#### **Sport Technology News**

# Investigating the Role of Management Information Systems Technology on the Performance of Sports Organizations

## Sajjad Pashaie<sup>1\*</sup>, Mir Davood Hoseini<sup>2</sup>, Fatemeh Abdavi<sup>3</sup>, Mehrdad Moharramzadeh<sup>4</sup>, Geoff Dickson<sup>5</sup>

- 1. Department of Sport Management, Faculty of Physical Education & Sport Sciences, University of Tabriz, Tabriz, Iran. Email: sajjad.pashaie@yahoo.com, ORCID: 0000-0002-3933-146X
- 2. Department of Sport Management, Faculty of Physical Education & Sport Sciences, University of Tabriz, Tabriz, Iran. Email: dhoseiny1990@gmail.com, ORCID: 0000-0002-9619-4051
- 3. Department of Sport Management, Faculty of Physical Education & Sport Sciences, University of Tabriz, Tabriz, Iran. Email: fatemehabdavi@yahoo.com, ORCID: 0000-0002-9746-4922
- 4. Department of Sport Management and Biomechanics, University of Mohaghegh Ardabili, Ardabil, Iran, Email: mmoharramzadeh@yahoo.com, ORCID: 0000-0002-8968-6883
- 5. Department of Sport Management, La Trobe University, Australia. Email: g.dickson@latrobe.edu.au, ORCID: 0000-0002-9913-0125

#### **ABSTRACT**

Technology and management information systems are a general strategy for dealing with the complexity of too much information and fragmented communications. The aim of this research is to investigate the role of management information systems (MIS) technology on the performance of sports organizations. The quantitative method used the questionnaire-survey. The MIS variables were information system quality (ISQ), information system strategy (ISS), and organizational size. Fifty participants were recruited from the Sports and Youth General Administration in Tabriz, Iran. Data were analyzed using SPSS and PLS structural equation model. The proposed model was supported by empirical data. More specifically, the results also showed positive and significant effects of ISQ, ISS, and organizational size on organizational performance; which implies that the higher the management information systems, the higher the organizations performance. Therefore, if management information systems are implemented properly, it will lead to user satisfaction; the system will also reduce administrative errors and assist in organizational decision-making.

**Keywords:** Management Information Systems, Communication, Organizational Performance, Strategy.

**Corresponding Author:** Sajjad Pashaie, Department of Sport Management, Faculty of Physical Education & Sport Sciences, University of Tabriz, Tabriz, *Iran*. Email: sajjad.pashaie@yahoo.com, Tel: 00(+98)9144856772.

#### Introduction

Information technology (IT) is used as a powerful leveraging tool to redesign business processes in organizations, allowing organizations to create new and integrated systems instead of gradually improving the status quo. Today, with the rise of technology, we are witnessing new advances in the world (1). The use of information technology is increasing day by day. Advances in communication and computer technologies allow an organization's employees to remain connected to their organization while working outside the organization and to work for the organization, or to minimize their distance from customers. In other words, organizations are moving towards virtualization using these technologies. Examples of these technologies are video communication, email, computer-aided design. Such technologies helps coordinate activities in the organization. Therefore, an organizations customer relationship management (CRM) technology can improve decision making in terms of service delivery, increasing intra-organizational communication, reducing costs, attracting and maintaining customers (2).

The sports industry has grown at an astonishing rate within the past few decades. One of the main reasons for this growth are management information systems (MIS). In the modern world, sport in terms of a public, intergenerational and demographic event, is the most popular form of public culture. It provides, more than other forms of culture, emotional attachment and a chance to be recognized and express oneself, create cultural leveling, and paves the way for social integration as well (3). Creativity, surveillance, and two-way interaction with other offices and staff are necessary elements for sports organizations (4). The effectiveness of these organizations depends on achieving the objectives, namely the development and expansion of physical education and sports in different groups and helps in improving the physical and mental health of young people. MIS are an important employee empowerment tool and the use of new technologies in an organization helps serve the community, youth and athletes better (5). "Information age", "explosion of information", and "information and communication technologies" are pervasive terms. The problem began with the information age. Taking decision making in a turbulent environment without access to relevant information is problematic. The design and deployment of systems and information technology are attempting to meet these basic needs in the information age (6).

