



## Studying the application of management information system (MIS) in human resource system's performance

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### **Abstract:**

Human resource management practices are changed with the emergence of information technology and thus the application of management information systems. This can be effective if first we know the activities which can be done by the management information systems, and then try to provide the background for these activities. Subsequently, the human resources management will be familiar with the new requirements in order to be able to improve the human resource performance in the organization through the capacities which these information systems can make. Management information systems and human resources performance are presented in this paper and then the relationship between these two factors is evaluated and importance of management information systems role have been considered as well as their applications for better human resource management performance. This research, which is conducted in this regard, is descriptive and correlative. The obtained results are from library and field studies and the statistical population is composed of human resources department staffs in Khuzestan Steel Company.

**Keywords:** Management Information Systems - Human Resource Management - Human Resource Management Performance

## Introduction

During the past two decades, industrialized societies are encountered with a new revolution called "information revolution" and the world is entered a new era called the "information era"; moreover, the society is also referred as the "intelligence community". In this regard, the management information system (MIS) is one of the latest technologies by which you can provide the necessary timely and detailed information about the management in order to facilitate the decision-making process and help the individuals to plan, control and implement the tasks successfully. Human resource information in any organization is among the information which not only is essential for HR managers, but also for other managers including the senior managers in the organization. According to the published books in the field of human resource management (for example, the book "The Human Resources Management" by Neo in 2007 and another book with the same name written in 2009 by Robbins ...), the human resources include the basic elements including the human resource planning, employment, training and development of human resources, employees' performance evaluation, compensation of personnel services, and the organization personnel resignation and relocation. In general, it is referred to the human resource management performance. These measures (human resource management performance) are not possible without the access to the detailed information about the human resource which is applied in the organization. Therefore, we are seeking in this paper to evaluate the relationship between the application of management information systems (as independent variable) and employees' performance of human resources systems in Khuzestan Steel Company (as dependent variable). Thus, the basic hypothesis is as follows: "There is a significant relationship between the application of management information systems (MIS) and the human resource system performance".

According to the research subject, it seems that only the desired variables have been separately investigated since the relationship between these variables has not received much attention in the higher education sector. Some of the foreign articles are observed in this regard. For instance, in a thesis by Alireza Modarres-Zadeh (2004) entitled as "Investigating the effect of human resource management information systems on the managers' performance in Kashan Water and Wastewater Company", which is done to obtain a master's degree from the University of Kashan, the relationship between the information systems and managers' performance is studied and it is indicated that there is a significant relationship between the information systems and the managers' performance. Furthermore, Chi Sin Lee and Chi Hoon Lee (2010) investigated the effect of IT capabilities on the relationship between the human resource management and the application of information technology in an article entitled as "The effect of Information Technology on the Human Resource Management" conducted in Nanyang Technological University in Singapore, and concluded that the human resource management will be well implemented, jobs will be clearly defined, and the application of IT will be well taught in the organizations that make use of the internal IT resources. Despite the importance of management information systems (MIS), unfortunately, the importance of information, which is the basis of planning and other human resource management functions, has been taken less into account in most of our organizations. Moreover, the information in the field of human resource management in the organizations and agencies is not mostly accurate, updated, complete, and applicable and most of the provided statistics are almost correct. According such a situation in the institutions and organizations and increasing emphasis on the importance of information management in today world on the one hand, and on the other hand, an extremely proper and updated management information system (MIS) in Khuzestan Steel Company, the researcher in this article is attracted to the subject and thus he has re-examined the relationship between the management information systems (MIS) and the human resource system performance. It is hoped that the other organizations, which have not conducted still the appropriate management information system, make an appropriate decision to apply these systems by observing the success of organizations which have paid attention to the management information systems. The purpose of this paper is Evaluating the application of management information system (MIS) in employees' human resource system performance.

