# Analysis of relationship between using information systems and aspects of staff productivity based on Hersey and Goldsmith model

Rasool Heihavand Zavari Poor, Badri Shahtalebi *, Akbar Etebarian

*Department of Educational Science - Isfahan (Khorasgan) Branch - Islamic Azad University – Isfahan-Iran*

**Abstract:** The paper aims to analyze the relationship between using information systems and the aspects of staff productivity based on Hersey and Goldsmith model by descriptive method in correlation type in an industrial Company. All 800 employees of administrative sections in industrial Company took part in the statistical universe of this survey and 259 people were chosen by using convenience sampling method and Cochran's sample size formula. To collect data, a researcher-made questionnaire of using information systems with 23 questions, and the employee productivity questionnaire by Hersey and Goldsmith (1980) with 26 questions based on 5 degree Likert scale have been used. Also content validity and face validity of questionnaires in this paper were confirmed by experts and by using factor analysis in a group of statistical universe. The validity of both questionnaires were estimated by using Cronbach's alpha coefficient ($\alpha$) which equals to 0.85 in using information systems, 0.90 in employee productivity. Analysis of the data is done by using descriptive statistics (including Frequency, Percentage, and Mean, Standard deviation) and inferential statistics (including Factor Analysis, Pearson r, Analysis of Variance (ANOVA), Post-Hoc Test). The results show that there is a significant relationship between using information systems all aspects of productivity include of ability (r = 0.667, P< 0.01), clarity (r = 0.415, P< 0.01), help (r = 0.360, P< 0.01), incentive (r = 0.185, P< 0.01), evaluation (r = 0.445, P< 0.01), validity (r = 0.234, P< 0.01) and environment (r = 0.365, P< 0.01).

**Key words:** Information systems; Staff Productivity

## 1. Introduction

The economic development of societies in today's competitive world undoubtedly depends on their rate of productivity development (Taheri, 2013). Productivity is a comprehensive concept that includes all parts of society. So the experts of different sciences have considered it from different perspectives. Some national leaders and government managers imagine productivity as an antidote for all society illnesses. Other people interpret productivity as an answer to do more activities and more efficient. Economists think productivity is essential for the economic development and income increase of all parts of society. The organizations' managers interpret productivity as answer to increase competition and the instrument to decrease the product expense and benefit increase and therefore productivity engineers search productivity in timing plans, the better quality of developed goods, expense decrease, and the better efficiency of operation (Haghighat Joo and Rangriz, 2012). But in scientific literature, productivity that defines the relationship between output and input obtained results means especially useful and beneficial utility (Sing and Mohanty, 2012). The human resources are the main competitive advantage of every organization and the

organization, which has had more generative, and more abilities, is more successful (Stewart and Keneth, 2012). Undoubtedly today's changeable world develops with the knowledge-centered economy and human resources of knowledge base (Haghighat Joo and Rangriz, 2012). The information development and technological advances in these centuries have been formed the main foundation of economic and social revolution (Murthy, 2009). In this direction if the well-known perspective of Simon accepts on the basis of the synonym of management with decision-making and in the respect to the idea of some scientists that the correct decision is the decision which more than half of that decision is on the basis of information and another half depends on the skill, knowledge and the experience of the manager, so the value and importance of information get clear more than before (Movahedi, 1998). Information is the most efficient instrument of decision-making and principle foundation for the optimum productivity of human and non-human resources (Rasooli Azar, 2003). The information systems are technically a collection of related components that get, retrieve, process, save, and distribute information and so support correct decision-making and control the organization (Asefi, 2003). The computer information system is an information system that uses the computer and the telecommunication technology to do their functions. Information technology is a special part of an information system (Turban et al., 2012). Today the

information systems domain changes with more dynamic and speed in proportion to other commercial occupations, because information technology is the most important achievement instrument to the key purposes of the commercial companies (Laudon and Laudon, 2011). Information technology improves personal function between the knowledge staff, elevates the organizational function by using commercial processes and therefore develops the organizational function between organizations (Turban et al., 2009). Information systems can make supreme and distinction between the competitions (Clarck, 2010). So for this reason, many studies have been shown there is a positive two way relationship between the capital investment in information technology part, information systems and the office autoclave and the institution efficiency and productivity of human resources (Turban, 2004). Information system can effactually do affairs more quick, easy and carful and in this way they improve efficiency, also they provide the quality information for the managers to help them consider the condition and choose a better option and so they elevate the effect (Mohamadi et al., 2012).