The role of MIS is to provide necessary data, particularly to managers since the information managers need is different than at the management level. In other words, in designing information systems, we have to keep in mind the different levels of managers (operational management, middle management and top management), because this allows us to know the sources of information and ways to provide it (7). Measurements of information systems quality (ISQ) is a difficult task for scientists (8). Information systems quality can be measured as an information system that determines actual participation in the achievement of organizational goals (9). Similarly, to know whether outcomes can be attributed to MIS or techniques or not, is by no mean an easy process. According to Peter et al (2008), measuring information systems is both confusing and misleading (10). Thea Azeez & Bahari Yaakub (2019) research results showed, MIS indicators, namely information quality, user satisfaction and net benefits are directly linked with the organizational performance (11). Dillon and McLean (2003) created a model with 7 variables (i.e., information quality, service quality, quality system, intended use, application, user satisfaction, and net benefits) for measuring the success of information systems (12). User satisfaction is one of the most important criteria for strategic information systems (SIS) (13). Users of information systems expect them to be of good quality (14). The main factors that determine user satisfaction of information systems are the relevance of the content, accuracy, and performance (15).

Large organizations are generally more complex and need more formal information systems that can be classified as decentralized, specialized and integrated (16). Information systems and organizational structures help make a significant contribution to effective management decisions (12). However, the size of the organization is an important factor for the success of information systems because large organizations are

complex, and their information systems are of better quality and more complex. Therefore, the size of the organization is an important factor to design effective information systems (17). To have a successful MIS, one must-have information on its use in the decision-making process and prior to that, it should be equipped with a fast and secure path for receiving data and where commands are communicated. The flow of information plays an important role in the efficiency, effectiveness, and speed of information resources. This is including past data, current trends, and future plans. A management information system can also have sufficient flexibility and provide data from different organization projects and processes. They can be summarized and presented and delivered to relevant departments in case project managers make wrong decisions (15). Organizations with innovation can achieve benefits that directly or indirectly affect financial performance. This is the main goal of information systems (18). Therefore, in recent years, performance assessment has become one of the important concepts and become ingrained in the culture of organizations. New challenges and needs of the organization depend on their compatibility to follow the changes with adequate information systems and can affect the availability of the required information (19). Dibrell and Miller (2003) clearly chart the role of MIS in designing an organization. On the other hand, they eliminate the organizational complexity of information technology and reduce organizational levels (12). Ackerman and Wonder Hort's (2002) reported that with the decentralization of MIS, management's ability to manage the increasing complexity of organizations can be less formal (20). Fallah (2004), assert that managers of sports federations who became familiar with the benefits and features of MIS, also know about the inefficiencies of the traditional methods that provided information within the federation (5). But there was no significant relationship between information technology and complexity (21). Nowadays, the concept of MIS is of paramount importance to societies. This particular attention stems from the expansion of the communication channels and the increase in the amount of information exchanges on intranets and the internet. New organizations need to combine the advanced technologies and information architecture to achieve economic benefits through communication and information use (22). MIS is a kind of program for the content of information systems that plays an important role in effective information interactions (23). To fully understand the nature and the scope of online communications, not only we need to know all the key factors that affect these exchanges, but also, we need to get familiar with the components of the tools that contribute to success.

In the present study, it is intended to present a model of the influence of MIS on organizational performance. Today, sports federations of organizations are a valuable community and people in these organizations create confidence in the nation's activities and play a key role in the development of information systems. The importance of MIS has fascinated people in many disciplines, especially, management and organization. On the other hand, despite the importance of information systems in sports organizations, the supply of human resource qualifications is somewhat limiting, time-consuming and costly. However, in an era of ambiguity, this concept of organization and management is ripe for research. Therefore, we investigated the MIS model for the Sports and Youth General Administration in Tabriz. It was designed based on the reasonable needs of a university research unit in order to fix some of the problems and address the needs of its users.

In today's modern world, information technology plays an important role in the relationships of various communities. By sending different posts in various social media, people try to share, learn, get acquainted with places and individuals, create virtual experience and provide high quality services to the main audiences. These forums for discussion and debates make it possible to exchange information quickly. The need to identify up-to-date MIS models, especially the virtual and online models can play a valuable role in promoting the level of knowledge and services in the field of sport. The adaptation of these models to our country's specific conditions and the attempt to exchange knowledge with developed countries, can contribute to our success. To put it differently, identification of motivations and discussions about the amount and the method of using sport media, should be considered in order to help the growth of the sport industry. Therefore, the architects of the country's information structure need to prepare the infrastructure and cultural contents. They are also supported to collect

data and classify the audience and their motivations. Certainly, without the preparation of the sport digital media against the fundamental changes in information systems and services, one could not expect an information architecture project to succeed. We hope the result of this research will at least make a small contribution employee productivity.

