Relationship Adoption of Information Technology and Innovative Performance (Case Study: One of the Country's Defense Industry)

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Abstract: This study aimed to determine the relationship between adoption of information technology and innovative performance in one of the defense industry were conducted. The aim of this study is applied and the method of cross-correlation. The study examined all employees are industry out of which 321 subjects stratified random sampling method were selected using Morgan table. To collect data, Zin questionnaires adoption of information technology (2005) Prajogo and Sohal questionnaire innovative performance (2003) and Gandhi used. Validity by a group of university professors was approved for content and face. The confirmatory factor analysis was used to determine the validity of the results showed factor loadings all the items of 0.05 that the show was a reliable assessment tool. Cronbach alpha coefficient reliability for the first questionnaire is 0.76 and for the second questionnaire 0.74. Using Pearson correlation and analysis spss software for research data analysis were used. The results showed there is a significant relationship between perceived usefulness and perceived ease of use and innovative performance. In addition, there is a significant relationship between the adoption of information technology and innovative performance. On the other hand, in this study to test the conceptual model of structural equation modeling using LISREL Software was used. The results showed good fitness and therefore as an experimental model presented.

Key words: IT, innovative performance, product innovation, process innovation, structural equation modeling

INTRODUCTION

Despite the advantages that the application of information technology to its manufacturing industries have with problems related to its use of various aspects such as individual, organizational, cultural and social face. Therefore, the need to conduct research on factors affecting the adoption and application of information technology in them, in recent years it has been felt. Individual factors such as perceptions and attitudes towards information technology staff and their demographic characteristics, includes the rate of adoption and the factors that affect employees' use of this technology.

Based on surveys of various models and approaches globally for aspects and factors affecting adoption of information technology including the most prestigious of which are employed, information technology of acceptance model which deals with the factors at the individual level. Several studies in various countries have adopted this model and its applicability is investigated. This model Davis *et al.* (1989) has introduced the first doctoral thesis.

According to this model, as seen by two factors "perceived usefulness" and "perceived ease of use"

formed. These two factors affect the attitude toward the use of technology, led to the decision to use the technology (Davis *et al.*, 1989). Due to these two factors, that most research has been carried out and the test results are directly related to technology adoption, researchers sought to examine the relationship between these factors has been studied innovation in the defense industry. Therefore, to measure the relationship between the two factors of "perceived usefulness" and "perceived ease of use" with innovative performance models use Davis has been shortened.

Studied the defense industry as one of the categories in the field of manufacturing factories in Iran are having multiple physical and human capital, to survive in the competitive market requires the adoption of new technologies, innovation and product innovation and new ways to attract customers in today's complex market. The industry must ensure the adoption of information technology among staff and then use the benefits of information technology to improve innovation in products and processes its own.

Review of the literature: One of the main elements of technology adoption research in recent decades has been associated with information systems. Various views of the

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users understand the factors influencing decision-making in relation to the adoption of information technology there (Lee *et al.*, 2011). In the intelligence community, organizations and government agencies to develop competitive advantages and focus on the appropriate use of information and communication technologies need, critical factor for success in today's market and measure e-readiness is the first step and these centers are to accept these new technologies.

Cutler's definition 2003 states the adoption of technology adoption, a unique decision that an ordinary consumer in relation to the use of the product. Technology Adoption in general as a methodology for evaluating the attitude and the use of technology by the user in multiple domains is considered (Jaghobi, 2008).

Innovative performance is with the development and deployment of new competence in communication (Nambisan, 2013). This concept in organizations, in the exploitation of existing competencies and make use of new opportunities rooted. Maximizing performance and trends Innovation management is often an important issue and significant topics raised is how best can we measure innovation performance.

Each of these individuals from their point of view and field of study of these categories is as innovative performance. According to Kang Yin and Zaskoich, Gerald, Evan Glista and Vazani, Hilmi and Skarlavich functional innovation including product innovation and process innovation (Gunday *et al.*, 2011). Innovative performance in this study with both product innovation and process innovation will be measured, the two dimensions in different research and innovation as an important dimension to assess innovative performance of organizations have been proposed. Manufacturing and service companies including the country's defense industry must equip themselves with knowledge and technology including information technology for survival in a competitive market, innovative performance in order to take steps to using information technology acceptance, product innovation and process innovation to improve in comparison with the rival. Therefore, this research is to study the relationship between the adoption of information technology and innovative performance in one of the country's defense industry.

According to the above example of the research that has been done on the subject within the country and abroad as follows: Mohammadi and Amiri identify factors affecting the adoption of IT innovations in the organization of government. The results showed that indicators such as comparative advantage and innovation capability, security and reliability, organizational culture, management support, socioeconomic status and cooperation between departments and organizations, play an important role in the adoption of IT innovations. Farhadi examined the effect of adoption of information technology on productivity of their workforce illuminate brick factory and found a significant correlation between perceived usefulness and ease of IT staff with a desire to use technology and human resources productivity.

