



Research Article

Evaluating the Success of the Information System of Lavan Oil Refining Company

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Email: mrr15.rr@gmail.com**ABSTRACT**

This study was conducted in 2017 to assess the success of the information system of Lavan Oil Refining Company. The statistical population of the present study consists of all employees and more senior employees of Lavan Oil Refining Company; whose number is 134. The sample size was calculated using Cochran's formula and it is 100 people, which through simple random sampling, were participated in the research. The Delone and McLean's information systems questionnaire (with 24 questions), which included six indices, "Quality of the system, quality of information, service quality, rate of use, acceptance (satisfaction) of user, benefits" was used for collecting field information. The reliability of the questionnaire was confirmed by Cronbach's alpha and its validity by content validity technique. Using the two-sentence distribution technique, the research hypotheses were tested. The results showed that the quality of information and the level of employees' acceptance are not in the desired level; however, the quality of the system, the quality of services, the benefits and satisfaction of the employees are in a desirable level.

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Introduction

The present administrative system due to the inadequacies and ambiguities in systems, processes and methods of doing work, the lack of planned and systematic relationships and behaviors, and the lack of transparency of operations, as well as the dominance of habits and preferences of executives are in such a way that make the necessity of developing and improving processes and methods of doing work and automation of activities and the use of appropriate technologies inevitable [1].

Today, due to the development and diversification of products and services of organizations, as well as the intense competition between them, organizations are subject to change and transformation, and the survival of organizations depends on the organization's ability to absorb and use of information and knowledge of new technologies. Therefore, organizations sought to appropriately establish and manage information systems to acquire and disseminate information and knowledge of new technologies in a timely manner and to use it optimally [2].

Statement of the Problem

Each organization urgently needs an evaluation system in order to be aware of the desirability and quality level of its activities, especially in complex dynamic environments [3]. This is a well-accepted logic that the information system, after functionalization, should be evaluated [4].

Assessing the success level of the information management system can guide decision makers of organization to develop and improve this system [5].

The government's approach in the fourth development program and the twenty-year vision program is to prioritize knowledge-baseness and movement towards a knowledge-based economy so that in 1404, Iran becomes the first country in the Asia region in all economic, social and cultural dimensions. The realization of this evolutionary aim is conditional on the development and implementation of strategic plans, in accordance with the knowledge base, because the programs about change or transformation without the necessary infrastructures, can not be realized. This issue was addressed in article 16 of the general policies of the country's administrative system (knowledge-baseness of the administrative system through the application of the principles of

knowledge management and information integration) which was passed in April 2010 [6].

Nevertheless, evaluating the success of information systems is essential and vital in order to understand the value and efficiency of information systems and justify the large volume of investment made in establishing and developing these systems. Considering that Lavan Oil Refining Company did not investigate the success of information systems, therefore, the present study deals with this goal.

Theoretical Foundations of the Information System

In order to increase efficiency and effectiveness, information systems have been considerably taken into consideration and organizations are investing heavily in creating and developing these systems [7].

Information systems provide information required for management from the internal and external environment of the organization. Obviously, this information will be useful and effective only if it is new and up-to-date, correct and reliable, required by the manager in certain circumstances, and complete and impeccable as far as possible [8].

An information system is a set of interdependent components that support decision making and control in organizations by collecting, processing, storing and distributing data [2]. Information systems carry out three major activities: data input, processing and data output. In other words, the data is entered into the information system, on which data processing operations are performed to transform it into information with specific formats and ultimately this information is provided to its users to use it [9].

The information system collects, processes, stores, analyzes and disseminates information for a particular purpose. This system processes inputs using technologies such as computers, such as computer, and sends outlets to users or other systems via electronic networks [10].

The four main applications of information systems are: financial and accounting management, material and inventory control, receipt and fulfillment of orders, sales force automation [11]. In the following parts, the most common types of information systems will be introduced.

Transaction Process Systems:

Transaction process system (TPS) is usually run directly by workshop workers or employees who provide the key data needed to support operation's management. This information is usually obtained through automated or semi-automated tracking of low-level activities and transactions. In terms of diversity, these types of systems are most diverse [12].

