EVALUATING IMPACT OF THE QUALITY OF IT COMPONENTS TO IMPROVE TECHNICAL PERFORMANCE OF VALUE ENGINEERING (VE)

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Abstract
The main objective of this study was to evaluate the impact of independent variables, including the characteristics of the hardware, software, brain ware and network environment on the dependent variable including performance of value engineering. Method of this study in term of objective is applied and in term of method and nature is a descriptive and finally method of data collecting is field. All civil managers and experts in municipality of Hashtgerd (Iran) are considered as statistical population (60 civil managers and experts) and number of samples has obtained 52 that 55 questionnaire is distributed. Sampling method in this study has been simple random sampling. Questionnaire is considered as tools of data collection. To test hypotheses are used regression method. Result of testing hypotheses show that the characteristics of the hardware, software, brain ware and network environment affect performance of value engineering.
Keywords: Value Engineering, Hardware, Software, Brain Ware, Network Environment

1. Introduction

Every year a large part of the funds and financial resources spent on investments in major projects of civil and industrial, while on average these projects at national section and at the provincial and district are faced with more than 50 percent of delays in the progress work. Delays in progress of the work, in addition to prolonged running time and spending considerable cost to restart or to complete them, also will result in imposing costs of lost opportunities on economic sectors of operation and untenable projects in the later stages. In other words, over time, changing technology and information technology and changes in environmental conditions and social may make unjustifiable projects that are technically and economically feasible at one time in new condition (Gilaninia & et al, 2013a). On the other hand the lack of sufficient scientific and experimental deployment in stages of the initial survey and design would impose heavy costs on the project and thus encountered a serious problem in project's completion. To solve these problems have been proposed methods, techniques and numerous theories by different people (Deng & et al, 2010). But in today's world that providing science and human knowledge with all fast-moving developments are on

the road these techniques and theories have failed associated with it or combined with other techniques have been tried in survival. Meanwhile innovation Miles (father of value engineering) with a lifetime of over 60 years in the scientific community still maintains its position and it is growing every day users and researchers. The purpose of value engineering is a change in the performance of products in order to reduce costs. In the 60 Bith way integrated method of system analysis FAST with it and in the same year America Navy added reward system to it in form of function VECP. In later years, techniques such as brainstorming, Delphi evaluation method, AHP, weighted matrix and problem solving Peña, were integrated with it. result and research and experience many years of the researchers has found now technically practical and proven by various names such as value engineering, value management, value analysis, value methodology, comprehensive value management and …. Thus value engineering as an efficient technique to meet project goals with minimum cost and maintain quality has found better position than other techniques to improve the efficiency in construction projects in developed and developing countries, and in terms of flexibility in development potential and improvement of these techniques now also countless research or testing is being done to enhance its efficiency and there is infinite space for research and studies on other aspects it. On the other hand with the development of information and communication technology issues, use it in all cases become as a matter of course and with high efficiency. IT is the use of computers and other technologies for working with information. Generally in information technology mistakenly, working with information and communication be considered only via computer technology and related products. In case that technology is what use of man-made in achieving the goals and objectives such as providing goods and services. In continue it will investigate the characteristics, features and value engineering applications and information and communication technology and explore the possibility of value engineering optimization using tools and the benefits of information and communication technology (Rai & et al, 2012).

2. Problem Statement

Source of value engineering in other countries has been impressive and statistics indicate creating a significant savings in plans. A study conducted on five reports of the value engineering have shown that savings has been between five and thirty-five percent of the initial cost. Information technology as a tool and platform development in global competition for organizations has countless advantages (Gilaninia & et al, 2013b). In the modern competitive environment, all industries are located in exposure a technology developments (Gilaninia & et al, 2012c). Effects of the application of IT in industry and other organizations in all areas are very wide. Nowadays information technology in each of the large chain ring of value is practical and effective. Information systems that were used in the past decade have been the weakness or lack of benefit that is same as integrity of the system (Yavas, 2007). As can be seen in the value engineering, activities within the organization are interconnected with each other. This relationship allows planning each of these activities in the value chain; we need information from other functional areas. Hence integration of information systems facilitates and accelerates the enterprise resource planning. Reduction of additional activities and surplus activities, comprehensive and detailed planning and achieving decisions more accurately are integration benefits (Gilaninia, Sh ,et al 2011). Considering the trend of business and topics such e-business of organizations inevitably over time is driven to the use of enterprise resource planning systems. What the existence of integrated information