#### Methods

In the present investigation, we aim to identify the key factors that impact the influence of MIS on organizational performance and to present a model based on information architecture. This is a goal-oriented basic research in terms of its objectives and uses empirical data to further develop our knowledge on this topic in the long run, in order to promote the level of scientific, social, and cultural interactions.

We examine the impact of MIS on the organizational performance of the Sports and Youth Department of East Azarbaijan Province in 2019. The people in the study are all 50 employees of the Sports and Youth General Administration in Tabriz. These people were selected as the statistical sample. To collect information, the questionnaires of Antoniou et al, (2015) (24) and Hosseinpour and Tabari (2016) (25) were used. The first part of the questionnaire includes demographic information, while the second part of Antoniou et al., (2015) is related to the size of the organization (OS), which is in the form of four questions. The third section relates to information systems quality (ISQ), in the form of five items. The fourth part of the questionnaire by Antoniou et al., (2015), was an information systems strategy (ISS), in the form of five questions that had been raised. In the final part of the research questionnaire, there are 5 items from Hosseinpour and Tabari (2016) (25), related to the performance of structures. This questionnaire is designed to help managers determine the cause of performance problems as strategy changes are designed to resolve these issues. According to researchers who translated the questionnaire, to ensure its validity, the wording of questions must be edited and questions that correspond to various topics have to be appropriate before being used in the research. The 5-point Likert scale is a rating scale questionnaire. Cronbach's alpha for the whole questionnaire was 0/79. Given that the Cronbach's alpha coefficient is larger than the standard value 0/70, we conclude that the questionnaire has good internal reliability. To analyze the data, the Kolmogorov-Smirnov test was used to determine the normality of the population and examine the hypothesis software SPSS. For testing the structural equation model, smart PLS was performed.

#### **Results**

Therefore, we conclude that the items reflect the latent variable. It should be noted that the factor loading value is between zero and one. If the load factor is less than 0.3, there is a poor relationships and discard it. Load factor between  $\geq 0.3$  to 0.6 is acceptable and greater than 0.6 is considered very desirable. In addition to the time factor should also be considered a meaningful indicator of operating a load value. So all the statements of the research are 60% percent more than the minimum amount, which represents the desired state of the statements of the research (Figure 1).

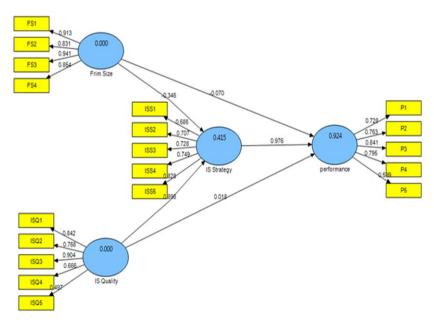


Figure 1. Factor loadings of items

Table 1 shows the validity of the compositions of each of the structures. Combined validity suggests that the reliability of the model must be boosted by modifying the model as well as removing low-value items. It should be done in phases to maintain the internal consistency of items. The results in Table 1 show that all structures are acceptable models and this represents the fulfillment of the condition for the reliability of the model. In this Table, we share the validity of the quality measurement model's construction of measures (before testing if the hypotheses are better to assess the quality of the internal model or structure. The quality's structural model means the ability to predict whether they are dependent variables or independent ones. In this case, the criteria used is cross-validation redundancy) and redundant or redundancy index taking into account the measurement model, as well as the quality of the structural model to measure the intrinsic structures. Share validity checking and validity is positive if the index indicates that the good quality measurement model is redundant. Therefore, the amount of variance is explained by awareness of the projected percentage change in variables used (average variance extracted must be greater than 0.5). To assess the external model, assumptions of variance extracted or «AVA», is used. The alpha reliability coefficient for all variables in this study is higher than the minimum amount of 0/79%, showing high reliability and optimal structures.

