Analysis of the Relationship between Information Technology and Activity Based Costing in the Iran-Khoy Telecom Company

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Abstract

In the 21st century, information – as a valuable and strategic commodity and a factor of development has an important role among power tools and it gradually has become the basic factor to make countries and organizations powerful. The Activity Based Costing is one of the variables that IT can be involved in. In this study researcher tries to answer this question that what is the relationship between IT and Activity Based Costing with two sub-hypothesis. The main purpose of the present study is applied and its method is descriptive-survey. The statistical population of this study is employees of Iran-Khoy Telecommunications Company. According to Iran-Khoy Telecom Company the number of employees in this company is 68 so due to low population, total number of the employees considered as the statistical population and census method was used. Analysis of variance was used to test the hypotheses. Results of hypothesis testing showed that there is a correlation between the variable of Information Technology and variable of Activity Based Costing (with two dimensions of Cost Assignment View and Process View) that were calculated sequence 0.54 and 0.46.

Keywords: Information Technology, Activity-Based Costing, Iran-Khoy Telecom Company.

Introduction

There are a few countries that are aware of the cost of public services. Without this information, the optimal assignment of resources would be almost impossible. However, because of the poor performance, managers are rewarded generally. For example, increasing the crimes causes the police to get more budgets, and if the students fail to earn proper results, tuition and resource entrance will be increased. Accordingly, lack of information causes many governmental agencies not to be responsible. And to access to such vital information it is necessary to establish advanced systems of government accounting. Governmental agencies that use large amount of community resources need management accounting more than other organizations. Information derived from management accounting systems can play an important role in meeting the monitoring systems, performance appraisal, motivation of managers, planning, optimum resource assignment, and it helps managers on their decisions and improving performance of governmental agencies can be accountable to the people (Vahedi et al., 2011). Meanwhile, officials
are looking for proper ways and strategies for improving their productivity to respond to people's expectations. In the public sector increasing revenues cannot be useful, therefore true management culture moves toward increasing the efficiency of costs. Certainly, today's society demands for productivity more than side requirements such as seasonal cost control. Thus, Activity Based Costing system meets the needs for increasing productivity and correct calculating of the cost of activities and services. And compared with other costing systems, ABC optimized performance by financial managers and governmental agencies accountants have significant advantages to society. In this regard Hassan Abadi, Najjar Sarraf (2007) argues that organizations with high overhead costs and variable administrative activities and services can organizations that profit from ABC. Therefore, most of the state's administrative agencies can use this approach. Activity Based Costing illustrates costs treatment and specifies cost of governmental agencies various activities. Also it helps managers to plan and make decisions and leads them to identify and trace the direct and indirect costs and to accurate allocation of them to activities that are involved in the production process of a product or service. In this system, the manufacturing or service delivery cost of each activity will be compared by cost standards. Finally, by analyzing the performance of each of the activities, funding is allocated according to workload of the executive agency (Anderson & Weitz, 2007).

The two-dimensional model of the ABC system is designed to provide information with the goal of creating a permanent improvement process for inside and outside activities and has two main approaches:
A) Cost Assignment View
B) Process view

Cost Assignment View provides information about resources, activities and cost object. The process view provides information about the tasks that are done in an activity and the relationship with another activity. Cost Assignment method in ABC represents the progress of cost from resources to activities and from activities to the cost object. For this purpose, in the cost allocation we use resource bases for assigning resources to activities and activity bases to sharing costs for each activity to the cost object. The result of this approach gives manger useful information to improve the performance of different parts of the organization. To further understanding of how components of Cost Assignment View are related in the model of ABC, the mechanism of their relation are described to achieve cost object.

The first element of the cost allocation model using ABC is «sources». Resources are the economic elements that are used to achieve the cost object and actually are the source of cost. In an organization resources are assigned to activities based on the related driver and flow into the activity. Activities make things happen. In order to organize and do it well, related activities lie in an Activity Center. The Activity Center is a cluster of related activities that can be categorized in terms of tasks or processes. Activity Resource is used to assign resources to activities. Resources that are assigned to activities, the cost of have cost and the components of this cost are Cost Elements. The cost elements of an activity form its cost pool and the cost pool reflects the total costs of an activity. The cost of each activity pool shifts by cost driver (activity driver) to cost object. Actually the cost object is reason of doing activity in an organization that can be a specific service to a customer.