## Generalities

### Management Information Systems (MIS)

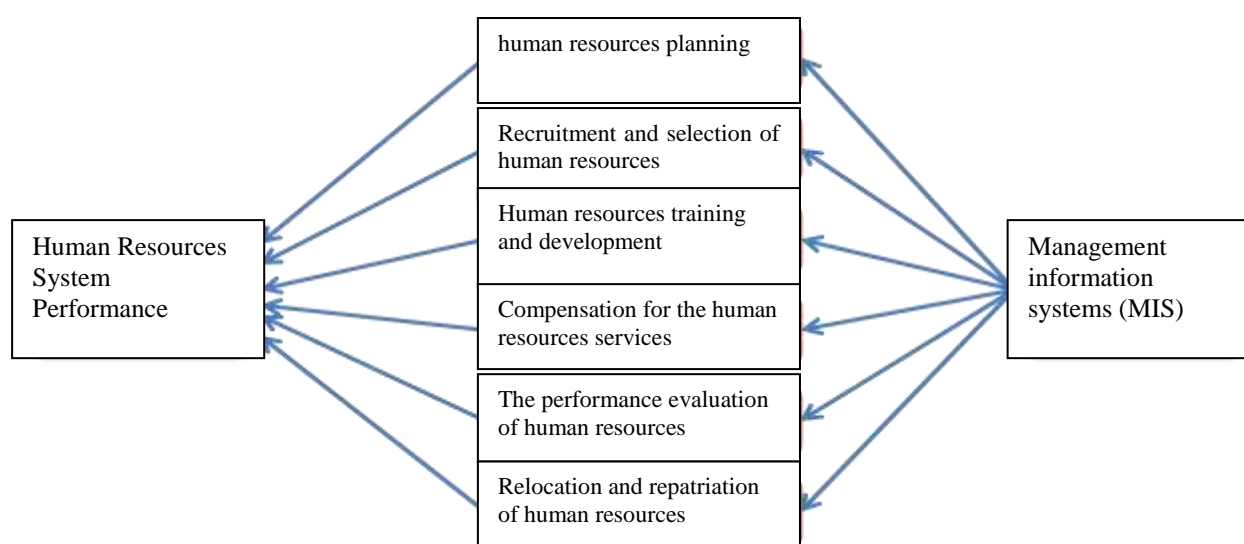
They are information systems which provide required information for the managers. In this study, the managers' decisions support the information systems.

### Human Resource Management

Human Resource Management (HRM) includes the activities which are designed and developed in order to work for an organization's human resources. Human resource in an organization is one of its most valuable assets. In fact, the government reports have indicated that 72% of the national income is as the result of employing the staff. In addition, regarding the salary and payments, the organizations invest in their human resources. Employment, hire and training are some of the obvious instances of these investments (Byars & Rue, 2000) considered all staff aspects including the salary, insurance and retirement, attendance and....

### Human Resource management Performance

Each of different departments of management may have different issues to be considered as the human resource management functions; however, some of its most common types include: The human resource planning, employment and selection processes, socializing the human resources, human resources training, performance evaluation, and discipline and salary. Based on some available books in the field of human resources especially the book by Noe & Hollenbeck, Wright (2007) and the book by DeCenzo & Robbins (2009), the basic functions of human resource management have been identified as follows: Human resource planning, employment, human resources selection, human resources training, human resources performance evaluation, and human resources mobility and exclusion. Management information system (MIS), as the independent variable, affects the human resource planning, employment, human resources selection, human resources training, human resources performance evaluation, and human resources mobility and exclusion. These six factors are the features of the human resource system performance. Therefore, the human resource system performance is affected by the application of the management information systems in the organizations. The relationship between the management information systems and the elements of human resource system can be observed in the Figure (1):



**Fig.1 The conceptual model of data based on the relationship between management information systems and the performance of human resources system<sup>1</sup>**

<sup>1</sup> Fundamentals of Human Resource Management, NewYork: MacGraw-Hill, 3th edition

### Human Resource Information System

Human Resource Information System (HRIS) is a database system which includes all the communications and the information-related human resources and provides the facilities for maintenance and access to the data (Byars & Rue, 2000). Practically, the HRIS refers to every information systems (MIS, DSS,...), every IDE and retrieved information (such as Excel and Access) and every database (computer and paper). Major information systems: The transaction process systems (TPS), knowledge work systems and office automation systems (KWS, OAS), decision support systems and management information systems (MIS, DSS), executive supports senior (ESS). The following Figure (2) shows the relationship between different information systems:

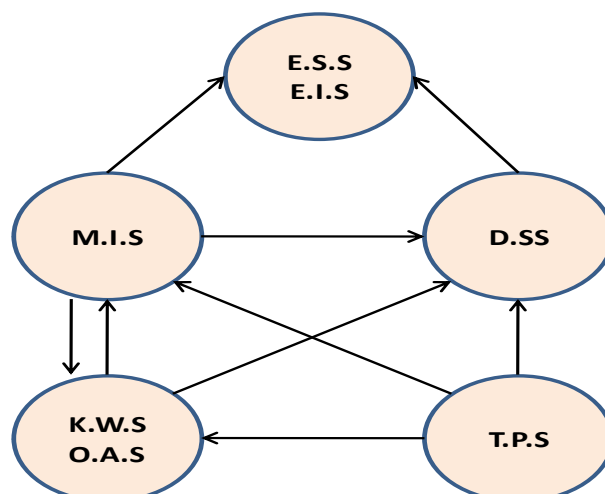


Fig.2 The relationship between the information systems (Lauden & Laudén, 2008)

### Manpower Planning

Since the human resource is now the most important asset of any organization and the main source of production and the main source of providing the competitive management which creates the essential capabilities for any organization, the human resource planning is one of the most important organizational planning (Talebian, 2007).

Wayne (2008) defined the Human Resource Planning as in his paper entitled as "The Human Resource Planning": It is a systematic process for allocating the potential internal and external forces to the jobs (Wayne, 2008)<sup>2</sup>.

### Selection Process

After informing the candidates about ending the employment process, we should start the selection process of employment. The process of selecting the most suitable person for the career position is known as the selection (Seyed Javadein, 2008).

### Employment and power supply

While facing with the lack of power in an organization, we should consider the measures for employing the manpower. This should be along with other human resource management processes and functions of human resource planning; moreover, you should consider the rules, punishment and encouragement policies, the processes for creating the motivation, and development and survival of organization (Mondy & Noe, 1987). Employment is the process by which those, who seem to have the potential ability to perform the duties and registered in the organization, are identified and attracted to the organization (Saadat, 2008).

### Socialization process

<sup>2</sup> Wayne, M. (2008). Human Resource Planning

According to a definition, socializing an individual is the process by which the individual obtains the adequate information about the organization associated with the business and makes himself compatible with the situation, learns what to do and what is expected by accepting the values, norms and behavioral models. (Berlew & Hall, 1966) If successful, his socialization makes him continue to stay and leads to a greater commitment to the organization and his duties and functions, but in case of failure, the result will usually lead to the failure in the business and left work.

### **Staff training process**

During the past, it was seemed that the learning, working and living time are separate; thus, the type of training which is provided for the individuals before starting the job is noteworthy. Therefore, the individual is taught for a period of time, and then lives and works productively and profitably, but there is no considerable chance for education when the job is started. These ideas are not reliable now and the education is dependent on the human existence. All people should be learning all the time and enjoy the new findings and knowledge and continue their lives with more knowledge power (Shariatmadari, 2008)<sup>3</sup>.

Training is an experience based on learning and is the process of making the relatively permanent changes in an individual, thus he will be able to do some of the tasks and improve his abilities, change the skills, knowledge, attitudes and social behavior. Therefore, training means to change the knowledge and attitude as well as the interaction with the coworkers (Michalak & Yager, 1977).

### **Payment system (reward systems, payment management)**

An organizational reward system includes the paid reward. Organizational rewards can include any kind of reward, both internal and external, which is granted to the employees as the result of their works. The intrinsic rewards are often the good feelings which the people will have because of doing the accurate organizational activities (Byars & Rue, 2000).

According to the advantage of intrinsic rewards, the individual intrinsic motivation and active movement will be maintained in his existence and thus, the need for a boss to make a movement will be minimized (Saadat, 2008).

External rewards are directly controlled by the organization and they are palpable. Salary and medical advantages are the examples of extrinsic rewards (Saadat, 2008).

### **Staff performance evaluation**

Performance evaluation is the process of estimating the way an employee does his job and provides the plans for its improvement (Byars & Rue, 2000).

Executive decision making for the promotion, dismissals, and termination of service are among the most common advantages of performance evaluation; moreover, the salary is increased based on the merit. Performance evaluation also provides the required inputs in order to estimate the individual and organizational training and development requirements. The performance improvement is another important advantage of the performance evaluation. In this regard, the performance evaluation will investigate the employees under these headings: How well are their functions and what are the recommendations about the changes in the staff behavior, attitudes, skills and knowledge. Finally, two other important advantages of information generation by the evaluation include: (1) Being involved in the validation of selected procedures, (2) Being involved in the human resources programs (Byars & Rue, 2000).