Kahouei and Babamohamadi (2013), by nursing staff to review understanding of adoption of clinical information systems based on information technology acceptance model (research hospitals affiliated to Semnan University of Medical Sciences and Social Security) began.

The results showed that the adoption of information technology in nurses who were aware of their duties towards the computer program or computer program goals of those who were aware, were higher.

Mirkmandar and Zia (2013), the relationship between the use of information technology and creative atmosphere in Kerman executive systems pay and found that there are positive and significant relationship between the use of information technology and creative atmosphere and its components. Mohtarami and Ellahi (2013), identify factors affecting the adoption and diffusion of information technology in the country's businesses.

The results showed that factors such as perceived interests IT managers, size of the organization, stable management, supplier readiness of the organization, positive impact on IT acceptance information in relevant organizations.

MATERIALS AND METHODS

Conceptual model and research hypotheses
The main question: Whether there is a significant relationship between the adoption of information technology and innovative performance in the industries.

The main objective of the study: The relationship between the adoption of information technology and innovative performance in the defense industry under study.

Hypothesis H: There is a significant relationship between the adoption of information technology and innovative performance.

Hypothesis H_1: There is a significant relationship between perceived usefulness and innovative performance.

Hypothesis H$_2$: There is a significant relationship between perceived ease of use and innovative performance.

RESULTS AND DISCUSSION

According to Anderson (1998), the Cronbach's alpha values for the >0.7, the reliability of the measured variables of the model is confirmed. Variables of reliability are required. The findings of this study is to assess the measurement model through the research variables exploratory factor analysis using LISREL Software acquisition in the first and second order which continued to be discussed.

Measurement model: The study is used to evaluate the validity of the questionnaire, the confirmatory factor analysis approach that uses software to examine the validity LISREL done. As part of exploratory factor analysis were determined, the total questionnaire with 30 questions divided into four operating and to ensure the validity exploratory factor analysis using first and second order, this questionnaire will be examined. Measurement of this study is presented in the following model. This is done by first and second order confirmatory factor analysis.

First order confirmatory factor analysis of information technology adoption variable: The results indicate that the first measure correlated relationships between aspects of information technology of adoption variable. The model presented in Fig. 1 in standard mode which represents the desired form factor, is based on the items. Model parameters is also in good condition (Fig. 2).

As can be seen the statements of 15 persons, this variable is positive and significant factor loadings on their factors and two factors together are significantly correlated.

Second order confirmatory factor analysis of information technology adoption variable: The first model is shown in Fig. 3 according to standard estimates the results indicate the suitability of the model. χ^2 value is calculated according to LISREL output is equal to 442.75 which is appropriate.

In this model, χ^2 to df ratio of about 1.30. Low levels of this index indicate little difference between conceptual models with observed data research. In addition, the RMSEA is equal to 0.079. The index of less than 0.08 is appropriate. The measurement models in the standard estimate the impact of each variable or items variable in explaining the variance or the primary factor. The p-value is <0.05. All of this showed is that can be adjusted according to the results of confirmatory factor analysis, structural work was based on information technology adoption.

First order confirmatory factor analysis innovative performance variable: The results indicate that the first measure of positive correlation between innovative performance variable dimensions. The model in Fig. 4 is provided in standard mode that shows the formation of the desired item is based. Model parameters is also in good condition. As can be seen the statements of 15 persons, the variable positive factor loadings and striking out on each factor and two factors together are significantly correlated.