**Table 1.** Combined validity constructions

	AVE	Composite Reliability	R Square	Cranach's Alpha	Shared credit	Redundancy
Size of organization	0.78	0.93	0.56	0.91	0.61	0.61
IS Quality	0.56	0.86	0.57	0.79	0.34	0.34
IS Strategy	0.54	0.85		0.79	0.54	0.31
Performance	0.56	0.86	0.99	0.80	0.46	0.34

#### **Correlation among latent variables**

The latent variable correlation matrix and PLS algorithm test results show that the program is a smart PLS and correlation of hidden variables (constructions) (Table 2). It is necessary to place the numbers in a diagonal matrix and root AVE related to any structure is placed in front of the structure. It is essential that the AVE square root of each structure is correlated with other structures. This means that any number of columns is greater than the underlying numbers.

Table 2. Correlation between variables

	Size of organization	IS Quality	IS Strategy	Performance
Size of organization	1.00			
IS Quality	0.82	1.00		
IS Strategy	0.79	0.61	1.00	
Performance	0.80	0.55	0.95	1.00

The accepted reliability of the model can be reached by comparing the values obtained from the square root of the extracted variance values of the structures, and the «AVA» of the structures' model with correlation coefficients of each structure with other structures in Table 2.

#### Review and test the structural model

The structure modelling uses three criteria to test the hypothesis: path coefficients (Beta), the meaningfulness of path coefficients and R<sup>2</sup> values (or explained variance). The PLS algorithm test in smart PLS software shows beta coefficients in the path between the variables and significant amount of beta coefficients. R<sup>2</sup> values or the variance is explained. The smart PLS software shows the effect of the significant T value on variables. If the T value is greater than 1.96, it means that there is a positive and significant effect. If it is between +1.96 and -1.96, there is no significant effect and if it is less than -1.96, then it is statistically significant, and the effect is negative. If the path coefficients are higher than 0.6, then there is a strong correlation between the two variables. If the communication medium is between 0.3 and 0.6, the correlation is normal and below 0.3 shows a weak correlation. The numbers above 1.96 at 0.05 and above 2.58 at 0.01 are meaningful. In addition, if the latent variable path coefficient between independent and dependent latent variables is positive, we conclude that an increase in the independent variable will see a rise of the dependent variable and vice versa. If the latent variable path coefficient between independent and dependent latent variables is negative, we conclude that the increase in the independent variable will result in a decrease of the dependent variable. R<sup>2</sup> represents a model capable of describing the structure. In fact, the amount of R2 represents the model's fitness and shows what percentage of the dependent variable can be explained by the independent variables (Table 3 and 4).

**Table 3.** Results of path coefficient

Row	Directions (hypothesis)	Beta	T-test	Sig	Amount
1	Size of Organization → Performance	0.72	1.96	0.05	S
2	Size of Organization → IS Strategy	0.35	3.31	0.01	M
3	IS Quality → Performance	0.85	2.54	0.01	S
4	IS Quality → IS Strategy	0.46	7.58	0.01	M
5	IS Strategy → Performance	0.98	29.67	0.01	S
Note	S - Strong W - Week M - Middle				

S = Strong $\mathbf{M} = \text{Middle}$ 

**Table 4.** The Effects of Mediation

				Direct	Indirect	Total
Dependent Variable	path	Mediation Variable	Independent Variable	Effects	Effects	Effects
Size of Organization	&	IS Strategy	Performance	0.72	0.34	1.06
IS Quality	&	IS Strategy	Performance	0.85	0.45	1.30

#### **Findings**

After analyzing the data with the PLS software, the output is summarized in Table 3. To assess causal relationships between variables, a significant component of the index value "T" was used. The "T" value is, in fact, the main criterion hypotheses, and if the amount of data is in the order of 1.64, 1.96, 2.58 and higher, we conclude that the hypothesis has been approved with 90, 95 and 99% confidence levels.

