THE APPLICATION OF ACTIVITY-BASED COSTING AND ACTIVITY-BASED PLANNING INFLUENCES DECISION MAKING

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ABSTRACT

This study provides information on the efficiency of decision making based on accurate information through the use activity-based costing (ABC) and activity based planning (ABP). The results of this study provide additional insights for the management to adopt future strategic planning by controlling costs and invest in profitable projects. Furthermore, the results of the study will be helpful for all decision makers at all levels of the company. The findings of this study can contribute to the literature review.

Keywords: activity-based costing, activity-based planning, decision making, influence, oil companies, Yemen

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INTRODUCTION

Background of the Study

According to Dugdale (1990); Cooper and Kaplan (1992); Morgan (1993) and Cokins (1996) (as cited in Bengü, 2010), activity based costing system is used by many companies around the world as a tool for management planning, budgeting, and controlling. One of the new techniques and methods for making accurate decisions is controlling the cost by adopting activity-based costing and planning. Traditional cost system allocate overhead costs based on direct labour hours. Activity-based costing and planning not only focus to allocate overhead costs more accurately but also pinpoint areas of waste. Weygandt, Kimmel and Kieso (2012); Beheshti (2004); Sohal and Chung (1998) mentioned that he benefits of Activity-Based Costing system provides accurate information about product cost and leads to more cost activities.

Problem Statement

Traditional costing system is unable to achieve the managerial objective for decision making (Qasim, 2000). As the traditional costing system (process and job order costing) is unable to allocate the costs in an accurate manner, this may lead to a negative decision-making (Yousf & Auda, 2014). Traditional cost management systems; that is, the conventional cost accounting systems are often unable to identify correctly the true costs of processes (Chea, 2011). A firm with high levels of indirect overheads needs to use a sophisticated cost system to assign these costs to products rather than use the traditional cost system (Brierley, 2006).

Rickards (2006); Goode and Malik (2011); Sohal and Chung (1998) stated that traditional cost system has lost relevance with modern business environment, and does no longer satisfy the managers' need. According to Cooper and Kaplan (1988) (as cited in Ellis-Newman, 2003) product cost provided by ABC is more accurate than traditional cost methods because activities, not production volume cause costs to incur. Using activity-based costing can provide the necessary information for making critical/cost saving decisions (Beheshti, 2004).

A new system called activity-based costing was created as a response from companies who needed accurate information as opposed to lack of information from the tradition system (Ríos-Manríquez, Colomina & Pastor, 2014). Recently, activity-based costing and planning have been acknowledged as a superior tool for making strategic decisions and for improving profit performance (Taba, 2005). This study suggests that using Activity-based costing and Activity-based planning can lead to better and accurate decision making.

Research Objectives

There two main objectives of the study:

1. To examine the application of activity-based costing on decision making.
2. To examine the application of activity-based planning on decision making.

Research Questions

The study is about answering the following questions:

1. Does the application of activity-based costing influences decision making?
2. Does the application of activity-based planning influences decision making?

Research Hypothesis Development

The researcher developed two main hypotheses as follow:

1. $\mathbf{H_1}$: There is a positive influence of activity-based costing on decision making.
2. $\mathbf{H_2}$: There is a positive influence of activity-based planning on decision making.

This means that/In other words the use of ABC and P enhances the decision making roles, because it provides accurate information for decision makers regarding planning and budgeting.

Significance of the Study

This study will provide information about the efficiency of decision making on accurate information through the use of cost system especially activity based costing and planning. Hernon and Schwartz (2007) argued that the significance of any study must be able to answer "so what" question as well as "how so" question.

The study would also help the management to adopt future strategic planning because if the management is aware of where their money had gone and be able to trace it from the resource to the object (product/service), they will know how to control their cost and invest in profitable projects. Furthermore, this study will be helpful for all decision makers at all levels of the company. The findings of this study can be helpful specifically for the management of the company to adopt future strategic plan. This study will also add to the knowledge and literature review by examining the influence of activity-based costing and activity-based planning on decision making. Furthermore, it can provide insight for companies to understand the influence of activity-based costing and activity-based planning on decision making.

Scope of the Study

This study is limited to three variables, namely, activity-based costing (ABC), activity-based planning (ABP) and decision making to investigate if ABC and ABP have an influence on decision making in Oil companies in Yemen. This study is limited to two oil companies as they are the only companies use ABC and ABP; PetroMasila company (Block 14) and Canadian Nexen company (East Al Hajr - Block 51).

Operational Definition of Key Terms

For the academic purposes of the current study, the following operational definitions of terms obtained from the literature are used.

Activity-Based Costing

The system which allocates the overhead cost to multiple activity cost pools and assigns the activity cost pools to products or services by means of cost drivers that represent the activities used (Swan, 2002). Liggett, Trevino and Lavelle (1992, p. 4) argued that:

"Certain activities are carried out in the manufacture of products.

Those activities consume a firm's resources, thereby creating costs.

The products, in turn, consume activities. By determining the amount of resource (and the resulting cost) consumed by an activity and the amount of activity consumed in manufacturing a product, it is possible to directly trace manufacturing costs to products".

Activity-Based Planning

As stated by Brimson and Fraser (1991); Brimson and Antos (1994/1999); Sharman (1996); Kaplan and Cooper (1998) (as cited in Liu, Mitchell, & Robinson, 2008), one of activity-based costing management technique which has been heavily promoted in the professional journal literature is activity-based budgeting (ABB). Activity-based planning (ABP) is a process used by organizations to determine the activities and resources requirements (both financial and operational) based on the ongoing demand on products or services by specific customer needs. Then make activity-based budgeting based on the activity-based planning

Decision Making

The decision is a choice made to choose one alternative among more available alternatives. Certo and Certo (2012) mentioned that decision making is a process of choosing the best alternative from other alternatives in order to reach an objective. Wood et al. (2004) defined decision making as a process taken to identify a problem or opportunity and choosing among all the alternatives the best alternative.