### **Dismissal of employees from the organization**

Given that the first duty of human resources and employee management is to employ the staff from the society to engage in the organization, it is logical that its last task will be to restore the employee to the society.

We will examine the following three methods of dismissal:

- 1- Retirement of older employees;
- 2- Laying off or dismissing the qualified young employees to whom the organization does not need;

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<sup>3</sup> Shariatmadari, M., (2008). Staff Training Process

3- Dismissing the employees who have not met the expectations of organization.

All of mentioned cases are important and sometimes they are unpleasant events for the employees and the organization management (Flippo, 1994).

### Human Resource Information System (HRIS)

The increased human resource needs, government regulations and the development of microcomputer facilities are all the information evolved in the human resource information system. The human resource information system (HRIS) is known on this basis. HRIS is a database system which includes the communication and information-related human resources and provides some of the facilities to maintain and access these data (Byars & Rue, 2000).

Furthermore, the HRIS has three functions: 1) input, 2) maintenance and studied data, and 3) output. The role of each of these functions in the system is described as follows:

- **Input function (task):** The input function provides the required capabilities for the human resources data in the HRIS. Once the data is entered, it should be validated in order to confirm the accuracy. (Byars & Rue, 2000)

- **Maintenance and review of data function (task):** Maintaining and reviewing the data function is a response to the actual revisions on the data stored in different storage devices. When a change is occurred in the human resources (such as annual salary increases) this information should be entered into the system. (Byars & Rue, 2000)

- **Output function:** The output function of a HRIS is its most common and visible part because most of the HRIS users, who are not involved in the integration, modification, validation and update of human resources data, are associated with the system information and reports (Byars & Rue, 2000).

### Materials and Methods

To investigate the relationship between the management information systems (MIS) and recruitment and the selection of human resources in 1389, 134 employees of the Human Resources Deputy of Khuzestan Steel Company were considered as the statistical population of the study and 100 employees were selected as the sample using the Morgan table.

The total number of employees working in Khuzestan Steel Company is 5,690 people among whom 134 employees are working with computerized management information systems in the Human Resources Deputy and take advantage of the extracted information to manage the human resources and also form the statistical population of the present study. They were selected using stratified sampling method. To determine 134 subjects from different occupational categories (Manager, director, supervisor, master or senior expert, expert, master technician and senior staff), systematic sampling method and the official list of employees which is stored in the order of the organizational identification number were used and the people were selected and the research questionnaires were delivered to them. See table 1.

**Table.1 The table of setting the samples required for each job category**

Job Category	Nk (Number of people in each population)	nk = pk × n (Number of samples in each population)	$pk = \frac{Nk}{N}$ (Proportion of people in each population)
manager	6	4	%4
Director or boss	16	12	%12
supervisor	5	4	%4
Master or senior expert	21	16	%16
expert	36	27	%27
Senior Technician / Senior Staff	50	37	%37
total	134	100	%100

For this purpose, an original hypothesis and six sub-hypotheses were formulated. The relationship between the management information systems as independent variable and the performance of human resources system as the dependent variable formed the hypotheses. To test the hypotheses, a questionnaire was designed. This researcher made questionnaire consisted of 36 general questions and

30 specialized questions to assess the relationship between independent and dependent variables. To determine the validity of the questionnaire, the initial design of the questionnaire was examined by the specialists and professors and its validity was confirmed. Using the SPSS software, the Cronbach's alpha coefficient of the questionnaires was calculated and its value was obtained equal to 0.93 which confirmed the reliability. A total of 110 questionnaires were distributed and 85 questionnaires were collected and analyzed. In addition, the equation used to calculate the reliability coefficients through the Cronbach's alpha was as follows:

$$\alpha = \frac{n}{n-1} \left(1 - \frac{\sum S^2_i}{S^2_t}\right) \tag{1}$$

n= the number of questions

$S^2_i$ = the variance of questions

$S^2_t$ = the total variance of the questionnaire

In order to analyze the collected data, the chi-square test and Friedman ranking test were used with the following statistics:

$$\chi^2 = \frac{s^2(n-1)}{\delta^2} \text{ The chi-square statistic} \tag{2}$$

n = the number of samples

$s^2$ = Variance in sample

$$\chi^2 = \frac{12}{kn(k+1)} \sum_{j=1}^k R_j^2 - 3n(k+1) \text{ Friedman test statistic} \tag{3}$$