Incident processing systems are commonly used by organizations to do simple and repetitive tasks and activities that are done on a daily basis. Working with these systems is simple and routine, and these systems mostly record transactions that support the organization's communication with the outside of the organization [13].

Payroll systems, order processing systems, reservation systems, stock control systems, payment and transfer systems, are some of the transaction processing systems [14].

Decision Support Systems (DSS):

These systems are used to implement complex statistical and mathematical models, data analysis and support of ap-

plied decision. The inputs of these systems are low data volume, processing along with interaction with user, output from the decision analysis, and its users are the professional personnel of the organization. Decision support systems are used to decide where there is no history, and the results obtained help managers in making unique decisions that are unstructured or semi-structured. These systems, in practice, combine the intelligence of managers or professional staff with computer capabilities to improve the quality of decisions [15].

Group decision support systems (GDSS), computer support of collective work (CSCW), transportation systems, and financial planning systems are some of the examples of decision support systems [2].

Executive Information Systems (EISs)

Since the senior manager through using the minimum number of facilities and information, must have the most complete and comprehensive understanding of the organization conditions and on the other hand, he should have criteria for evaluation, and the rooting of issues may be significant for the him, this system can provide senior managers with the best help. Executable information systems organize and provide data and information from external and internal data sources or information management systems and transaction processing systems to support and develop the intrinsic capabilities of senior executives [16].

Information Management Systems:

The information systems of management perform the task of supporting middle management and operational management with the information they provide and consequently lead to a better performance by the manager. The attention of information management systems is to the past and present, and specifically focuses on the internal operations of the organization and does not communicate with the outside of organization and also summarizes the vast operation of the organization. These systems are structured and semi-structured. Nevertheless, information management systems do not have high flexibility and cannot handle extensive and complex processing. The models used in information management systems are simple ones and are used for reporting. Sales management systems, inventory control systems, budgeting systems, management reporting systems, and human resource management are some of the information management systems. These systems have tasks such as supporting relatively structured and rigid decision-making and quantitative analytical capacities used by low and medium management levels [17].

The degree to which a particular system operates efficiently depends on a set of factors such as the type of applications, equipment, the technical competence of the human resource, the support of the superior manager of the organization, and its predictive applications.

Altogether, the following are accepted by most users [2]:

- Provide decision-makers timely with precise information;
- Respond to management inquiries to access information;
- Offering report on the basis of the exception;
- System be capable of Future integration;
- System is accepted by users;

Mentioning this point may be unnecessary: if all the previous conditions are provided, but for whatever reason the

system is not accepted by the users, it will not succeed. It happens very much that despite proving the fact that the system is useful for managers but because of the refusal of the staff, the system remains without use. In some cases, sabotage was observed by the staff [2].

Information systems are designed with special purpose; the purpose of each system is to coordinate management efforts in order to achieve organizational goals.

Designing information management system has the following results:

- Reducing uncertainty to improve decision quality.
- Increasing the productivity of individuals and capital and reducing costs.
- Optimizing communications and reports
- Improvement in the quality and quantity of information
- Quick access to relevant and timely information
- Quick correction of out of control conditions (management based on exception)
- Focusing on general goals and objectives [18].

Review of Literature

Lu et al (2006) in a study on Cisco and Zhao Tang Chin's interagency information systems, examined the main drives of the success of the intra-organization information systems and identified seven key factors that are: strong motivation, shared vision, Inter-organizational executive team, high integration with internal information systems, reengineering of intra-organization business processes, information systems, the developed infrastructure that remained from past and joint industry standard. Rezaei et al. (2009), using perceptual indicators, investigated the effect of organizational factors on the success of information systems. They obtained their data using a questionnaire which they distributed among 132 managers in the agricultural development sector. The seven organizational factors in this paper were the structure of the information system, senior management support, management style, management information technology knowledge, target alignment, resource allocation, and information system infrastructure. In this study, they concluded that organizational factors were significantly related to the success of the information system.