LITERATURE REVIEW

Previous Studies of Activity-Based Costing (ABC), Activity-Based Planning (ABP) and Decision Making (DM)

Ogoun (2013) stated that, ABC will lead to more than effective and efficient tactical decisions. Chea (2011) argued that, using ABC improve managerial decision making, as well as ABC can be used as a tool for

determining costs and help firms make better decisions based on more accurate costing information. While Radi and Ismail (2011) stated that ABC system is more accurate and fair in allocating costs which enhance management decision, Aho (2006) argued that activity-based costing can be used as a base for process improvement decisions and provide useful information into product design decisions. Cohen (2004) said that ABC helps managers make better decisions and encourage continual improvement, and provides accurate information than traditional costing. Furthermore, ABC method has contributed effectively to the top management's decision-making process.

Liu, Mitchell and Robinson (2008) said that one of the positive aspects of ABP is that area managers have started to make internal decisions differently. Liu (2006) concluded that activity-based planning a tool for making better strategic decision and improve performance. Moreover, Coenen and Van (2009) mentioned that activity-based planning enhances decision making and ABC has absolute decision, power and influence. Shane (2005) stated that budgets reflect the relative proportion of decisions made for local and constituency purpose. Neely, Sutcliff and Heyns (2001) mentioned that ABP helps in providing relevant information for decision making.

Activity-based Costing and Activity-based Planning and Decision Making

In the past, business environment is not as complex as today. For example, organization was producing simple product which means they can know which product or service is more profitable. However with the revolution of technology and the complexity of business environment, it is becoming difficult to know the accurate cost of product/service due to the increase of the percentage of overheads compared to material and labour costs.

Decision makers cannot make accurate decision based on inaccurate information. Due to the deficiencies in traditional costing system, in 1980 Cooper Robin invented a new system called activity based costing and some manufacture adopted this system to provide them accurate information about the cost of product/service and to make accurate decision. The

effects of decision can be evaluated in many ways such as effectiveness improvement, efficiency improvement, productivity improvement, and process improvement (Van Damme & Van Der Zon, 1999).

Theory of the Study

Gorbunova and Moisello (2008) stated that the theory of ABC regarding the allocation of costs starts from the assumption that the production and transfer of output to the market requires activities related with that transactions within organizations, which in turn leads to the incurring of costs. Cho and Boulianne (2005); Jinks (2012) stated that the theory behind activity-based costing is that all activities to support the production and delivery of a company's goods must be taken into account in the product costing process.

Research Framework / Theoretical Framework

After careful consideration of the research questions and objectives of this study and review of relevant literature,, the theoretical framework and research mode is developed and hypothesis are formulated to identify the influence of independent variables (ABC and ABP) on the dependent variable (Decision Making). Figure 1 illustrates the study variables. Based on the literature review presented earlier, certain investigations are accomplished to examine the influence of independent variables on dependent variable.

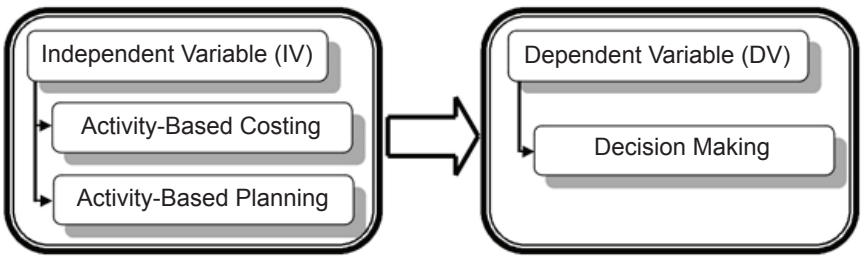

Figure 1: Theoretical Framework

RESEARCH METHODOLOGY

Research Design

This research was attempted to explore the influence of two independent variables (ABC & ABP) on the dependent variable (decision making). The research design includes the analysis unit, research location, population, sampling technique, measurements and instruments of independent and dependent variables, data collection method, questionnaire design, data collection and data analysis. The research method is a quantitative study. The questionnaire will be submitted to finance staff, ABC & P users and decision makers.

Unit of Analysis

The unit of analysis of this research is finance staff, users of ABC and ABP, and decision makers working in PetroMasila and Nexen.

Sources of Data

The primary source of data is collected through a self-administered questionnaire. Secondary data such as articles, magazine, thesis, books, and internet are used to support the research.

Research Location

The location of this research is finance, operations department and decision makers in oil companies in Yemen that use ABC and ABP system, especially PetroMasila and Nexen.

Population

According to Wilkinson (1999, p.595) "The interpretation of the results of any study depends on the characteristics of the population intended for analysis". The study was conducted in Oil companies in Yemen. The population of this study were employees of two oil companies; PetroMasila and Nexen.

Sample

The sample covered all the population which consisted of finance staffs, the users of ABC and ABP and decision makers in PetroMasila and Nexen. The data was collected through questionnaires and the questions were close ended questions. Sixty questionnaires were distributed to different target samples and a time of two weeks were given for the responds to answer the questionnaires. Out of the 60 questionnaires, only 54 questionnaires were returned and 49 were valid for analysis. Although the sample size was small, there were no other oil companies in Yemen using ABC and ABP other than PetroMasila and Nexen.

Measurement

The decision making was measured in terms of good performance, cost reduction and enhancement, cost allocation, budget control, and improvement of financial situation. Activity-based costing and planning as the independent variables are assessed by providing accurate information (output) and control tool. There are 11 items for decision making dependent variable, 10 items for activity-based costing and 11 items for activity-based planning as shown in Table 1.

Table 1: Study's Variables Questionnaire's Items

Variable	Total No. of Items	Scale
Decision Making	11	5. point Likert Scale
Activity-Based Costing	10	5. point Likert Scale
Activity-Based Planning	11	5. point Likert Scale

Inferential Statistics

Inferential statistics are used to make inferences about a whole population from a sample (Zikmund & Babin, 2010; Sekaran & Bougie, 2010). Inferential analysis includes multiple regression analysis.

Multiple Regressions

Multiple regression analysis is used to predict the dependent variable by relying on its covariance with all other related independent variables of the study (Kothari, 2004). The analysis shows the influence of independent

variables on the dependent variable and specifies which independent variables have the most influence on the dependent variable.

Multiple regressions are intended to show the significant relationship between independent variables and the dependent variable.