## 2. Related works

In regard with correlation between using management information systems and productivity, several studies have been conducted as follows:

The research done by Pulling et al. (2002) called "the role of selling force autoclave (exploration consideration from the related organizational factors with the effective performance of system and productivity of selling force)" showed the function and therefore the organizational productivity increase when the realization atmosphere including sufficient education, the leader encouragement, facility, and the organizational support is formed.

The research done by R Martinez lorente et al. (2004) called "the effect of information technology on the organization function and the quality manager in Spanish industrial companies" showed the correlation coefficients between different criterions of the using information systems and information technologies and the use of the quality management that improves the organizational function is positive and meaningful.

The research done by Movafagh (2009) called " the effect of using information mechanism systems in the managers' decision- making" has been considered the effect of using information mechanism systems on the important factors of the managers decision- making includes the effect, planning, control, harmony, work process, strategy editing, and planning of human resources that after analyzing the received answers, it was clear that the use of information mechanism systems has been effected on the related decision- making for activities of organizational controls and harmony activities and work processes of the managers and the authorities.

The research done by Monzavi and Zare'e (2010) called "providing a model to explain the effective factors on the coincidence process of users with information systems in the engineering company of Iran naval installation manufacturing" showed that users understand the most negative aspects and results and they feel a threat when they evaluate and use the new system. Therefore the strategies which are chosen, although they have less effect on the efficient increase and function influence of users, they cause the negative results decrease from the entrance of the new system and the re-evaluation improvement of users and then the coincidence with the system.

The research done by Afsheh et al. (2011) called " consideration of using of information technology in education and its effect on productivity of the staff with the purpose of the consideration the effect of using the internet and internal network technology (intranet and extranet ) in education on the staff productivity" showed the use of two technologies in providing education to the university staff has been effected on productivity indexes include ability, resolution, encouragement and function feedback.

The research done by Tai et al. (2013) called " the documentation errors in precise instrument and electrical systems to productivity with the use of model-making of information system" showed in the conclusion of the using information system of management, nearly 94% frugality in expanse and the improvement of productivity can be obtained.

## 3. Research hypothesis

1. There is a relationship between the Using information systems and the Ability aspect of staff productivity.
2. There is a relationship between the Using information systems and the Clarity aspect of staff productivity.
3. There is a relationship between the Using information systems and the Help aspect of staff productivity.
4. There is a relationship between the Using information systems and the Incentive aspect of staff productivity.
5. There is a relationship between the Using information systems and the Evaluation aspect of staff productivity.
6. There is a relationship between the Using information systems and the Validity aspect of staff productivity.
7. There is a relationship between the Using information systems and the Environment aspect of staff productivity.

## 4. Conceptual model of the study

Fig.1 shows Conceptual Model of the Study according Hersey and Goldsmith model
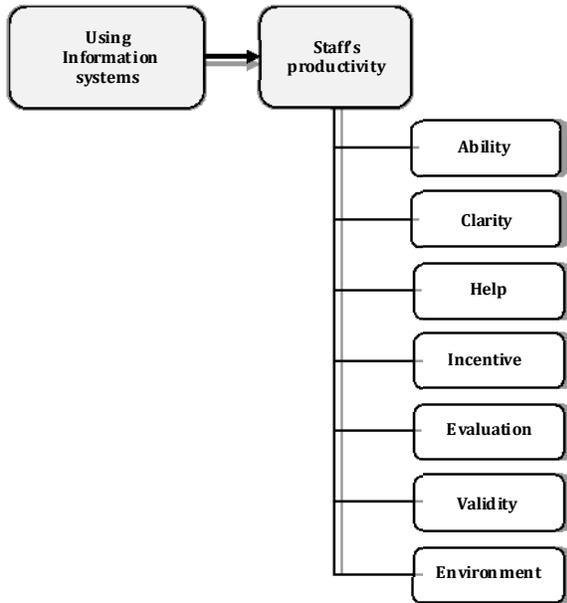
**Fig. 1:** Conceptual model of the study

## 5. Methodology

The paper is an applied research in terms of objective and its method is descriptive in kind of correlative method. Statistical population of the present study includes all employees of an industrial company in 2014 to 800 persons. Out of these individuals, 259 employees were selected as statistical sample using Cochran sample size formula and using available sampling method. Data collection instrument in this study has been alternative questionnaire of amount of using information systems with 23 items and questionnaire of Employee productivity of Hersey and Goldsmith (1980) with 26 items. Formal and content validity of the questionnaires were confirmed and also reliability of the questionnaires was estimated using Cronbach alpha respectively for questionnaire of using information systems to 0.85 and for Employee productivity to 0.90. For purpose of data analysis, statistical tests have been applied including factor analysis, Pearson coefficient of correlation, and Analysis of Variance.