Second order confirmatory factor analysis of information technology adoption variable: Innovative performance measurements in accordance with the standard model estimates shown in Fig. 5, the results indicate the suitability of the model. According to the LISREL output value of χ^2 is calculated that the right amount is equal to 283.67.
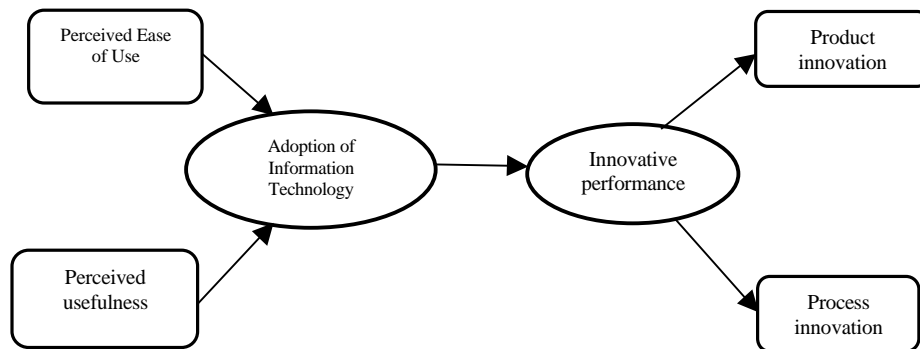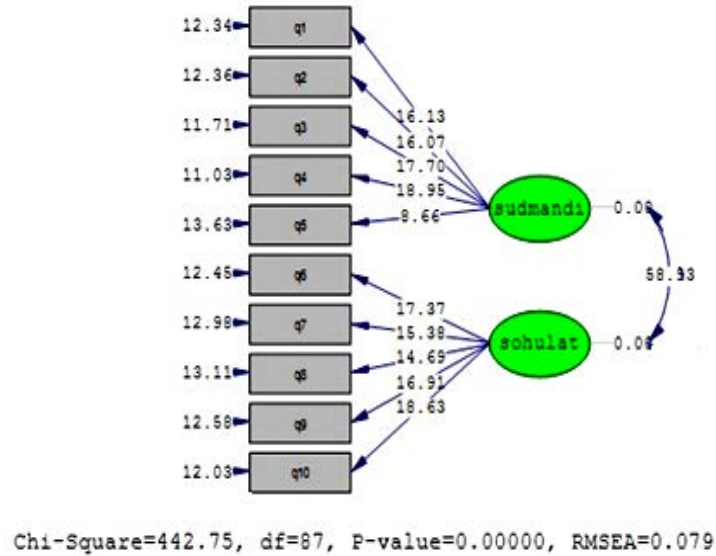

Fig. 1: Conceptual model research

Fig. 2: Confirmatory factor analysis estimated first-ranging adoption of information technology in the standard model
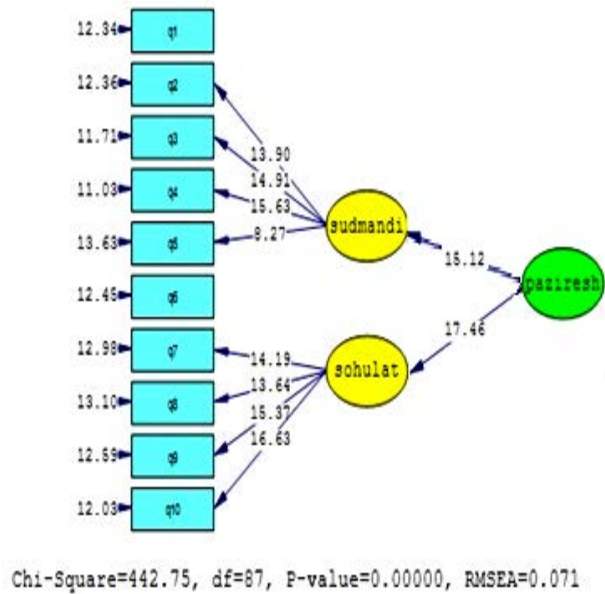

Fig. 3: Confirmatory factor analysis estimated second-ranging adoption of information technology in the standard model

In this model, χ^2 to df ratio of about 2.71 which is good. Also, the RMSEA equal to 0.078 which indicates that the model is a better fit. The measurement models in the standard estimate the impact of each variable or variable item in explaining the variance or the primary factor. The $p < 0.05$. All of this showed is that can be adjusted according to the results of confirmatory factor analysis, structural work was the basis for innovative performance.

Structural equation modeling: After examining the validity of the measurement models and confirmatory factor analysis can be based on structural model investigated the relationships between variables. Thus, in order to verify current hypothesis of relationships based on structural equation modeling was used. Figure 5 test basic hypotheses using structural equation modeling shows.
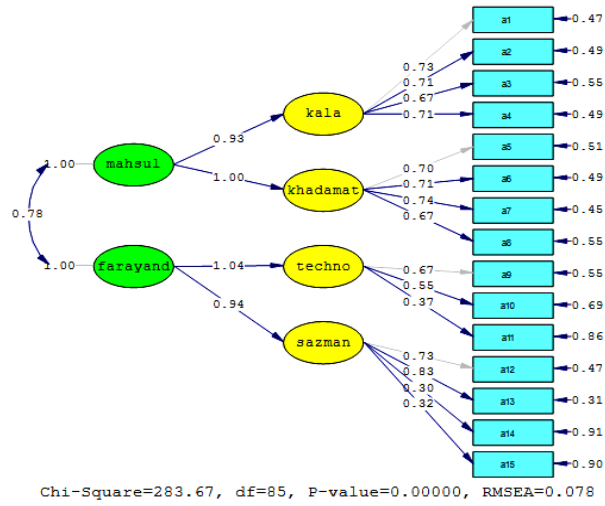
Fig. 4: Confirmatory factor analysis first innovative performance variable in estimating the standard model
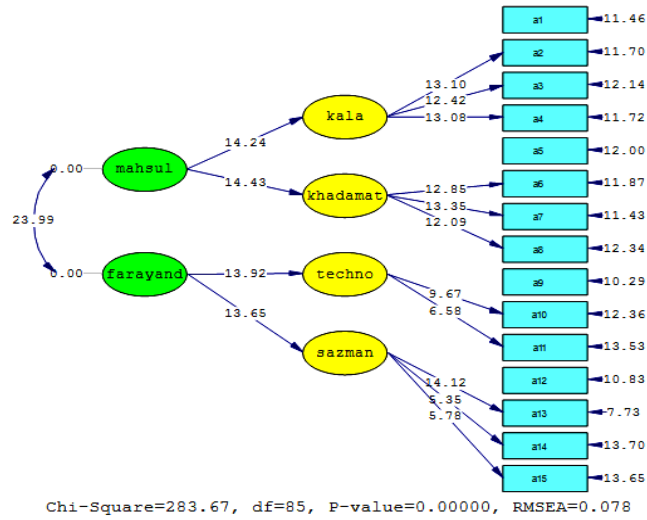