RESULTS AND FINDINGS

Descriptive Analysis

Normal Distribution of Data

The data of the research is perfectly distributed as indicated in the normal P-P Plot Figure 2 and scatterplot Figure 3 and histogram Figure 4.

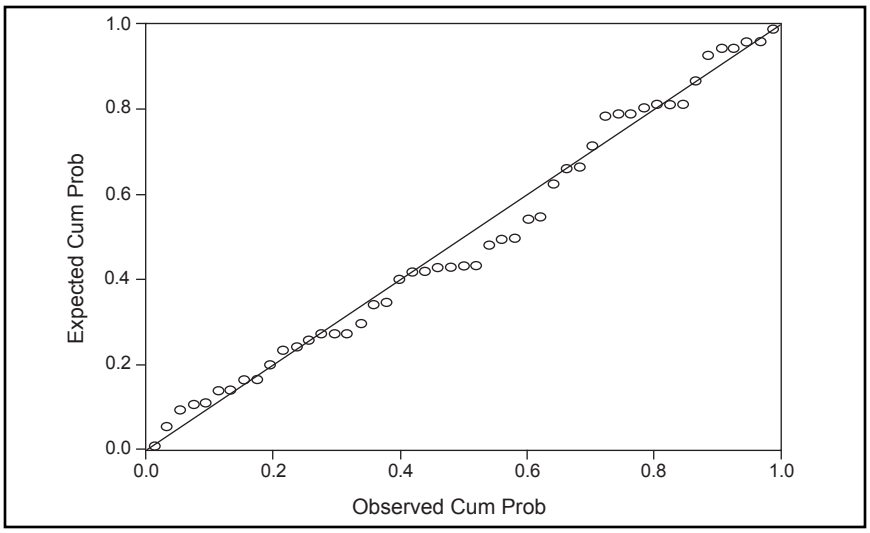

Figure 2: Normal P-P Plot of Regression Standardized Residual Dependent Variable

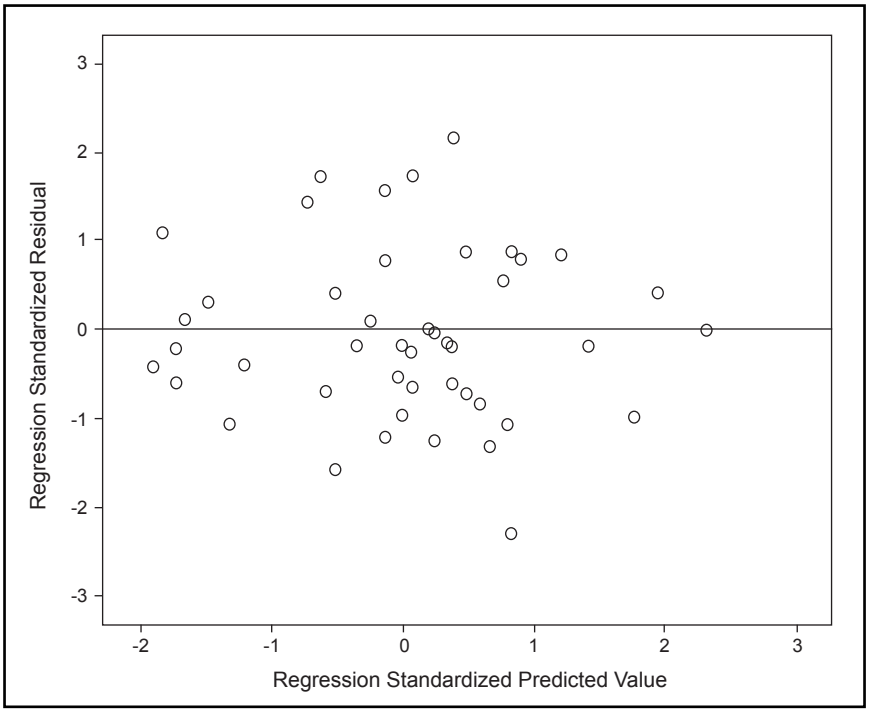

Figure 3: Scatterplot Dependent Variable: Decision Making

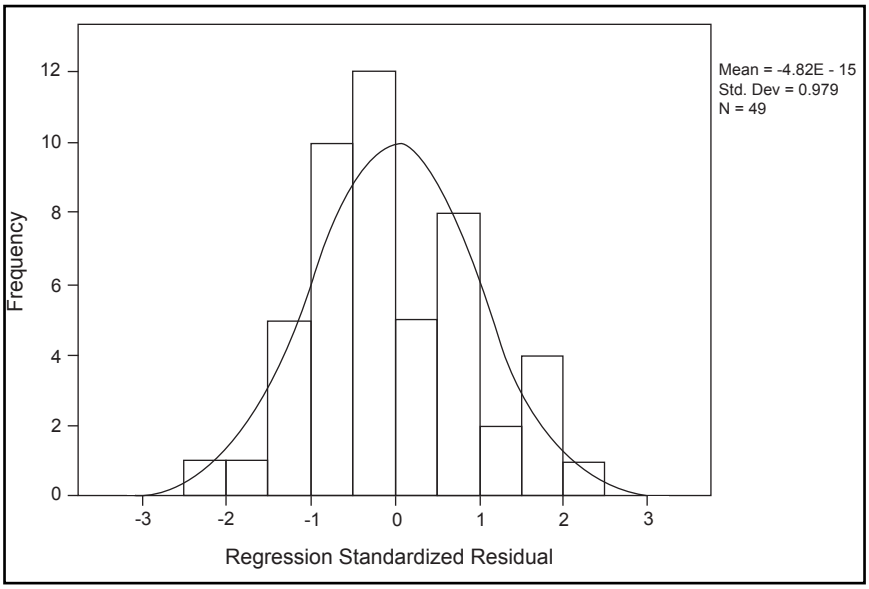

Figure 4: Histogram Dependent Variable: Decision Making

Variable Characteristics

Below are the analysis of the items for the three variables, dependent variable (Decision Making), and independent variables (Activity-Based Costing & Activity-Based Planning).

For each item, the following information will be illustrated: "N" value: number of respondents for the item; "Mean": the mean of the item which will be out of "5"; "Standard deviation": Std. Dev. value for the item; "Min" & "Max" value: which within the range 1~5; and frequencies for each item will be illustrated.