Second dimension of ABC system is Process View. This view gives information about tasks that are done and the factors affecting them. Such as, how can we do tasks better, which activities are not necessary in achieving cost

![Figure1. Mechanism of components of ABC system- Cost Assignment View.](image-url)
object, and how can we measure approaching activities and their effectiveness in achieving cost object. Elements forming this view are cost driver and performance evaluation. Today by the invasion of the third wave, all previous hypotheses are questionable. The overcrowded society that companies and organizations are designed for it has begun to be uncrowned. Not only the information of production and household but also the goods market and the labor market are gradually divided into smaller and more varied components (Toffler, 1998). Less than three decades ago, when the informational revolution was felt, and elites were trying to image the future situation, Elvin Toffler in his book, The Third Wave, tried to image the floppy drive technology by the lots of words, but now that is meaningless in the information transmission. In the last three decades, the pace of these developments has changed all the governing paradigms (MirMuezzi & Seyyed, 2010). The revolution of information technology has changed all social, economic and even political areas of world and has influenced different areas of human life. All current concepts in various activity domains have been converted to a new concept by obtaining the letter E. Activity Based Costing derives from this belief that products consume activities and activities consume as well. In this method, activity is emphasized as the cost subject, because activity is the main cause that makes cost. In this case Rao et al (2002) argues that activity is the heart of ABC. In this method it is assumed that activities are cost drivers and outputs generate demand for activity.

Information Technology simply means the use of a series of instruments. These instruments are processing, storing, collecting, storage, distribution, transmission and security that are applied on the information. Sources of information are human intelligence and insight and the target using IT in order is to increase awareness and order of human in performance. Main bases of IT are hardware, software and brain ware or thought ware (Rahnamay Roodposhti, 2009). According to the above, information has the main role in both variables, and the relationship between Information Technology and Activity Based Costing can be in line with each other. The aim of the present study is to find the relationship between Information Technology and Activity Based Costing, and to assist policy making in the field of applying ABC in the Khoy Telecommunications Company and also to use IT for achieving the intended goals. According to the above, this study is to answer this question that what is the relationship between IT and Activity Based Costing in the Khoy Telecommunications Company.

**Background research**

- Professor Robin Cooper is one of the former scholars of Activity Based Costing. Cooper and Slagmulder (1998) presented strategic model in article collection of management accounting. The aim of model was to use Activity Based Costing in Strategic Management. Their study attempted to explore the relationship between strategy of the company, cost structure and cause and effect relation between activity levels and resource requirements (Cost Driver).
- Researchers presented another study in the field of the Hospital Industry from 1995 to 1997 that examined the impact of Information Technology on financial performance. In this study, the relationship between IT and financial performance in 1996 and 1997 was insignificant and in 1995 there was a significant relation. Similar researches by Hilton et al (2008), Krumwiede (1998), Anderson and Weitz (2007), Brimson (1998) has been made.
- SarrafiZadeh (2011) has discussed the role of Information Technology to gain a competitive advantage. According to this model, information technology increases the product's unique features through customizing products according to customer demands and interests. IT reduces the search costs. So within a few seconds, customers can get detailed information about the products they need through the internet and find the best option.
- Farmani (2012) in a study titled “The relationship between Information Technology and Project Cost Management from the perspective of Sufian Cement Joint Stock Company”, which includes a main hypothesis and six sub-hypotheses. Statistical population of the study is all managers and supervisors of Cement Company and their number is 35. Sampling is done through census. Data collected from the questionnaire with 38 questions and 90% using Cronbach's Alfa coefficient. For data analysis, descriptive and inferential statistics (Pearson correlation coefficient) is used. The results show that the relationship between Information Technology and Project Cost Management is significant.
- Ala-addini and Daqayeqi (2008) in a study titled the results of application of COB IT reference model in evaluation of IT management processes at National Iranian Drilling Company by the process maturity approach confirmed the impact of IT on the intellectual attainment.
Methodology

In this study, considering the model of the Turny, main framework of Activity Based Costing is used (Rahnamay Roodposhti, 2009) which has a two dimension, Cost Assignment View and Process View. For IT operational model the four components of technology (ESCAP model- Technology Atlas) which includes Technoware, Humanware, and Info ware and Or aware are used. To universalize the model two dimensions of information literacy concept that are based on two universal standards of ICCS and ICDL were added. Considering that each user that each user needs information literacy to use Information Technology, operational model of the independent variable was presented as a combination of ESCALP technology components and international standards of ICDL and ICCS (Condition of facilities (Techno ware dimension), knowledge rate (Human ware dimension) usage rate (Info ware dimension), hardware agents (Or aware dimension), the ability to use Information Technology (ICCS International Certification), software agents of IT (ICDL International Certification).

