
4 items to assess the dimension existing systems in the organization;
4 items to assess the dimension shared values;
3 items to assess the dimension skills of the organization and its employees;
3 items to assess the dimension strategy;
3 items to assess the dimension staff; and
3 items to assess the dimension management style.

For data analysis, Friedman's test was used to prove whether the ranks of the factors are the same or not.

4. Findings

The hypothesis of the research is that the 7 factors mentioned in McKinsey's 7S model have the same effect on the organization's ERP readiness. However, the degree to which each of these 7 factors affect organizational readiness may not be equal. This is tested by Friedman's test. The test results are shown in the following tables:

Table 1. Mean rank

Dimension	**Ranking**
Structure	3.93
Existing systems in organization	3.99
Shared values	5.09
Organization and employee's skills	3.24
Strategy	5.18
Staff	2.81
Management style	3.76

Table 2. Friedman test statistics

N	70
Chi-square	73.007
df	6
Asymp. Sig.	0.000

Considering the significance level of zero (<0.05) in the above table, the null hypothesis is rejected, that is, there is a difference between the effects of the 7 factors on the level of organizational readiness. So, with 95% confidence, we can say that the effect of these 7 factors on organizational readiness is not the same.

On the other hand, the dimensions Strategy and Shared values with a mean rank of 5.18 and 5.09, respectively, have the strongest impact and the dimension Staff has the weakest impact on ERP readiness. The obtained rankings for the effect size of these 7 factors are reported in Table 3.

Table 3. The ranking of the 7 factors

Row	Factors	Mean rank
1	Strategy	5.18
2	Shared values	5.09
3	Existing systems in organization	3.99
4	Structure	3.93
5	Management style	3.76
6	Organization and employee's skills	3.24
7	Staff	2.81

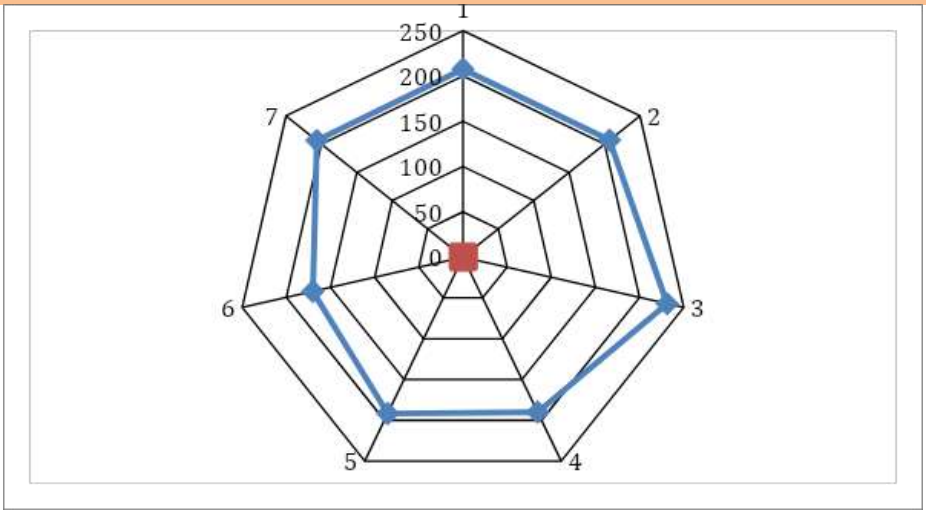

Figure 1. Radar chart of ERP system assessment

1. Structure; 2. System; 3. Shared values; 4. Skills; 5. Strategy; 6. Staff; 7. Management style

5. Conclusion

In this study, the organizational readiness for the implementation and establishment of the ERP system is investigated in the IT department of the Ministry of Industry, Mine and Trade. To identify the factors associated with organizational readiness for the ERP system implementation and deployment, extensive studies have been conducted which resulted in formulation of 23 query items within the framework of of McKenzie's 7S model, i.e. strategy, structure, systems, skills, management style, staff, and sjared values. In order to perform statistical analysis and test the hypothesis, a questionnaire was used to obtain the opinions of the 70 selected experts. After the statistical analysis, 3 dimensions were found to be the most effective in the organization's readiness for ERP implementation. Then, all the factors are ranked using Friedman's test and a practical framework is presented for this purpose. The results obtained from the ERP readiness assessment in terms of structure, management style, strategy, system, skills, staff, and shared values dimensions will easily highlight possible problem areas and risks which may arise during the ERP establishment and implementation and will enable the organization to come up with a solution to solve these problems and prepare plans for areas with weak points, and provide the ground for the system implementation and establishment. Considering the scientific and practical objectives of the present research, the findings of this research can be of use to all organizations that want to utilize this service or can conduct this type of research. Therefore, the results of this research can be used by managers and leaders of the relevant areas.

After conducting ERP readiness and feasibility studies based on the obtained results, a set of preparation plans can be defined in the organization. These plans are defined according to the needs of the organization and provide the necessary preparations for the establishment of the system in

the organization. The most important plans that can be defined and proposed to the organization are:

People preparation plan: In this plan, the necessary measures to prepare people to accept the system are defined and explained. Holding training courses, culture building and information, collaboration and change management are the most important measures that are proposed in this plan for preparing people.

Data preparation plan: In this plan, the necessary measures are taken to identify and define basic items, document data and prepare data for entering into the system. Warehouses Coding, workforce coding, and parts and machines coding are among the most important basic information items.

Infrastructure and technical platform preparation plan: In this plan, the needs and requirements of the technical infrastructure and platform for the system establishment are specified and the preparation plan for this platform is presented. Updating and developing the communication network, improving network security, equipping hardware and equipping servers and basic software are some of the measures that could be addressed in this plan.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.