Decision making

Table 2 illustrates the characteristics of dependent variable.

Table 2: Decision Making – Dependent Variable (Mean 4.039: Std Dev. 0.34167)

		Descriptive					Frequencies				
#	Questionnaire Items	N	Mean	Std De.	Min	Max	Strong. Disagree	Disagree	Don't know	Agree	Strongly agree
	Section A-						0	0	3	24	22
1	01: (DM-DV) Section A-	49	4.39	.606	3	5	0	0	6.1%	49%	44.9%
2	02: (DM-DV) Section A-	49	4.49	.505	4	5	0	0	0	25	24
							0	0	0	51%	49%
							0	1	3	26	19
3	03: (DM-DV) Section A-	49	4.29	.677	2	5	0	2%	6.1%	53.1%	38.8%
							0	1	1	34	13
4	04: (DM-DV) Section A-	49	4.20	.577	2	5	0	2%	2%	69.4%	26.5%
							0	8	3	30	8
5	05: (DM-DV) Section A-	49	3.78	.919	2	5	0	16.3%	6.1%	61.2%	16.3%
							11	31	1	6	0
6	06: (DM-DV) Section A-	49	2.04	.865	1	4	22.4%	63.3%	2%	12.2%	0
							0	1	4	26	18
7	07: (DM-DV) Section A-	49	4.24	.693	2	5	0	2%	8.2%	53.1%	36.7%
							0	1	0	27	21

8	08: (DM-DV) Section A-	49	4.39	.606	2	5	0	2%	0	55.1%	42.9%
							1	0	6	24	18
9	09: (DM-DV) Section A-	49	4.18	.808	1	5	2%	0	12.2%	49%	36.7%
							0	0	3	29	17
10	10: (DM-DV) Section A-	49	4.29	.577	3	5	0	0	6.1%	59.2%	34.7%
						5	0	3	1	31	14
11	11: (DM-DV)	49	4.14	.736	2			6.1%	2%	63.3%	28.6%

Exploring the above statistics, from item one to five, "agree" and "strongly agree" have the highest value, whereas item six "disagree" was the highest. For item seven to eleven, "agree" and "strongly agree" have the highest value. Looking at the mean, most of the items are above "4" scale except item five and six, where the "mean" for the all is 4.039 which seems very good.

With regard to the first item of the questionnaire, "Managers make better decision by using activity-based costing and activity-based planning", the mean is 4.39, which means that the respondents are very satisfied with the item, and they agree that using activity-based costing and activity-based planning lead to making better decisions. Regarding item two, "One of the main purposes of Activity-based costing and planning in the organization is decision making", the mean is 4.49, which means that the respondents are very satisfied with the item.

The respondents agree that activity-based costing and activity-based planning were used for decision making. The third item "Senior manager believe that activity-based costing and activity-based planning help for DM" has a mean 4.29 which indicates that the respondents are very satisfied with the item. Respondents agree that senior management believes that activity-based costing and activity-based planning had helped in decision-making. The fourth item "The decision is going to be difficult and more complicated if there is no Activity-based costing and planning" has a mean 4.20 which states that the respondents are very satisfied with the item, so they agree that decision making will be difficult if there were no activity-based costing and activity-based planning.

The fifth item, "Most of decisions are taken based on Activity-based costing and planning output" has a mean 3.78 which means that the respondents are satisfied with the item. Respondents agree that most of the decisions in the studied companies relied on activity-based costing and activity-based planning. The sixth item, "Most of decisions are taken randomly without using Activity-based costing and planning reports" has a mean 2.04 which means that the respondents disagree with the item and they believe that no decisions were taken randomly.

The seventh item, "Accurate information can be generated by ABC for decision making" has a mean 4.24 which means that the respondents are very satisfied with the item. The respondents agree that activity-based costing yield accurate information for decision-making purpose. Item number eight, "the decisions which related with budget preparation become more accurate" has a mean 4.39 which means that the respondents are very satisfied with the item. As the budget prepared were based on activities, the respondents agree that all decision related to budget are more accurate.

The ninth item, "Planning Supervisors share the information of ABC and ABP with all decision makers", has a mean 4.18 which means that the respondents are very satisfied with the item and they agree that planning supervisors shared the information of activity-based costing and activity-based planning with all decision makers.

The tenth item, "Planning and budgeting estimation decisions have been enhanced using ABC & ABP", has a mean 4.29 which means that the respondents are very satisfied with the item. They agree that activity-based costing and activity-based planning enhanced the estimation and preparation of the budget. Item number eleventh, "operation management areas decision improved using ABC & ABP" has a mean 4.14 which means that the respondents are very satisfied with the item and agree that the decisions in operations management improved after using activity-based costing and activity-based planning.

Activity-Based costing

Table 3 illustrates the characteristics of independent variable.

Table 3: Activity-Based Costing – Independent Variable (Mean 4.016 Std Dev. 0.40638)

#	Questionnaire Items	Descriptive					Frequencies				
		N	Mean	Std De.	Min	Max	Strong. Disagree	Disagree	Don't know	Agree	Strongly agree
	Section B-						0	2	5	35	7
1	01: (ABC- IV) Section B-	49	3.96	.644	2	5	0	4.1%	10.2%	71.4%	14.3%
							0	1	0	39	9
2	02: (ABC-IV) Section B-	49	4.14	.500	2	5	0	2%	0	79.6%	18.4%
							0	2	7	32	8
3	03: (ABC-IV) Section B-	49	3.94	.689	2	5	0	4.1%	14.3%	65.3%	16.3%
							0	4	3	27	15
4	04: (ABC-IV) Section B-	49	4.08	.838	2	5	0	8.2%	6.1%	55.1%	30.6%
							0	9	7	28	5
5	05: (ABC-IV) Section B-	49	3.59	.911	2	5	0	18.4%	14.3%	57.1%	10.2%
							0	0	7	33	9
6	06: (ABC-IV) Section B-	49	4.04	.576	3	5	0	0	14.3%	67.3%	18.4%
							0	2	1	34	12
7	07: (ABC-IV) Section B-	49	4.14	.645	2	5	0	4.1%	2%	69.4%	24.5%
							0	3	3	33	10
8	08: (ABC-IV) Section B-	49	4.02	.721	2	5	0	6.1%	6.1%	67.3%	20.4%
							0	0	2	29	18
9	09: (ABC-IV) Section B-	49	4.33	.555	3	5	0	0	4.1%	59.2%	36.7%
							0	2	6	35	6
10	10: (ABC-IV)	49	3.92	.640	2	5	0	4.1%	12.2%	71.4%	12.2%