## 6. Research finding

Hypothesis 1: There is a relationship between the Using information systems and the Ability aspect of staff productivity.

**Table 1:** coefficient of correlation between using information systems and the Ability aspect of staff productivity

| Predictor variable | using information systems | | |
|---|---|---|---|
| Statistical criterion | | | |
| Criterion variable | Coefficient of correlation | Square of correlative coefficient | Sig level |
| Ability | 0.667** | 0.445 | 0.001 |

P<0.01

The findings of Table 1 show that the correlation coefficient between the Using information systems and the Ability aspect of productivity is meaningful. That is, there is a meaningful relationship between the Using information systems and the Ability aspect from productivity (r= 0.667). The Using information system and the Ability aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 44.5% of variance. So the first hypothesis of the study is confirmed.

Hypothesis 2: There is a relationship between the Using information systems and the Clarity aspect of staff productivity.

**Table 2:** Coefficient of correlation between using information systems and the Clarity aspect of staff productivity

| Predictor variable | using information systems | | |
|---|---|---|---|
| Statistical criterion | | | |
| Criterion variable | Coefficient of correlation | Square of correlation coefficient | sig |
| Clarity | 0.415** | 0.172 | 0.001 |

P<0.01

The findings of Table 2 show that the correlation coefficient between the Using information systems and the Clarity aspect of productivity is meaningful. That is, there is a meaningful relationship between the Using information systems and the Clarity aspect from productivity (r= 0.415). The Using information system and the Ability aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 17.2% of variance. So the second hypothesis of the study is confirmed.

Hypothesis 3: There is a relationship between the Using information systems and the Help aspect of staff productivity.

**Table 3:** Coefficient of correlation between using information systems and the Help aspect of staff productivity

| Predictor variable | using information systems | | |
|---|---|---|---|
| Criterion variable / Statistical criterion | Coefficient of correlation | Square of correlation coefficient | sig |
| Help | 0.360** | 0.130 | 0.001 |

P<0.01

The findings of Table 3 show that the correlation coefficient between the Using information systems and the Help aspect of productivity is meaningful. That is, there is a meaningful relationship between the Using information systems and the Help aspect from productivity (r= 0.360). The Using information system and the Ability aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 13% of variance. So the third hypothesis of the study is confirmed.

Hypothesis 4: There is a relationship between the Using information systems and the Incentive aspect of staff productivity.

**Table 4:** Coefficient of correlation between using information systems and the Incentive aspect of staff productivity

| Predictor variable | using information systems | | |
|---|---|---|---|
| Criterion variable / Statistical criterion | Coefficient of correlation | Square of correlation coefficient | sig |
| Incentive | 0.185** | 0.034 | 0.001 |

P<0.01

The findings of Table 4 show that the correlation coefficient between the Using information systems and the Incentive aspect of productivity is meaningful. That is, there is a meaningful relationship between the Using information systems and the Incentive aspect from productivity (r= 0.185). The Using information system and the Incentive aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 3.4% of variance. So the fourth hypothesis of the study is confirmed.

Hypothesis 5: There is a relationship between the Using information systems and the Evaluation aspect of staff productivity.

**Table 5:** Coefficient of correlation between using information systems and the Evaluation aspect of staff productivity

| Predictor variable | using information systems | | |
|---|---|---|---|
| Criterion variable / Statistical criterion | Coefficient of correlation | Square of correlation coefficient | sig |
| Evaluation | 0.445** | 0.198 | 0.001 |

P<0.01

The findings of Table 5 show that the correlation coefficient between the Using information systems and the Evaluation aspect of productivity is meaningful. That is, there is a meaningful relationship between the Using information systems and the Evaluation aspect from productivity (r= 0.445). The Using information system and the Evaluation aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 19.8% of variance. So the fifth hypothesis of the study is confirmed.

Hypothesis 6: There is a relationship between the Using information systems and the Validity aspect of staff productivity.