Fig. 5: Confirmatory factor analysis innovative performance in the second variable standard estimation model
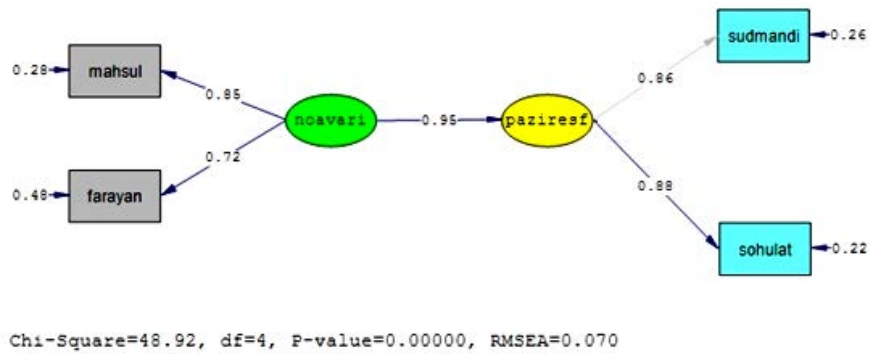

Fig. 6: Model in standard mode

Model fit indices indicate that the model terms of suitability and fitness in good condition because of the degree of freedom Chi-square is equal to 1.86 and RMSEA value is equal to 0.07. A p-value of 0.000 as well as GFI and AGFI is 0.95 and 0.82. Hence, it can be concluded that the model is implemented appropriately.

CONCLUSION

The main research findings of the study, states: according to the correlation coefficient between adoption of information technology and innovative performance (0.244), the significant level 0.000 and 95% confidence level, the innovative performance and adoption of information technology, has a significant relationship with each other. This result is consistent with the results obtained in the investigation by Mirkamandar and Zia (2013) have been carried out, aligned. On the one hand, results with the findings of research conducted by Mohtarami and Ellahi (2013) are incompatible. Therefore, adoption of information technology, should as appropriate in order to create incentives for innovation and as a result, improve innovative performance, should be considered. The results of the study show that the first hypothesis: according to the correlation coefficient between perceived usefulness and innovative performance (0.487), at a significance level of 0.000 with a confidence level of 95%, perceived usefulness and innovative performance, has a significant relationship with each other. The findings of the study also states that the second sub: according to the correlation coefficient between perceived ease of use and innovative performance (0.477), a significant level of 0.000 and 95%, perceived ease of use and innovative performance, has a significant relationship with each other. According to the results of the second and third test hypotheses of this study, it is essential that designers and builders or buyers of information technology systems related to two factors "perceived ease of use". Moreover, "perceived usefulness" in the industry to design systems required to consider and systems design or buy while useful, they learn to use, easy. Innovative performance, with the knowledge required for product development and new manufacturing processes, or improvement of existing processes, are achieved. Industry can by highly proficient in the production of knowledge through higher-value products a higher rate of growth and achieve a more promising business conditions. That is why these industry executives around the world to create policies that invest in research and development, to stimulate and improve the efficiency of innovation processes have been tried. In a company with extremely high-tech, innovation is critical.

In high-technology industries, where high switching speed steps, now more emphasis on efforts in research and development of products, processes and technologies that thereby overcome technological barriers and to distinguish its products from rival companies. As a result, the industry wants to be innovative performance must strengthen the research and development which makes its product development and manufacturing and service processes as well as considering the relationship between technology adoption and product innovation and process information, must have full regard to the adoption of information technology as it is created by them innovative performance. We strongly recommend that industry executives have studied special attention to this matter.

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