Reviewing the above statistics, in all the ten items both choice "agree" and "strongly agree" have the highest value. Most of "mean" values were above "4" scale, and the "mean" for the all were 4.016 which seems very good. For the first item of the questionnaire, "The company share the knowledge about Activity-based costing", the mean is 3.96 which means that the respondents are satisfied with the item, and they agree that the

company shared the knowledge about ABC. Regarding item two, "I fully understand the general use and benefit of Activity-based costing" the mean is 4.14 which means that the respondents are very satisfied with the item and they fully understand the general use and benefit of ABC.

The third item, "After applying Activity Based Costing the cost is reduce, firm's profit has increased" has a mean 3.94 which indicates that the respondents are satisfied with the item which means using ABC system in the company has led to reduction in the cost and increased in the profit. The fourth item "All activities are clear and well categorized in the organization" has a mean 4.08 which states that the respondents are satisfied with the item, and they agree that the activities are clear and well categorized. The fifth item, "There is a well programmed Activity-based costing software yield accurate output for decision making", has a mean 3.59 which means that the respondents are satisfied with the item, and they are satisfied with the ABC software.

The sixth item, "The financial situation has been improved by using Activity-based costing" has a mean 4.04 which means that the respondents are satisfied with the item, meaning that the respondents believes that the financial situation has improved after using ABC. The seventh item, "Activity-based costing provides a control over the overhead costs", has a mean 4.14 which means that the respondents are very satisfied with the item, their responds are parallel with many findings and studies which proves that ABC control overhead costs.

Item number eight, "I'm satisfied with the exiting Activity-based costing as costing system", has a mean 4.02 which means that the respondents are satisfied with the item and they are satisfied with the current ABC system. The ninth item, "Using activity based costing reduces un-necessary costs" has a mean 4.33 which means that the respondents are very satisfied with the item and most of them agree that ABC reduced un-necessary costs. The tenth item, "All the input data for Activity-based costing received correctly from other sections" has a mean 3.92 which means that the respondents are satisfied with the item and they are satisfied with the input data for the system.

Activity-Based planning

Table 4 illustrates the characteristics of independent variable – activity-based planning.

Table 4: Activity-Based Planning – Independent Variable (Mean 4.080: Std Dev. 0.42301)

#	Questionnaire Items	Descriptive					Strong. Disagree	Disagree	Frequencies		
		N	Mean	Std De.	Min	Max			Don't know	Agree	Strongly agree
	Section C-						0	5	0	31	13
1	01: (ABP-IV) Section C-	49	4.06	.827	2	5	0	10.2%	0	63.3%	26.5%
							0	4	0	28	17
2	02: (ABP-IV) Section C-	49	4.18	.808	2	5	0	8.2%	0	57.1%	34.7%
							0	0	0	34	15
3	03: (ABP-IV) Section C-	49	4.31	.466	4	5	0	0	0	69.4%	30.6%
							0	2	1	32	14
4	04: (ABP-IV) Section C-	49	4.18	.667	2	5	0	4.1%	2%	65.3%	28.6%
							0	0	4	35	10
5	05: (ABP-IV) Section C-	49	4.12	.526	3	5	0	0	8.2%	71.4%	20.4%
							0	0	6	33	10
6	06: (ABP-IV) Section C-	49	4.08	.571	3	5	0	0	12.2%	67.3%	20.4%
							0	0	3	35	11
7	07: (ABP-IV) Section C-	49	4.16	.514	3	5	0	0	6.1%	71.4%	22.4%
							0	6	7	28	8
8	08: (ABP-IV) Section C-	49	3.78	.872	2	5	0	12.2%	14.3%	57.1%	16.3%
							0	0	3	35	11
9	09: (ABP-IV) Section C-	49	4.16	.514	3	5	0	0	6.1%	71.4%	22.4%
							0	3	5	29	12
10	10: (ABP-IV)	49	4.02	.777	2	5	0	6.1%	10.2%	59.2%	24.5%

Illustrating the above statistics, in all the eleven items both choices "agree" and "strongly agree" have the highest value. Most of "mean" values are above "4" scale, and the "mean" for the all are 4.080 which seems very good. For the first item of the questionnaire, "I usually receive feedback from finance supervisor (planning) regarding Activity-based

planning" the mean is 4.06 which means that the respondents are satisfied with the item and they agree that they received feedback from finance - planning - supervisor regarding activity-based planning. Regarding item two, "Activity-based planning system provides accurate information about cost of product/service" the mean is 4.18 which means that the respondents are very satisfied with the item.

The respondents prove that activity-based planning system provides accurate information about cost of product / service. The third item, "Activity-based planning system is a good tool to control the comprehensive budget", has a mean 4.31 which indicates that the respondents are very satisfied with the item and they agree that activity-based planning is considered as a good tool to control the comprehensive budget. The fourth item, "Activity-based planning provides a control over the overhead costs" has a mean 4.18 which states that the respondents are very satisfied with the item and they totally agree that activity-based planning provides control over overhead costs.

The fifth item. "The organization has a clear policy regarding the practice of Activity-based planning", has a mean 4.12 which means that the respondents are very satisfied with the item and agree that the organization has a clear policy regarding the practice of activity-based planning. The sixth item, "All activities are clear and well categorized in the organization" has a mean 4.08 which means that the respondents are satisfied with the item and agree that all activities are clear and well categorized in the organization.

The seventh item "The analysis of the activities and estimated cost performed in appropriate manner" has a mean 4.16 which means that the respondents are very satisfied and agree with the item. Item number eight, "There is a well programmed Activity-based planning software yield accurate output for decision making" has a mean 3.78 which means that the respondents are satisfied and agree with the item. The ninth item, "The financial situation has been improved by using Activity-based planning" has a mean 4.16 which means that the respondents are very satisfied with the item and agree that using activity-based planning improved the financial situation.