Al-adaileh's study (2009) also highlights the quality of information as one of the success factors of the information system in the organization. In the study of Hussein et al. (2007), goal alignment is also considered as an important indicator of the success of the information system. Al-adaileh (2009), Chen et al. (2012), Hussein et al. (2007) also referred to senior management support as an important indicator in the success of information systems. In the research of Al-adaileh (2009), the quality of information is mentioned as an important factor in the success of the information system. The results of research by Melas et al. (2011) show that the level of familiarity with information and communication technology can affect the variables of system acceptance [4].

Al-adaileh's study (2009) also identifies technical capabilities of user as one of the success factors of the information system in the organization. In a study by Hussein et al. (2007), the knowledge of management information technology is considered as an important indicator of the success of the information system.

In the research by Nematbakhsh et al. (2001), the Goodhue's model was used for investigating the success of infor-

mation systems. Among 22 large organizations in Isfahan, which have more than 1,000 employees, seven industrial and service organizations including Mobarakeh Steel Complex, Polyacrylate Iran, Sepahan Cement, District Electricity, Isfahan Power Station, Isfahan University and Al-Zahra Hospital were selected and the total of 110 questionnaires were distributed among the users of information management systems i.e. managers and employees. Among seventy collected questionnaires, 62 of them were completely used.

Descriptive and inferential statistical methods have been used to analyze the hypotheses of research. The results indicate that in the service and industrial organizations of Isfahan province, the management information systems have been almost successful. The purpose of the study by Lagzian et al., is to evaluate the success rate of the financial information system of Ferdowsi University of Mashhad based on the modified model of success rate, that was presented by Delon and McLean. This process is done through conducting survey of information systems in the financial sector of the university with focus on individual applications of information systems from the perspective of intra-organizational users. The findings of the research indicate that the quality of the financial information system of the university is a good predictor for users' application and their satisfaction with the system. Also, the quality of the information system has a positive relationship with individual influences. The quality of the information of the mentioned system also is directly related to the users' satisfaction of this system, but there is no relationship between the quality of information and the user's application. In the study by Arefnejad et al. (2012) through reviewing these factors, the effect of organizational factors and organizational learning on the success of information systems, using structural equations approach, has been investigated. The statistical population of this research is the Industry, Mines and Business Organization of Isfahan. After collecting information by questionnaire, we analyzed the collected data. The results show the positive effect of organizational factors and organizational learning on the success of information systems in the industry, Mines and Business Organization of Isfahan. The study by Jabraeli et al. (2014) was conducted to identify the effective factors on the success of the implementation of hospital information systems. This study was performed on 160 hospital information system users in educational centers of Urmia University of Medical Sciences. The participants were selected by multi-stage cluster sampling. The results showed that the highest average of obtained score in the four factors of success of the implementation of hospital information systems is related to project management and the lowest average of obtained score is related to organizational factors. According to the findings, they suggested that the success of the implementation of the hospital information system requires attention to the factors associated with project management. Therefore, the outlook (road map) for the implementation of the system should be carefully drawn up and a working group with the participation of users and appropriate leadership should be formed.

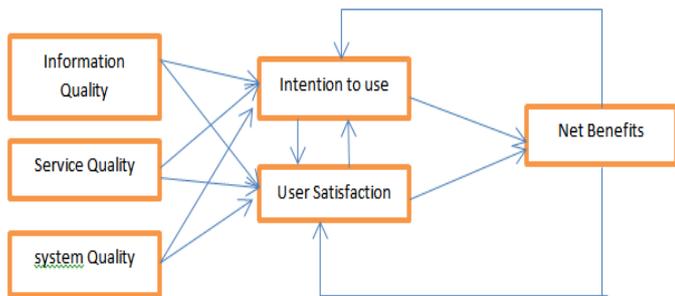
Theoretical Framework of Research

Several studies have been conducted to investigate the factors affecting the success of information systems. One of the most important of these study, is the study of Delone and

McLean. For organizing multiple researches and providing a more comprehensive view of the concept of the success of information systems, the two researchers presented a comprehensive classification. This categorization involves six dimensions in the success of the information system. These six dimensions include system quality, quality of information, service quality, rate of use, user's acceptance (satisfaction), benefits [19].