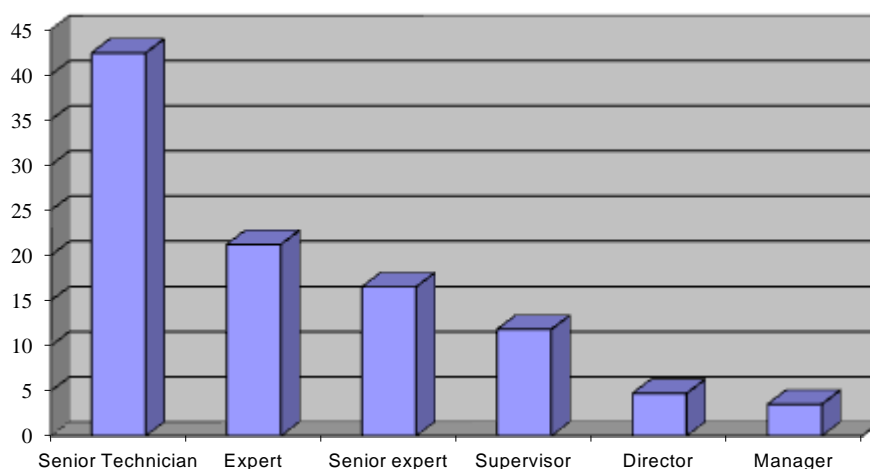
k = number

n = the number of blocks

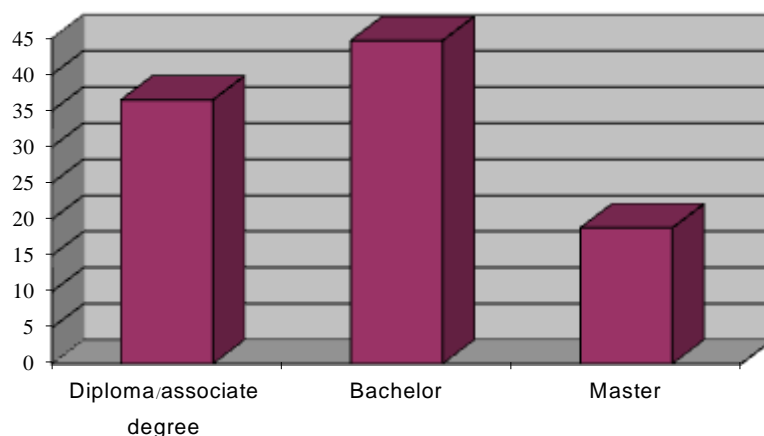
$R_j$ = the total ranking of j-th column (treatment)

$\chi^2$ = The test statistic. Almost with the distribution of  $\chi^2$  with (k-1) degrees of freedom

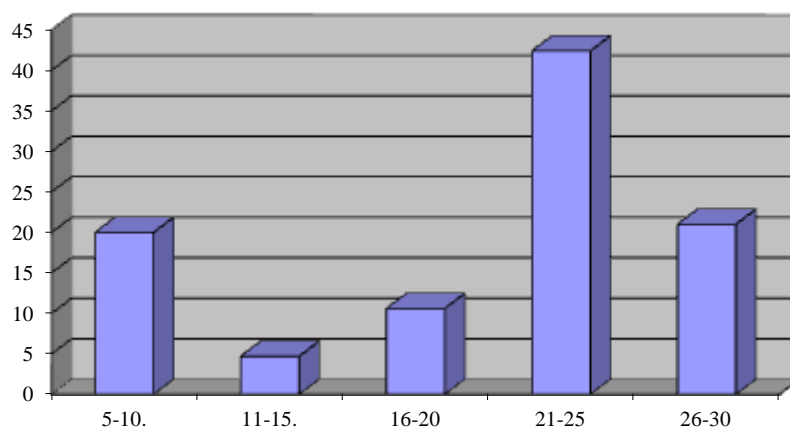
Here is a summary of the statistical results in figures 3, 4, 5 and 6:



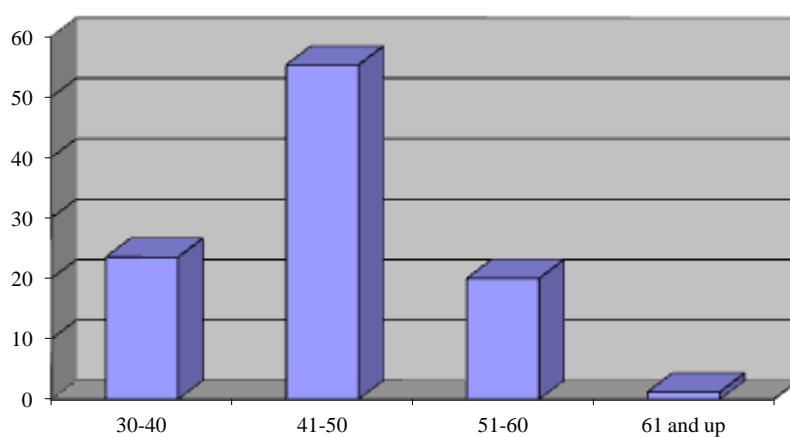
**Fig.3 Frequency percentage of the respondents' occupational levels**



**Fig.4 Frequency percentage by the level of education**



**Fig.5 Frequency percentage by the work experience**



**Fig.6 Frequency percentage by the respondents' age**

Based on the above figures, the largest number of respondents had the senior occupational rank , the education degree of bachelor , 21-25 years of work experience and were at the age range of 41 to 50 years.



The chi-square test and Friedman rank test are used in order to analyze the collected data. A summary of statistical results is presented as follows.

**Chi-square table for the entire research hypotheses**

The relationship between the management information system and different performance factors is considered in this research. In general, the data is presented in table (1):

**Table 2. Chi-square table for the entire research hypotheses**

variable	Chi-square statistic ( $\chi^2$ )	Degrees of freedom (df)	Significance level
Human resource planning systems	14.47	4	0.000
Attraction, selection and employment Process	29.88	4	0.000
Training and human resource development Process	64.94	4	0.000
Human resource compensation process	52.118	4	0.000
Staff evaluation process	88.35	4	0.000
Employees' service dismissal and relocation process	53.88	4	0.000
Human resource management performance	56.941	4	0.000

The hypotheses are as follows:

**- Human resource planning:**

- $H_0$  : There is no significant relationship between the application of management information systems (MIS) and the human resource planning system.
- $H_1$  : There is a significant relationship between the application of management information systems (MIS) and the human resource planning system.

With the error 0.05 and confidence level 0.95, the calculated chi-square is higher than the chi-square table and the significant level is less than 0.05. Thus, our hypothesis ( $H_1$ ) will be accepted. With the confidence 0.95, it can be concluded that there is a significant relationship between the application of management information system (MIS) and the human resource planning system.

**- Attraction, selection and employment:**

- $H_0$  : There is no significant relationship between the application of management information system (MIS) and attraction, selection and employment.
- $H_1$  : There is a significant relationship between the application of management information systems (MIS) and attraction, selection and employment.

With the error 0.05 and confidence level 0.95, the calculated chi-square is higher than the chi-square table and the significant level is less than 0.05. Thus our hypothesis ( $H_1$ ) will be accepted. With the confidence 0.95, it can be concluded that there is a significant relationship between the application of management information system (MIS) and the process of attraction, selection and employment.

**-Human resource compensation process:**

- $H_0$ : There is no significant relationship between the human resource compensation process and the application of management information system (MIS).  
 $H_1$ : There is a significant relationship between the human resource compensation process and the application of management information system (MIS).

With the error 0.05 and confidence level 0.95, the calculated chi-square is higher than chi-square table and the significant level is less than 0.05. Thus our hypothesis ( $H_1$ ) will be accepted. With the confidence 0.95, it can be concluded that there is a significant relationship between the application of management information system (MIS) and the human resource compensation process.

**-Staff evaluation process:**

- $H_0$ : There is no significant relationship between the application of management information system (MIS) and the staff evaluation process.  
 $H_1$ : There is a significant relationship between the application of management information system (MIS) and the staff evaluation process.

With the error 0.05 and confidence level 0.95, the calculated chi-square is higher than chi-square table and the significant level is less than 0.05. Thus, our hypothesis ( $H_1$ ) will be accepted. With the confidence 0.95, it can be concluded that there is a significant relationship between the application of management information system (MIS) and the staff evaluation process.