The research model of this study is defined as $Y = \alpha X + \beta$. Y is the dependent variable (Activity Based Costing) and X is considered as independent variable (Information Technology), $\alpha$ as the slope and $\beta$ is defined as the intercept. In this study, researcher sought to find the rate of ($\beta$, $\alpha$) in order to find the correlation between the two variables of IT and ABC in the Khoy Telecommunications Company. The purpose of the present study is applied and its method is descriptive-survey. Findings of the applied research can be used to solve social problems. So, findings of this study can be used by other companies (Sarlik & Franny, 2008).

The statistical population of this study is employees of Khoy Telecommunications Company. According to Khoy Telecommunications Company the number of employees in this company is 68 so due to low population, total number of the employees considered as the statistical population and census method was used. In this study, to collect data and test the hypotheses a questionnaire with closed-ended questions was developed and presented which includes two sections. First section is based on the participants’ demographics (education, experience), and the second section is based on components related to variables of ICT and ABC. Participants respond to each question of questionnaire based on Likert scale. This means that participants should to response the questions using one of the options very high, high, medium, low and very low. Options were scored from 1 to 5. To determine the reliability and validity of data collection tools internal validity was used. So scholars and experts of the telecom company commented about the initial questionnaire that if it is valid or not and if the questions include what we consider or not. Then comments and required changes were applied in the questionnaire. To determine the reliability of questionnaire, Cronbach’s Alfa coefficient was calculated 0.89 to IT questions and 0.86 to ABC questions. These results indicate that firstly, questions are highly correlated with each other and secondly, the reliability of the questionnaire is high.

Time interval of this study was 7 months started from December 2011 and terminated on July 2012. In analyzing the collected data descriptive statistics was used to present the frequency, frequency percent and diagrams. Also inferential statistics (analysis of variance related to regression model) was used to indicate the presence or absence of a relationship between two variables.

Results

Before testing the hypotheses, first to check the normal distribution of variables, nonparametric test of Kolmogorov Smirnov was used that results showed IT variable (0.821) is at a significance level of 0.599, and ABC variable (0.709) is at a significance level of 0.696, which shows a normal distribution.

**The main hypotheses:** There is a relationship between Activity Based Costing and Information Technology in the Khoy Telecommunications Company.

<table>
<thead>
<tr>
<th>Number(N)</th>
<th>Variables</th>
<th>$R^2$</th>
<th>$\beta$</th>
<th>R</th>
<th>Confidence level</th>
<th>Sig.</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>IT &amp; ABC</td>
<td>0.18</td>
<td>0.15</td>
<td>0.39</td>
<td>0.95</td>
<td>0.000</td>
<td>2.221</td>
</tr>
</tbody>
</table>

Considering the results of the Table 1, the significance level of the test equals to 0.000 that is less than (0.05), therefore, it can be argued that the test is significant at confidence level of 95%.

**The first sub-hypothesis:** Information Technology affects Cost Assignment View of the Activity Based Costing in the Khoy Telecommunications Company.
**Table 2. Summarized Statistical Analysis of the first sub-hypothesis.**

<table>
<thead>
<tr>
<th>Number(N)</th>
<th>Variables</th>
<th>$R^2$</th>
<th>$\beta$</th>
<th>$R$</th>
<th>Confidence level</th>
<th>Sig.</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>IT &amp; CAV</td>
<td>0.24</td>
<td>0.12</td>
<td>0.35</td>
<td>0.95</td>
<td>0.000</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Considering the results of the Table 2, the significance level of the test equals to 0.000 that is less than (0.05), therefore, it can be argued that the test is significant at confidence level of 95%.

**The second sub-hypothesis:** Information Technology affects Process View of the Activity Based Costing in the Khoy Telecommunications Company.