The tenth item, "I'm satisfied with the exiting Activity-based planning as costing system" has a mean 4.02 which means that the respondents are satisfied and agree with the item. Item number eleventh, "All the input data for Activity-based planning received correctly from other sections" has a mean 3.82 which means that the respondents are satisfied and agree with the item.

Skewness and Kurtosis

To test the normality of the study's data, the researcher will implement skewness and kurtosis test. Alderson & Bachman (2004) outlined that value for skewness and kurtosis can be positive and negative, or zero. Zero result indicates a perfectly symmetrical distribution. He added that values for skewness and kurtosis of between -2 and +2 indicate a reasonably normal distribution if the value about -2 and +2 can be about 95% confident that the distribution is normal. Furthermore, George and Mallery (2010) stated that the values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal distribution.

The Skewness value for decision making is -0.021; for activity-based costing 0.104 and for the activity-based planning -0.010. These values are between -2 & +2 which indicate that the data is normal and reliable (George & Mallery, 2010; Alderson & Bachman, 2004). On the other hand, it is noted that the Kurtosis value for decision making is -0.902; and -0.132 for activity-based costing while -0.207 for activity-based planning. These values also indicate that data is normal which ranges between -2 & +2 (Alderson & Bachman, 2004). Table 5 shows these values accordingly.

Table 5: Skewness and Kurtosis

	Skewness		Kurtosis	
	Statistic	**Std. Error**	**Statistic**	**Std. Error**
Decision Making - DV	-.021	.340	-.902	.668
Activity-Based Costing - IV	.104	.340	-.132	.668
Activity-Based Planning - IV	-.010	.340	-.207	.668
Valid N (listwise)				
- Reliability Test				

Reliability Test

Saunders, Lewis and Thornhill (2009) stated that using reliability test to test the stability and consistency of measures that measures the instruments helps to assess the goodness of a measure. Cronbach's alpha coefficient was implemented to test the reliability of this study

Cronbach's Alpha Coefficient (α)

These results obtained from performing the reliability analysis as shown in Table 6.

Table 6: Reliability Analysis of the Study's Instruments

Description of Variable	Number of Items	Cronbach's Alpha Coefficient (α)
Decision Making = Dependent variable	11	0.681
Activity-Based Costing = Independent variable	10	0.798
Activity-Based Planning = Independent variable	11	0.845
For all variables (DV&IV)	32	0.911

The results of Cronbach's (α) alpha reliability coefficients of the dependent variable over 0.60 ranges, as well as the results for the independents variables above 0.70, So, based on the obtained result, the internal consistency reliability of the measure used in this study can be considered acceptable according to Cronbach's (α) alpha standard as mentioned by Sekaran and Bougie (2010).

Variance Inflation Factor VIF (Multicollinearity)

One of the results shown on Table 7 is Collinearity Statistics which tests the Collinearity by variance inflation factor VIF and tolerance. Hair et al. (2009) recommend that a very small tolerance value (0.10 or below) or a large VIF value (10 or above) indicates high collinearity. Also according to Ye (2007), Zikmund et al. (2013) VIF value (less than) <5.0 consider an acceptable value. The result of the study shows VIF value 2.388 and tolerance 0.419 which consider an acceptable value and no multicollinearity problem can be expected.

Table 7: Variance Inflation Factor

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Activity-Based Costing - IV	.419	2.388
	Activity-Based Planning - IV	.419	2.388

a. Dependent Variable: Decision Making - DV

FINDINGS

Model Summary – R square

After reviewing Coefficients analysis, next model summary will be explained. Table 8 show the model summary for multiple regressions:

Table 8: Model Summary

Model		R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Chang Square	F Change	df 1	df 2	Sig. F Change	Durbin - Watson
1	.759[a]	.576	.557	.22731	.576	31.224	2	46	.000	2.064

a. Predictors: (Constant), Activity-Based Planning - IV, Activity-Based Costing – IV
b. Dependent Variable: Decision Making - DV

The square of multiple r, R-square or R2 as it is commonly known, is the amount of variance explained in the dependent variable by the independent variables (Sekaran & Bougie, 2010). The above results show that "R" value 0.759 and "R square" value 0.576 "F" value 31.224 significance level of $p < .001$ which mean only 57.6% of the variance in decision making has been significantly explained by the two independent variables (predictors) considered in this study and 42.4% unexplained. In other words, there are other additional variables that are important in explaining decision making that have not been considered in this study. The value of the adjusted R-square in this study is .557 and this suggests that the predictors of this study are fitting strongly at predicting the criterion, namely, decision making based on Muijs (2004) suggestion.

Durbin-Watson test result was used to detect the level of autocorrelation between errors. Saunders et al. (2009) and Ibodullayevna (2011) stated that Durbin-Watson statistic ranges in value from zero to four. The result of Durbin-Watson was 2.064 which is a value close to the integer value of "2" this is mean that the independent variables (Activity-Based Costing and Activity-Based Planning) and dependent variable, namely, Decision making, are significant and there is a non-value for the autocorrelation.

ANOVA Analysis

Table 9: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.227	2	1.613	31.224	.000[b]
	Residual	2.377	46	.052		
	Total	5.603	48			

a. Dependent Variable: Decision Making - DV
b. Predictors: (Constant), Activity-Based Planning - IV, Activity-Based Costing - IV

The outputs of Table 9 show that the "F" ratio value of 31.224 with 2 and 46 degrees of freedom (df) and has a probability of occurrence by chance alone of less than 0.001. So the independent variables explain a large portion of the variance in the dependent variable. Therefore, a significant relationship was present between Decision Making and Activity-Based Costing, and Activity-Based Planning.

Hypotheses Testing

Multiple regressions will be used to examine the influence of independence variables on a single, interval or ratio-scaled dependent variable. The test will treat the influence of independent variables on the dependent variable.