Given the meaningful relationship between the research hypotheses, it is possible to test them. The results of the research hypotheses are based on structural equation modelling, causal pathways associated with regression coefficients and index details (Refer Table 3). All research hypotheses were confirmed at 99% confidence level. According to the findings, the final and conceptual model is as follows:

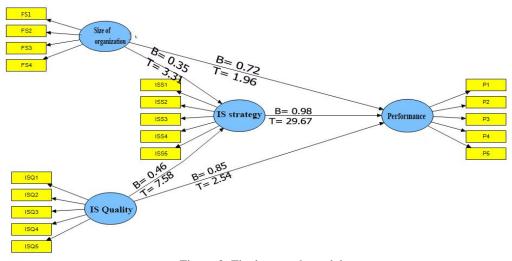


Figure 2. Final research model

#### **Discussion**

In today's world of systems and IT-based solutions, effective tools are increasingly used by sports organizations. The development of MIS has become a basic need for a variety of sports organizations to give a fillip to infrastructure systems. In recent years, investment in MIS nationwide has gone up and large, small, service or manufacturing, non-profit or other organizations are all opting for this technology. MIS in an era of accelerating environmental changes plays a vital role in organizational survival. MIS makes it possible to function smoothly for administrators and enables complex structures to be controlled and coordinated. In addition, this boosts the performance of the organization and management of the company is done with integrity. There is also scope for

immediate feedback. The results of this test showed that the structural equation model is a powerful theoretical model to predict the effectiveness of MIS. There is a significant and positive impact component of ISQ, ISS and organizational size on organizational performance. Based on these facts, the results of the model test research hypotheses were derived as follows:

The results of the study show that, the size of the organization directly affects the performance of the Sports and Youth General Administration in Tabriz. The research results are consistent with the findings of Antonio et al (2015) & Ranganathan, Kanabran (2004) (24, 26). Moreover, performance measurement is critical to the success of organizations because it will shape behavior and improve competitiveness. The size of the common goal of all management techniques or MIS shows that it makes it easier to assess their usefulness. So, we rely on MIS and find that large organizations are more willing to formalize it compared to other organizations. Between the increase in the size of the organization and the organization itself, there is a logical connection.

The results also showed that, ISQ directly affects the performance of the Sports and Youth General Administration in Tabriz. The research results of Antonio et al (2015) & Ranganathan, Kanabran (2004), are consistent (24, 26). Therefore, organizations with IS can maximize quality to achieve optimal performance or a more specific way to reach sustainable improvement in the profitability of an organization. Even if the MIS system's performance is improved and helps in achieving specific goals and offers choices, an organization may be willing to shift to new MIS. When organizations implement, use and are committed to the MIS, this often has a positive organizational impact, leading to better productivity or profitability.

The results of the findings showed that, a significant and positive impact was that the ISS directly affects the performance of the Sports and Youth General Administration in Tabriz. The research results of Antonio et al (2015) & Chan et al (2006), are consistent (24, 18). ISS is not always a sign of significant improvement in performance. Therefore, the ISQ covers activities related to research, evaluates and selects strategies as well as adopting measures inside and outside organizations to perform these strategies. It ultimately controls the activities being carried out. There is a strategic information system based on dynamic mentality and perspective. It is comprehensive and meets requirements. These are solutions to many of today's issues.

The results of the study showed that, the size of the organization had an indirect role in the information systems strategy that has had a major effect on the performance of the Sports and Youth General Administration in Tabriz. So far, no research (foreign or domestic) has been done in this field and in the component discussed in this research. Therefore, comparing previous studies in sports is not possible. When an organization hires more operational staff, the economic benefits of giving them specialized roles, as a result, will boost horizontal resolution. In addition, the expansion will lead to more complexity in the organization. As a result, the top management will not be able to directly monitor all activities within the organization, and the management will not have control. Finally, despite their limitations, accuracy, and fulfillment of objectives of organizational goals, size advantage is there. But intermediate objectives are often subjective because they are dependent on personal beliefs. Thus, the evaluation of performance targets may be dependent on job response.

The results of the study showed that, quality information systems indirectly have a mediating role which will have a good effect on the performance of the Sports and Youth General Administration in Tabriz. So far, no foreign or domestic research has been done in the field of sports; a quality information system can be measured as an information system that determines the actual role in achieving organizational goals. The quality information system can be measured by user satisfaction. Today, management information systems require the organization to provide information and data accurate. Procedures for data processing, collection, maintenance, use, sharing, and distribution is designed with specific strategies. A possible method of evaluating the effectiveness of management information systems is determining whether its objectives have been achieved or not. These systems are often not specific and well-defined objectives and are usually public. On the other hand, changing competitive conditions in the market as well as the information needs of users, the most important subjects have had a significant impact on information systems and the performance of organizations.