**Table 6:** Coefficient of correlation between using information systems and the Validity aspect of staff productivity

| Predictor variable | using information systems | | |
|---|---|---|---|
| Criterion variable / Statistical criterion | Coefficient of correlation | Square of correlation coefficient | sig |
| Validity | 0.234** | 0.055 | 0.001 |

P<0.01

The findings of Table 6 show that the correlation coefficient between the Using information systems and the Validity aspect of productivity is meaningful. That is, there is a meaningful relationship between

the Using information systems and the Validity aspect from productivity (r= 0.234). The Using information system and the Validity aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 5.5% of variance. So the sixth hypothesis of the study is confirmed.

Hypothesis 7: There is a relationship between the Using information systems and the Environment aspect of staff productivity.

**Table 7:** Coefficient of correlation between using information systems and the Environment aspect of staff productivity

| Predictor variable / Statistical criterion / Criterion variable | using information systems | | |
|---|---|---|---|
| | Coefficient of correlation | Square of correlation coefficient | sig |
| Environment | 0.365** | 0.133 | 0.001 |

P<0.01

The findings of Table 7 show that the correlation coefficient between the Using information systems and the Environment aspect of productivity is meaningful. That is, there is a meaningful relationship between the Using information systems and the Environment aspect from productivity (r= 0.365). The Using information system and the Environment aspect from productivity has been common on the basis of the determination coefficient ($r^2$) 13.3% of variance. So the seventh hypothesis of the study is confirmed.

## 7. Experimental results

The result of Table 1 show that there is a meaningful relationship between the Using information systems and the ability aspect of staff productivity (r= 0.667). The results of this part of the research is proportionally along with the results of ( Afshe et al., 2011) on the basis of the positive influence of the using information technology on the ability components from human resources productivity.

The ability is defined the knowledge and skill and the experience of the staff. Empowerment is an important strategy to accommodate the development of different organizations with the changes in today's world. When the organizations want to empower the staff, information systems can consider as an important foundation in this issue. The most important effect of information systems to product the ability in the organization and its staff is to provide correct, on time, high quality information with suiTable expense.

The results of Table 2 show that there is a meaningful relationship between the Using information systems and the Clarity aspect of staff productivity (r= 0.415). The results of this part from the research is proportionally along with the results of ( Afsheh et al., 2011) on the basis of the positive influence of the using information technology on the aspect of the clear role from the human resources productivity.

The Clarity applied to comprehend and accept of work, place and the way to do it. Different users of every kind of system in organizations find a special

identification in continued interaction with systems. The accountant of a company, the manager of human resources, programmer, and the sell responsible and etc. find clear boundaries in their jobs identification. The atmosphere on that job whose part forms systems, determines a part of this boundary. On the other hand today, information systems related to each job give a new clear identification to the jobs.

The results of Table 3 show there is a meaningful relationship between the Using information systems and the Help aspect of staff productivity (r= 0.360).

The Help or organizational support is the generalized feeling and beliefs of people in this direction that the organization values cooperation and aid and support of its members. The organizations are able to do their duties easier by using information systems. Frugality in expense, avoidance of human errors, improvement of efficiency, and the influence are privileges of the use from information systems in organizations. Now information systems play the role of the main activities support in their domain.

The results of Table 4 show that there is a meaningful relationship between the Using information systems and the Incentive aspect of staff productivity (r= 0.185). The results of this part from the research are proportionally along with the results on the basis of: the positive effect of the Using information technology on the Incentive aspect of human resources productivity.

The Incentive is a factor that causes the human does the things with infatuation and seduction. The information causes motivation between staff by determination of the responsibilities and doing the things. The completion of staff knowledge and learning new knowledge are the strong Incentive factors for people by new information systems that these people have been covered their first needs.

The results of Table 5 show that there is a meaningful relationship between the Using information systems and the Evaluation aspect of staff productivity (r= 0.445). The results of this part from the research are proportionally along with the results of (Afshe et al., 2011) on the basis of: the positive effect of the using information technology

on the feedback aspect from human resources productivity.

Feedback (Evaluation) means the people must understand what they should do and know how to act on the basis of what is common. According to the systematic theories, organizations as open systems always need control processes to maintain the correct state and move in the direction of optimal condition. These processes can maintain or elevate the organization in the current state with feedback mechanism. Information systems had effected in presentation of feedback.

The results of Table 6 show that there is a meaningful relationship between the Using information systems and the validity aspect of staff productivity (r= 0.234). The results of this part from the research proportionally is along with the results of (Movafagh, 2009 ) on the basis of the meaningful and positive relationship between the using information systems on the effect of managers' decision- making.

Validity is applied to be proportional and legalize manager decisions about human resources. One of the most important roles is the instrument that helps managers make decisions. It's so clear the foundation of a valuable decision is to have quality information. Information systems with presentation of information that includes different quality aspects such as availability, the ability of trust and the avoidance of error and the ability of interpretation causes that decisions in every level have essential validity especially management levels.