**Table 3. Summarized Statistical Analysis of the second sub-hypothesis.**

<table>
<thead>
<tr>
<th>Number(N)</th>
<th>Variables</th>
<th>$R^2$</th>
<th>$\beta$</th>
<th>$R$</th>
<th>Confidence level</th>
<th>Sig.</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>IT &amp; PV</td>
<td>0.15</td>
<td>0.10</td>
<td>0.32</td>
<td>0.95</td>
<td>0.000</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Considering the results of the Table 3, the significance level of the test equals to 0.000 that is less than (0.05), therefore, it can be argued that the test is significant at confidence level of 95%.

**Discussion and Conclusion**

By the study of the main hypothesis (using regression analysis), which its significance level is at least smaller than 0.05, it can be concluded that, Information Technology has impact on the Activity Based Costing in Khoy Telecommunication Company. Considering the beta specification coefficient of 0.15, this relationship is positive and co-directed. It means more use of Information Technology, improves Activity Based Costing. Additionally, $R^2$ specification coefficient (the proportion of variations explained by the variable $X$ to the total variations) is 0.18. So it can be expressed that about 18% of variations of the dependent variable (Cost Assignment View, Process View) is justified by variations of the independent variable (Information Technology). Therefore, considering the specification coefficient of $\beta$ (0.15) this relationship is positive and co-directed.

According to this mathematical relationship IT impact on Activity Based Costing would be as follows:

$$Y = 2.221 X + 57.498$$

It can be expressed that in Khoy Telecommunications Company, when variable of Information Technology increases one unit it causes variable of Activity Based Costing to increase 2.221 units, and it can concluded that the regression model of this test is statistically significant and IT has impact on ABC and they have positive correlation with together.

In the study of first sub-hypothesis, considering the beta specification coefficient of 0.12, this relationship is positive and co-directed. It means more use of Information Technology, improves Cost Assignment View. Additionally, $R^2$ specification coefficient (proportion of variations explained by the variable $X$ to the total variations) is 0.24. So it can be expressed that about 24% of variations of the dependent variable (Cost Assignment View) is justified by variations of the independent variable (Information Technology). Therefore, considering the specification coefficient of $\beta$ (0.12) this relationship is positive and co-directed.

So, the regression model between IT (as the independent variable) and Cost Assignment View (as the dependent variable) in the Khoy Telecommunications Company will be as follows:

$$Y = 0.54 X_1 + 0.99$$

So it can be expressed that in Khoy Telecommunications Company, when variable of Information Technology increases one unit it causes variable of Cost Assignment View to increase 0.54, and it can concluded that the regression model of this test is statistically significant and IT has impact on CAV and they have positive correlation with together.

Based on the findings of the first sub-hypothesis (the impact of IT on Cost Assignment View), for optimal management of costs and cost allocation, information technology should be used more appropriately, and managers should use new accounting methods that are appropriate for Telecommunications Company and ICT services office to increase productivity and to reach to the optimal use of resources. In the study of second sub-hypothesis, considering the beta specification coefficient of 0.1, this relationship is positive and co-directed. It means more use of Information Technology, improves Process View. So the assumption $H_0$ (IT does not affect Process Approach in the Khoy Telecommunications Company) is rejected and the assumption $H_1$ is approved. Additionally, $R^2$ specification coefficient (proportion of variations explained by the variable $X$ to the total variations) is 0.15. So it
can be expressed that about 15% of variations of the dependent variable (Process View) is justified by variations of the independent variable (Information Technology). Therefore, considering the specification coefficient of $\beta$ (0.1) this relationship is positive and co-directed.

So, the regression model between IT (as the independent variable) and Process View (as the dependent variable) in the Khoy Telecommunications Company will be as follows:

$$Y = 0.46 X_2 + 1.33$$

So it can be expressed that in Khoy Telecommunications Company, when variable of Information Technology increases one unit it causes variable of Process View to increase 0.46, and it can be concluded the regression model of this test is statistically significant and IT has impact on PV and it have positive correlation with together. Based on the findings of the second sub-hypothesis (the impact of IT on Process View), for optimal management of Telecommunications Company and ICT service offices managers should use IT to improve internal processes of the organization and as a result to decrease the costs and increase the efficiency of company.

Suggestions

1. This research proposal should be examined separately for each organization and results that are obtained from different organizations should be compared.
2. In the future studies other known models should be used for evaluation of the status of the Activity Based Costing.
3. Managers should show interesting in learning of IT, and then they should encourage the staff. They should do most of their task using internet and computer.
4. Workshops and training classes about IT and Activity Based Costing should be held for managers and the staff to help them learn more about the correlation of the IT and ABC.

References


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