systems necessitates the move to e-business and competition in the future years (Mithas & et al, 2012).
Construction row figures of the annual budget of the country indicate suitable field for the application of value engineering. For example, figure of parliament approved budget for development projects in 2014-2015 has been the 37 thousand and 805 billion Tomans (Iran) and if you consider that the experience of others represents a minimum savings of 5% compared to the initial forecast of projects budget, can estimate approximately savings resulting from the application of value engineering over year 2014-15, equivalent to 1.890 billion. However, the status of development projects in Iran in terms of both design and implementation practices and standards is poorer than countries that apply of value engineering is needed in them and in case attention to distance of the executive scientific of engineering community in Iran with these countries we can see that value engineering tool can be very useful and would cause the government to reduce the cost of enforcement activities. Therefore, in this study we want to measure impact of the IT component on the performance of value engineering that IT components including hardware - software and brain ware and network environment.

3. Research Hypotheses

1. Characteristics of hardware (HW) in the information system affect the performance of value engineering (POVE).
2. Characteristics of software (SW) in the information system affect the performance of value engineering (POVE).
3. Characteristics of brain ware (BW) in the information system affect the performance of value engineering (POVE).
4. Characteristics of net environment (NET E) in the information system affect the performance of value engineering (POVE).

4. Definition of Research Variables

Hardware: A set of physical components that comprise a computer system. Computer hardware is the physical parts or components of a computer, such as screen, keyboard, computer memory, hard disk, mouse, printers, CPU utilization (graphics card, sound card, memory, motherboard and chips) and all the physical components that can be touched (saw) (sbu.ac.ir).
Software: Software or program, a set of detailed instructions and step by step that specific followed objective (wikipedia.org).
Brain ware: it consists of experts in the field of information technology that can take advantage of available hardware and software (Behpardazan.com).
Net environment: In short, it is often said network, a group of computers and devices that are connected by communication channels. Computer network facilitate communications among users and allows users to share their resources (wikipedia.org).

5. Research Methodology

Method of this study in term of objective is applied and in term of method and nature is a descriptive and finally method of data collecting is field. All civil managers and experts in municipality of Hashtgerd (Iran) are considered as statistical population (60 civil managers and experts) and number of samples has obtained 52 that 55 questionnaires are distributed. Sampling method in this study has been Simple random sampling. Questionnaire is considered as tools of data collection. It is designed based on previous research and also their

validity has confirmed by supervisor and some experts. Cronbach test results show that the questionnaire has been reliable. Descriptive and inferential statistical methods are used to analyze data. In descriptive method is used indicators of such as mean, frequency and standard deviation and to test their hypotheses in inferential statistic are used regression method.

6. Research Findings

Table 1: result of regression test

Hypotheses	R	B	t	Sig	Result
First sub-hypothesis	0.988	1.164	8.964	0.000	Confirmed
Second sub-hypothesis	0.978	1.165	24.776	0.000	Rejected
Third sub-hypothesis	0.976	2.164	33.404	0.000	Confirmed
Fourth sub-hypothesis	0.892	1.234	10.439	0.000	Confirmed

1. Characteristics of hardware (HW) in the information system affect the performance of value engineering (POVE).

According to error calculated for the first hypothesis (0.000) is less than 0.05, thus hypothesis is confirmed. So it can be said that hardware characteristics have significant effect on the performance of value engineering. In addition to above cases, according to the determination coefficient obtained, hardware characteristics can explain 64 percent of the variance in the dependent variable of the value engineering. Also according to information about hypothesis 1 to test significant of above hypothesis that its correlation is 0.988, research variables with respect to 95% confidence level by using the T-test statistic tested and its value obtained 8.964 and since calculated t to variable of hardware characteristics are not between +1.96 and -1.96, therefore, this factor is significant and variable of hardware characteristics has significant impact on performance of value engineering. According to the coefficient of B (slope of regression) obtained to variable of hardware characteristics (1.164), shows that for a unit change in the variable of hardware characteristics, the variable of value engineering changes 1.164 and regression equation between these two variables will be as follows:

Performance of value engineering= 0.841+ 1.164 (Hardware characteristics)

2. Characteristics of software (SW) in the information system affect the performance of value engineering (POVE).

According to error calculated for the second hypothesis (0.000) is less than 0.05, thus hypothesis is confirmed. So it can be said that software characteristics have significant effect on the performance of value engineering. In addition to above cases, according to the determination coefficient obtained, software characteristics can explain 95 percent of the variance in the dependent variable of the value engineering. Also according to information about hypothesis 2 to test significant of above hypothesis that its correlation is 0.978, research variables with respect to 95% confidence level by using the T-test statistic tested and its value obtained 24.776 and since calculated t to variable of software characteristics are not between +1.96 and -1.96, therefore, this factor is significant and variable of software characteristics has significant effect on performance of value engineering. According to the coefficient of B (slope of regression) obtained to variable of hardware characteristics (1.165), shows that for a unit change in the variable of software characteristics, the variable of value

engineering changes 1.165 and regression equation between these two variables will be as follows:

Performance of value engineering= 8.33+ 1.165 (software characteristics)

3. Characteristics of brain ware (BW) in the information system affect the performance of value engineering (POVE).

According to error calculated for the third hypothesis (0.000) is less than 0.05, thus hypothesis is confirmed. So it can be said that brain ware characteristics have significant effect on the performance of value engineering. In addition to above cases, according to the determination coefficient obtained, brain ware characteristics can explain 97 percent of the variance in the dependent variable of the value engineering. Also according to information about hypothesis 3 to test significant of above hypothesis that its correlation is 0.976, research variables with respect to 95% confidence level by using the T-test statistic tested and its value obtained 33.404 and since calculated t to variable of brain ware characteristics are not between +1.96 and -1.96, therefore, this factor is significant and variable of brain ware characteristics has significant effect on performance of value engineering. According to the coefficient of B (slope of regression) obtained to variable of hardware characteristics (2.164), shows that for a unit change in the variable of brain ware characteristics, the variable of value engineering changes 2.164 and regression equation between these two variables will be as follows:

Performance of value engineering= 0.741 + 2.164 (brain ware characteristics)

4. Characteristics of net environment (NET E) in the information system affect the performance of value engineering (POVE).

According to error calculated for the fourth hypothesis (0.000) is less than 0.05, thus hypothesis is confirmed. So it can be said that net environment characteristics have significant effect on the performance of value engineering. In addition to above cases, according to the determination coefficient obtained, net environment characteristics can explain 79 percent of the variance in the dependent variable of the value engineering. Also according to information about hypothesis 4 to test significant of above hypothesis that its correlation is 0.892, research variables with respect to 95% confidence level by using the T-test statistic tested and its value obtained 10.439 and since calculated t to variable of net environment characteristics are not between +1.96 and -1.96, therefore, this factor is significant and variable of net environment characteristics has significant effect on performance of value engineering. According to the coefficient of B (slope of regression) obtained to variable of net environment characteristics (1.234), shows that for a unit change in the variable of net environment characteristics, the variable of value engineering changes 1.234 and regression equation between these two variables will be as follows:

Performance of value engineering= 1.108 + 1.234 (net environment characteristics)

7. Conclusion and Recommendations

Result of testing hypotheses show that the characteristics of the hardware, software, brain ware and network environment affect performance of value engineering. Thus according to the results obtained the following suggestions are offered:

- It is recommended that invest to promote and support of organization systems that this has a significant impact in enhancing performance of value engineering in the organization.

- Enhancing software efficiency will improve performance of value engineering, investments to enhance software features related to information systems is very important.

- Characteristics of brain ware in information system affect performance of value engineering. In this regard, the empowerment of staff in the use of software systems needs to train and investment that it should be noted by managers and employers.

- Characteristics of network environment in information system affect performance of value engineering. The high level of communication with the network environment will reduce costs of organization and also enhancing staff efficiency. Improving the quality of the network environment is significance components in value engineering.

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