**-Employees' service dismissal and relocation process:**

- $H_0$ : There is no significant relationship between the application of management information system (MIS) and the employees' service dismissal and relocation process.  
 $H_1$ : There is a significant relationship between the application of management information system (MIS) and the employees' service dismissal and relocation process.

With the error 0.05 and confidence level 0.95, the calculated chi-square is higher than the chi-square table and the significant level is less than 0.05. Thus, our hypothesis ( $H_1$ ) will be accepted. With the confidence 0.95, it can be concluded that there is a significant relationship between application of management information system (MIS) and the employees' service dismissal and relocation process.

**- Human resource management performance:**

- $H_0$ : There is no significant relationship between the application of management information system (MIS) and the human resource management performance.  
 $H_1$ : There is a significant relationship between the application of management information system (MIS) and human resource management performance.

In general, according to the above table and the relationship between the application of management information system and the human resource management performance, it can be seen that with the error equal to 0.05 and the confidence level 0.95, the calculated chi-square in all tests is higher than the chi-square table and the significant level is less than 0.05. Thus, our hypothesis ( $H_1$ ) will be accepted. With the confidence 0.95, it can be concluded that there is a significant relationship between the application of management information system (MIS) and the human resource management performance.

### Friedman rank test for investigating the research hypotheses

Friedman's rank test is used in order to assess the respondents' opinions about the impressive factors of the application of management information system (MIS) and comparison of these opinions. The objective of this test is to rank the factors by using the respondents' opinions which are provided in the test results.

### Comparing the impressive factors of the application of management information system (MIS):

- $H_0$  : There is no significant relationship between the mean score of multiple impressive factors for application of management information system (MIS).  
 $H_1$  : There is no significant relationship between the mean score of multiple impressive factors for application of management information system (MIS).

Comparison of the impressive factors for application of management information system is shown in Table (2) :

**Table 3. Comparison of the impressive factors for application of management information system (MIS)**

factors	Mean scores
Human resource compensation process	4.21
Attraction, selection and employment Process	4.08
Employees' service dismissal and relocation process	3.64
Staff evaluation process	3.41
Training and human resource development Process	3.40
Human resource planning system	2.26

Given the obtained mean scores for different dependent variables (human resource planning system, Attraction, selection and employment Process, and Employees' service dismissal and relocation process), it is concluded that the variable of human resource planning process has the minimum effectiveness and human resource compensation process has the maximum effectiveness of the management information system (MIS) (independent variable). Calculated chi-square statistics for Friedman hypothesis test is shown Table (3) :

**Table 4. Calculated chi-square statistics for Friedman hypothesis test**

Calculated $\chi^2$	Significance level	Allowable error rate	Test result
$H_0$	0.05	0.000	74.34

According to the above table, since the significance level is less than 0.05,  $H_1$  is accepted. There are significant differences between the mean scores of multiple impressive factors for application of management information systems (MIS). As seen in the respondents' opinion, the human resource compensation process is the most effective process and the human resource planning system has the least effectiveness for the application of management information system (MIS).

### Conclusion

At the beginning of this research, this question was raised: "Whether there is a significant relationship between the application of management information system (MIS) and the human resource system employees' performance in Khuzestan Steel Company or not?"

To answer this question, we proposed an original hypothesis based on which the application of management information system (MIS) has a significant relationship with the human resource system employees' performance in Khuzestan Steel Company. According to the results of this research, we confirmed this hypothesis and the significant relationship between these two variables. In other words, the human resources system employees' performance in Khuzestan Steel Company is not unrelated to the management information system (MIS) in that company. It is indicated in this research that all performance indicators of human resource planning including the dismissal and relocation of human

resources, and career continuation are affected by the management information systems and in the case of such a relationship, we can improve the human resource system performance in Khuzestan Steel Company by applying the management information systems and updating these systems.

We have studied the effectiveness of each of the human resource system performance indicators by Friedman test. Human resources planning indicators in Khuzestan Steel Company have the minimum effect by the management information systems. By more familiarizing the users with the information systems, we can encourage them to apply the reports, information and statistics of management information system (MIS) and improve the speed and procedure of human resource planning process. Furthermore, given the low levels of human resource education indicators which are affected by the management information systems, we can encourage the human resource system employees in Khuzestan Steel Company to prepare the required training assessment and staff training programs by using the output reports, statistics and data of management information systems and starting a new stage of learning process.

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