The multiple regression equation is:

$$Y'i = a + \beta 1X1 + \beta 2X2 + \beta 3X3 \ldots + \beta nXn$$

Or, in some references, they add the error term as follow:

$$Y'i = a + \beta 1X1 + \beta 2X2 + \beta 3X3 \ldots + \beta nXn + \varepsilon$$

Where is:

Y'i = Dependent Variable a = A constant (intercept),

X1 X2... Xn = Predictor variables

β 1 = Coefficient on the first predictor variable

β 2 = Coefficient on the second predictor variable, and so on

ε = The error term or the residual that cannot be explained by the model.

The model of this study can be as follow:

$$DM = a + \beta 1ABC + \beta 2ABP + \varepsilon$$

Saunders et al. (2009) argued that a very low significance value (usually less than 0.05) means that the coefficient is unlikely to have occurred by chance alone while a value greater than 0.05 means that the coefficient of multiple regression could have occurred by chance alone. Similarly, according to Hair et al. (2009) the most wildly used level is the 95% confidence with significance interval (a=.05), standard error of the estimate ±1.96,

The multiple regression analysis (coefficient of multiple determinations) shown in Table 10 suggests that the predictors (i.e., Activity-based costing and Activity-based planning) are significantly and positively influence the criterion known as the decision making or the dependent variable.

Table 10: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	Beta		
1	(Constant)	1.356	.343		3.954	.000
	Activity-Based Costing - IV	.270	.125	.322	2.167	.035
	Activity-Based Planning - IV	.391	.120	.485	3.266	.002

a. Dependent Variable: Decision Making – DV

According to Zikmund, Babin, Carr and Griffin (2013) the "β" coefficient should be within range ±1. Table 4.6 shows that "β" and for constant, activity-based costing, and activity-based planning is 1.356, 0.270, & 0.391 respectively. Also, the sig. value for activity-based costing, and activity-based planning is 0.035 and 0.002 (all less than 0.05). So the β value for the two independent variables were beyond the range that β should theoretically take.

Based on the above regression's result, it is clearly indicated that there is a positive influence of activity-based planning on decision making. Therefore, H1 has been accepted. Activity-based planning has the most influence on the dependent variable, namely, decision making with β and P Beta value of (3.266), (0.002) and (0.485) respectively (a p-value ≤.05 at a 95 % confidence level) indicating that ABP has a positive and significant influence on DM. Therefore, H2 has been accepted.

Also, based on the above regression's result, it clearly indicates that there is a positive influence of activity-based costing on decision making. Activity-based costing has an influence on the dependent variable, namely, decision making with β and P Beta value of (2.167), (0.035) and (0.322) respectively (a p-value ≤.05 at a 95 % confidence level) indicating that ABC has a positive and significant influence on DM.

Significance of ABC & ABP are 0.035 and 0.002 respectively, which means the probability of these results occurring by chance is less than 0.05. This means that the regression coefficients for these variables are both statistically significant at the p-value ≤.05.

Study model will be as follow:

$$DM = 1.356 + 0.270ABC + 0.391ABP + \varepsilon$$

DISCUSSION AND CONCLUSION

Summarizing the Findings

The outcomes of the data collected through the questionnaire provide an answer for each question. The findings reveal that ABC and ABP have a positive influence on the decision making. Meaning that companies which use ABC and ABP system make accurate decision compare to other companies as perceived by decision makers, users of ABC and ABP, and finance staff (questionnaire respondents) (See Appendix A). Furthermore, the findings of this study can be considered as a contribution to literature review.

Discussion of the Findings

As this study tries to address the issue of decision making, the first objective was to examine the influence of ABC on decision making. Thus, the hypothesize was that there is a positive influence of ABC on DM. The result of this study showed that there is a positive and significant influence of ABC on DM. This result is in line with Ogoun (2013); Radi and Ismail (2011); Chea (2011); Aho (2006); Skaik (2006); Cho and Boulianne (2005); Beheshti (2004); Cohen (2004); Ellis-Newman (2003); Swan (2002) and Gurse (1999) who found that activity based costing has a positive relationship with decision making, and is considered as one the main tools used for making decisions and provide accurate information about product / service costs.

The second objective was to examine the influence of ABP on decision making. Thus, the hypothesize was that there is a positive influence of ABP on DM. The results of this study showed that there is a positive and significant influence of ABP on DM as hypothesizes. This result is in line with several other studies (Bengü 2010; Coenen & Van, 2009; Liu, Mitchell, & Robinson, 2008; Liu 2006; Shane, 2005; Cohen, 2004; Neely et al., 2001; Réka, Ştefan, & Daniel, 2014) All these studies showed that activity

based planning has a positive relationship with decision making, and it is considered as one the main tools used for making decisions and provide accurate information about product / service costs.

Implications

Knowledge of activity-based costing and activity-based planning and its influence on decision making can help the organization to make accurate and meaningful decisions. Activity-based costing and activity-based planning can be a good tool for performance enhancement, profit increase, and cost enhancement. Even though there is a limitation of using activity-based costing but there a bright side and excellent instrument of using activity-based costing, so management has to see the advantages of activity-based costing and activity-based planning.

Activity-based costing and activity-based planning system consider a costly system, so the implementation of the system should be monitored perfectly by management.

Limitation of the Study

The limitation of this study can summarized as follow:

Within the confines of the researcher's knowledge, this research is directed at finding the influence of activity-based costing and activity-based planning on decision making a research has been conducted on oil companies that implement activity-based costing and activity-based planning in Yemen (Nexen & Petro Masila). As this objective of this research was to investigate the influence of activity-based costing and activity-based planning on decision making, it therefore did not explore the implementation of the system.

Additionally, the questionnaire targeted specific staff such as finance staff, decision makers and users of activity-based costing and activity-based planning system. As such, the sample size is limited as only two oil companies in Yemen implemented the system. The sample size was based on Krejcie and Morgan (1970) sample size. This limitation may restrict the generalizability of the findings. The questionnaire method also has its own

limitations. As the questionnaire was based on close ended questions, the respondents' response may be limited.

The last significant limitation was the lack of literature review on the influence of activity-based costing and activity-based planning on decision making concerning Yemen as a Third World country. This has led the researcher to depend on only regional and foreign studies on the topic.