The results of Table 7 showed that there is a meaningful relationship between the Using information systems and the environment aspect of staff productivity (r= 0.365). The results of this part from the research is proportionally along with the results (Monzavi and Zare'e, 2010) on the basis of the decrease of negative effects from the entrance of new information systems and revolution improvement and the coincidence of users with the system.

## 8. Conclusion

The results show that compatibility with the environment and other effective environmental factors on the function such as competition, market situation, approved laws, and suppliers are the environmental proportion. The organizations want to guarantee the function and productivity by the coincidence with the environment. It should be considered that not only accommodate the organizations with the environmental changes, accommodate systems to the organization must also accommodate with the environment and functions and the organization structure. The organization in which information systems aren't compatible will have inference in the date concentration. If the system users in the organization feel the new system has been increased their work attraction, they will interpret the use of the new system useful and if they feel the system has been without the easy use and

it's hard to use it, they will interpret it complex and then the feeling of fright from the lack of essential skill for working with system and the loss of job will cause.

## References

Afsheh A, Yekan far F, shaidi A (2011). Application of information technology in education and its impact on employee productivity, Islamic Azad University, Academic Journal Electronic learning (Media), 4: 1-11.

Asefi M. (2013). Assess the role of information systems in the organization using a balanced scorecard approach. M.A thesis. Isfahan Azad University (Khorasgan).

clark A (2010). Strategic Management of Information Systems comprehensive approach. 5th edition. Translator: M Arabi, D. Izadi, Tehran: cultural researches office .P.256.

Haghighat Joo R, Rangriz H (2012). Productivities and analysis in organizations. 1st. edition. Tehran: Termeh Press. P.288.

Laudon KS, Laudon JP. (2011). Management information systems. 3rd edition. Translator: R. Molana pour, F. Habibipour, M Karami. Tehran: Ati negar. P.727.

Mohammadi D, Mohammadi Y, Mohammadi A (2012). Management information systems with a comprehensive approach. 1st edition. Tehran: Barayand Pooyesh. P.314.

Monzavi T, Zare'e B (2010). A Model Presentation to explain the factors affecting the process of adaptation of users with information systems at Iranian Offshore Engineering Company. Journal of Information Technology Management, 5: 129-148.

Movafagh H (2009). Effect of using automated information systems in management decision making of manager of Imam Ali University. Military Management Journal, 34: 91-114.

Movahedi M, Abesi M (1998). A comparative study of the role of senior managers in the implementation and using information systems with an emphasis on DSS in the Iranian public systems and foreign countries. The Knowledge of Management Journal. 43. 24-52 p.

Murthy K (2009). Management Challenges in the Third Millennium. 1st edition. Translator: M. Iran Nejad Parizi, AS. Ahmad pour, Tehran: Modiran press. P.326.

Pullig C, Maxham JG, Hair JF (2002). Salesforce automation system an exploratory examination of organizational factors associated with effective implementation and salesforce productivity. Journal of Business Research, 55: 401-415.

R Martinez-Lorente A, Sanchez Rodriguez C, Dewhurst FW (2004). The effect of information technology on TQM: An Initialysis , Production Economics , 89: 77-93 .

Rasooli Azar S (2003). Content analysis and potential application of information technologies in Iranian farming systems. M.A thesis. Tarbiat Moalem UN.

Single R, Mohanty M (2012). Impact of traning practices on employee productivity: A comparative. Interscience Management Review, 2:87-92.

Stewart GL, Kenth GB (2011). Human Resource Management: Linking Strategy to Practice Wiley. 2nd edition.

Taheri Sh (2013). Productivities and analysis in organizations. 22nd edition. Tehran: Hastan. P. 386.

Tai Kim J, Love PED, Zho J, Pong Sing C (2013). Documentation errors in strumentation and electrical systems: Toward productivity improvement using system information modeling. Automation in Construction, 35: 448 – 459.

Turban A. Riner K. Pater R. (2012). The introduction on information technology. 3rd edition. Translator: A. Mostafavi, J Akbari, M. Mostafavi. Tehran: Naghoos Press. P.584.

Turban E (2004). Information Technology for Management Transforming Business in the Digital Economy. 4th edition. hong Kong.

Turban E, McLean E, Wetherbe J (2009). Information Technology for Management: Transforming Business in the Digital Economy. 6th edition**.**