0.82	service quality		
3	tendency to use		
0.79	r's use		
5	satisfaction		
0.73	benefits		
9			
0.75			

Figure 1. shows the Delon and McLean model:



Research Methodology

The present research in terms of purpose is a functional research and in terms of data collection is descriptive-survey. The statistical population of this research is composed of all clerks and more senior employees of the Lavan Oil Refining Company, whose number is 134. The sample size which was calculated using the Cochran formula is 100 subjects:

$$n = \frac{Nt^2 pq}{Nd^2 + t^2 pq} = \frac{134 \times (1.96)^2 \times 0.5 \times 0.5}{133 \times (0.05)^2 + 1.96^2 \times 0.5 \times 0.5} = 100$$

The subjects were selected by simple random sampling and participated in the research. Furthermore, Delone and McLane's standard questionnaires were used to collect the required field information. In this study, content validity techniques were used to confirm the questions of questionnaire. According to the experts' opinions, the necessary changes were made in the questionnaire and then distributed among the subjects of the study. In order to evaluate the internal consistency of the questionnaires, the Cronbach's alpha coefficient separately (based on the results of 30 questionnaires distributed among the subjects) for each of the factors was calculated. The results are presented in Table 1. The values of the Cronbach's alpha coefficient calculated for the different sections of the questionnaire indicate that this tool has the necessary reliability capacity:

Table 1. Level of Cronbach's Alpha indices and research constructs.

Alpha Value	Index	Value	Construct
0.82	system quality	0.875	Information system
0.809	informati on quality		

Data Analysis

In this research, Shapiro and Wilek's test was used to assess the normal distribution of data of research variables. The result is shown in Table 2

Table 2. Shapiro and Wilek's test

Significance Level	Shapiro and Wilek	Research Variables
0/340	0/917	System quali-
0/091	0/867	Information
0.175	0/910	Service quali-
0/104	0/893	Tendency to
0/142	0/901	User' satis-
0/388	0/933	benefits

The results obtained from this test confirm the normal distribution of the data of the research variables. Regarding the non-normality of the distribution of information system indicators, a two-sentenced test is used to test the research hypotheses.

The null hypothesis and hypothesis one are defined as follows:

Null hypothesis: P₁=P₂

Hypothesis one: P₁ ≠ P₂

P₁ and p₂ also are defined as follows:

Table 3. Definitions P1 and P2

4.5 in Likert scale (more than average)	First percentage group	P ₁
3, 2, 1 in the Likert scale (equal to and less than average level)	Second percentage group	P ₂

Also, the test ratio is considered to be 0/50. The output of

Con- firm- ing Hy- pothe-	Sig- nifi- canc e Lev-	Ratio of the Test	Ob- serve d Ratio	Fre- quenc y	Cat- ego- ry	Grou p	Index
<input checked="" type="checkbox"/>	0.19 3	0.50	0.52	52	> 3	gr oup1	syste m quality
			0.48	48	= <3	gr oup2	
<input checked="" type="checkbox"/>	0.00 0	0.50	0.79	79	> 3	gr oup1	infor mation quality
			0.21	21	= <3	gr oup2	
<input checked="" type="checkbox"/>	0.00 0	0.50	0.70	70	> 3	gr oup1	servi ce quality
			0.30	30	= <3	gr oup2	
<input checked="" type="checkbox"/>	0.23 5	0.50	0.51	54	> 3	gr oup1	tend ency to use (user's ac- ceptanc
			0.49	46	= <3	gr oup2	
<input checked="" type="checkbox"/>	0.03 5	0.50	0.69	69	> 3	gr oup1	Us- er's satis- faction
			0.31	31	= 3	gr oup2	
<input checked="" type="checkbox"/>	0.00 0	0.50	0.74	74	> 3	gr oup1	ben- efits
			0.26	26	= 3	gr oup2	

the two-sentenced distribution test is shown in Table 4:

Table 4: The output of the two-sentenced test

Based on results of Table 4, we have:

System Quality: Out of 100 sample size, 48 responded equal to or less than average, accounting for about 48% of the sample size, and 52 of them responded more than average, accounting for about 52% of the sample size. Given that the significance level is greater than 0/05, it can be concluded that the h_1 is rejected. Therefore, considering the observed ratios with 95% confidence level, we can say that the quality of the information system of the organization is not in the desired level (in fact, there is no statistically significant difference between the ratio of medium and low responses, and high and very high response ratio).