In general, we can say that the survey should consider issues such as the state's infrastructure for youth and sports, dating, organizational structure, stakeholders in the organization and the role of the government in planning and decision-making in the organization. Although the Ministry of Youth and Sports and leading organizations use MIS, we should take into account the digital relationships among the office of statistics and information technology of an organization, the Ministry of Youth and Sports, sports federations and National Olympic Committee, So, there is a limit. Using intelligence and sensitivity of information systems in organizations creates the direct impact of this information on issues and financial resources. They also reduce the strength and speed of information technology in organizations. Implementation of information systems at the Ministry of Youth and Sports increased organizational focus. So, we can that there is a direct relationship between information technology, centralization, and formalization.

From these findings, we see that if sports organizations want to improve the organization of creative people, they must learn to use the information system and empower people to do so. When people are empowered, their efficacy increases. Empowering people will not only boost competence, but also make people feel confident that they can do quality things. This will also help them take part in decision making and improve employee performance. Therefore, it is suggested that considering the issues and problems associated with the design, deployment, operation, and development of information management systems in sports organizations, it is important to consider in such a decision the decision of all public and private bodies. Because the deliberate and deliberate use of modern information technology in sport organizations, especially MIS, can improve the way of development, progress, and improvement of the country and increase their efficiency and effectiveness. According to the findings, if organizations implement various aspects of MIS, it makes it easier to take effective decisions and subsequently increases employees' productivity. Therefore, if MIS are implemented properly, it will lead to user satisfaction; the system will also reduce administrative errors and assist in organizational decision-making. The study recommends intensifying the awareness and training on the usefulness of the current management information systems. This can help to create an environment that is more conducive to the implementation of a more advanced system.

#### **Conflict of Interest Disclosures**

All the authors have stated there is no conflict to declare.

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#### چکیده فارسی

### بررسی نقش تکنولوژی سیستمهای اطلاعات مدیریت (MIS) بر عملکرد سازمانهای ورزشی

سجاد پاشائی $^{1}$ "، میر داوود حسینی $^{7}$ ، فاطمه عبدوی $^{7}$ ، مهرداد محرمزاده $^{1}$ ، جیاف دیکسون

۳،۱. گروه مدیریت ورزشی، دانشکده تربیتبدنی و علوم ورزشی دانشگاه تبریز، تبریز، ایران

۴. گروه مدیریت ورزشی، دانشگاه محقق اردبیلی، اردبیل، ایران.

۵. گروه مدیریت ورزشی، گروه مدیریت ورزشی، دانشگاه لاتروب، لاتروب، استرالیا.

#### چکیده

فناوری و تکنولوژی سیستمهای اطلاعات مدیریت، یک استراتژی کلی برای مقابله با پیچیدگی اطلاعات بیش از حد و ارتباطات پراکنده است. هدف از این تحقیق بررسی نقش تکنولوژی سیستمهای اطلاعات مدیریت بر عملکرد سازمانهای ورزشی است. در روش کمی از پرسشنامه استفاده شده است. متغیرهای MIS کیفیت سیستم اطلاعات (ISQ) ، استراتژی سیستم اطلاعات (ISS) و اندازه سازمانی بودند. جامعه آماری شامل مدیران و کارکنان اداره ورزش و جوانان تبریز(۵۰ نفر) بودند. دادهها با استفاده از SPSS و مدل معادله ساختاری PLS مورد تجزیه و تحلیل قرار گرفت. مدل معادلات ساختاری به کار گرفته شده، مدل نظری قوی برای پیش بینی موفقیت مدیریت سیستمهای اطلاعاتی است. به طور دقیق تر، نتایج تأثیرات مثبت و قابل توجه ISS ، ISQ و اندازه سازمانی بر عملکرد سازمان را نشان داد. این بدان معنی است که هرچه تکنولوژی سیستمهای اطلاعات مدیریت بالاتر باشد، عملکرد سازمان نیز بالاتر است. بنابراین، در صورت اجرای صحیح سیستمهای اطلاعات مدیریت، رضایت مندی کاربران را در پی خواهد داشت؛ همچنین این سیستم خطاهای اداری را کاهش داده و به مراحل تصمیم گیری کمک می-کند.

واژههای کلیدی: سیستمهای اطلاعات مدیریت، ارتباطات، عملکرد سازمانی، استراتژی.