Information Quality: Out of 100 sample size, 21 responses were equal to or less than average, accounting for 21% of the sample size, and 79 of them responded more than the average, accounting for about 79% of the sample size. Given that the significance level is less than 0.05, it can be concluded that the h_1 is confirmed. Therefore, considering the observed ratios, it can be said with 95% of confidence level, that the quality of information is in a desirable level (in fact, there is a statistically significant difference between the ratio of medium and low responses, with high and very high response ratios. Also the ratio of high and very high responses is significantly higher than the ratio of average and lower than average responses).

Service Quality: Out of 100 sample size, 30 of them responded, equal to or less than average, which is about 30% of the sample size, and 70 of them responded more than average, accounting for about 70% of the sample size. Given that the significance level is less than 0.05, it can be concluded that the h_1 is confirmed. Therefore, considering the observed ratios with a 95% confidence level, we can say that service quality is at a desirable level (in fact, there is a statistically significant difference between the ratio of medium and low responses, with a high and very high response ratio, and the ratio of high and very high responses is significantly higher than the ratio of average and lower responses).

Level of User's Acceptance: Out of 100 sample size, 46 of responses were equal to or less than average, accounting for 46% of the sample size, and 54 of responses were more than the average, accounting for about 54% of the sample size. Given that the significance level is greater than 0.05, it can be concluded that the h_1 is rejected. Therefore, considering the observed ratios, with a 95% confidence level, it can be said that the user's acceptance is not at the optimal level (in fact, there is a statistically significant difference between the ratio of medium and low responses, and high and very high responses ratio).

User's Satisfaction: Out of 100 sample size, 31 of responses were equal to or less than average, accounting for 31% of the sample size, and 69 of responses were more than average, accounting for about 69% of the sample size. Given that the significance level is less than 0.05, it can be concluded that the h_1 is confirmed. Therefore, considering the observed ratios, with 95% confidence level we can say that user's satisfaction is at a desirable level (in fact, there is a statistically significant difference between the ratio of average and low responses, and high and very high response rate, and the ratio of high and very high responses is significantly higher than the ratio of average and lower responses).

Benefits: Out of 100 sample size, 26 of them responded, equal to or less than average, accounting for 26% of the sample size, and 74 of them responded more than the average, accounting for about 74% of the sample size. Given that the significance level is less than 0.05, it can be concluded that the h_1 is confirmed. Therefore, considering the observed ratios with 95% confidence level, the system benefits are in a desirable level (in fact, there is a statistically significant difference between the ratio of medium and low responses, and high and very high response rate. Also the ratio of high and very high responses is significantly higher than the ratio of average and lower responses).

Conclusion

The results of data analysis showed that the quality level of the information system and the acceptance of users are not at the desired level. Since the environment of organizations, processes and agents within the organizations is constantly changing and this leads to changes in the information needs of managers. Therefore, the design and optimization of an appropriate information system in the organization should be considered as a continuous process. Therefore, designers should predict the necessary adaptive capacity and suitable in their system. In order to improve the quality of the given system; timely availability of information, the little amount of time required to responsiveness of information system to user's demands, the completeness and integrity of information in the information system should be considered. One of the effective factors on the successful management information system is the acceptance of information systems by users. Training is one of the most important factors in the acceptance of information systems. One of the current problems in using and accepting the information systems is the demands of senior managers and IT departments from employees to use certain software, notwithstanding no training has been done. Therefore, it has been proven that sometimes, due to lack of proper training for users, the implementation of information systems fails. Accordingly, the company should take steps to educate staff and users such as the following cases: Providing internal and external training for users, educational planning of staff in public and specialized groups for the use of employee. Companies need to increase their staff training to improve their skills and knowledge. The reason for the failure of many IT projects and rejecting their information systems is the lack of training of end users (Ajami et al., 2012). Senior management should provide the necessary funds for conducting training programs and improving their employees' skills. Additionally, senior managers and executives need to prepare the necessary facilities for conducting educational programs, encouraging and incentive programs and necessary support of employees in order to increase the use of information systems.

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