Recommendations and Directions for Future Research

Based on the findings of this research it is recommended that oil companies use activity-based costing and activity-based planning to allocate overhead costs because these methods can overcome many deficiencies in traditional costing system by providing accurate information in making rational decisions. The findings of this research can serve as guideline for future researchers who are interested in examining the influence of activity-based costing and activity-based planning on decision making.

Future researches could implement the influence of activity-based costing and activity-based planning on decision making in different sector(s) in order to find out if there are differences in the findings. Moreover, it is beneficial for additional future researches to tackle the influence that activity-based costing and activity-based planning have on different managerial issues besides decision making. For example, the influence of activity-based costing and activity-based planning as independent variables and other dependent variable such as strategic planning.

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APPENDIX A

Survey – Questionnaire

Please indicate the extent to which you agree or disagree with the following statements by putting (√) in the appropriate box. Results will be grouped, and all individual comments will be kept anonymous.

Respondents of this questionnaire are decision makers, finance staff, and the users of activity-based costing and activity-based planning system.

01- Kindly provide the following information about yourself:

1.	Age:	Less than 35 years	☐	(35-45) years old	☐
		(Over 45) years	☐		
2.	Gender:	Male	☐	Female	☐
3.	Education Level:	Primary	☐	Secondary School	☐
		Diploma Post Grad.	☐	Bachelor	☐
4.	Major:	Accounting	☐	Business Administration	☐
		Economic	☐	Other	☐
5.	* Position Level:	Senior Level	☐	Middle Level	☐
		Operational Level	☐	Employee	☐
6.	Decision Maker:	Yes	☐	No	☐
7.	Use of ABC&P:	Key user	☐	End user	☐
		Don't use	☐		
8.	Experience in Accounting:	Less than 5 yrs	☐	5~10 yrs	☐
		Over 10 yrs	☐		
9.	Experience in Costing:	Less than 5 yrs	☐	5~10 yrs	☐
		Over 10 yrs	☐		

Position Level:
- Senior level: Senior management.
- Middle level: Department Managers.
- Operational level: Superintendent / Supervisors.
- Employee: any one not included above.

Section A:

Decision Making DM: (Dependent variable)

Decision making is the process of choosing the best alternative from more alternatives for reaching objective.

#	Statement	Strongly Disagree (1)	Disagree (2)	Don't Know (3)	Agree (4)	Strongly Agree (5)
01	Managers make better decision by using activity-based costing and activity-based planning.					
02	One of the main purpose of Activity-based costing and planning in the organization is decision making					
03	Senior manager believe that activity-based costing and activity-based planning help for DM					
04	The decision is going to be difficult and more complicated if there is no Activity-based costing and planning.					
05	Most of decisions are taken based on Activity-based costing and planning output.					
06	Most of decisions are taken randomly without using Activity-based costing and planning reports.					
07	Accurate information can be generated by ABC for decision making					
08	The decisions which related with budget preparation become more accurate.					
09	Planning Supervisors share the information of ABC & ABP with all decision makers.					
10	Planning and budgeting estimation decisions have been enhanced using ABC & ABP.					
11	Operation management areas decision improved using ABC & ABP.					

APPENDIX B

Statistical Reports for Analysis Using SPSS

	Section A-01: (DM-DV)	Section A-02: (DM-DV)	Section A-03: (DM-DV)	Section A-04: (DM-DV)	Section A-05: (DM-DV)	Section A-06: (DM-DV)	Section A-07: (DM-DV)	Section A-08: (DM-DV)	Section A-09: (DM-DV)	Section A-10: (DM-DV)	Section A-11: (DM-DV)
N Valid	49	49	49	49	49	49	49	49	49	49	49
Missing	0	0	0	0	0	0	0	0	0	0	0
Mean	4.39	4.49	4.29	4.20	3.78	2.04	4.24	4.39	4.18	4.29	4.14
Std. Deviation	.606	.505	.677	.577	.919	.865	.693	.606	.808	.577	.736
Minimum	3	4	2	2	2	1	2	2	1	3	2
Maximum	5	5	5	5	5	4	5	5	5	5	5

Frequency Table

Section A-01: (DM-DV)

Managers make better decision by using activity-based costing and activity-based planning.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	3	6.1	6.1	6.1
	Agree	24	49.0	49.0	55.1
	Strongly Agree	22	44.9	44.9	100.0
	Total	49	100.0	100.0	

Section A-02: (DM-DV)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	25	51.0	51.0	51.0
	Strongly Agree	24	49.0	49.0	100.0
	Total	49	100.0	100.0	

Section A-03: (DM-DV)

Senior manager believe that activity-based costing and activity-based planning help for DM

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	1	2.0	2.0	2.0
Don't Know	3	6.1	6.1	8.2
Agree	26	53.1	53.1	61.2
Strongly Agree	19	38.8	38.8	100.0
Total	49	100.0	100.0	

Section A-04: (DM-DV)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	1	2.0	2.0	2.0
Don't Know	1	2.0	2.0	4.1
Agree	34	69.4	69.4	73.5
Strongly Agree	13	26.5	26.5	100.0
Total	49	100.0	100.0	

Section A-05: (DM-DV)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	8	16.3	16.3	16.3
Don't Know	3	6.1	6.1	22.4
Agree	30	61.2	61.2	83.7
Strongly Agree	8	16.3	16.3	100.0
Total	49	100.0	100.0	

Section A-06: (DM-DV)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	22.4	22.4	22.4
	Disagree	31	63.3	63.3	85.7
	Don't Know	1	2.0	2.0	87.8
	Agree	6	12.2	12.2	100.0
	Total	49	100.0	100.0	

Section A-07: (DM-DV)

Accurate information can be generated by ABC for decision making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	2.0	2.0	2.0
	Don't Know	4	8.2	8.2	10.2
	Agree	26	53.1	53.1	63.3
	Strongly Agree	18	36.7	36.7	100.0
	Total	49	100.0	100.0	

Section A-08: (DM-DV)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	2.0	2.0	2.0
	Agree	27	55.1	55.1	57.1
	Strongly Agree	21	42.9	42.9	100.0
	Total	49	100.0	100.0	

Section A-09: (DM-DV)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	2.0	2.0	2.0
	Don't Know	6	12.2	12.2	14.3
	Agree	24	49.0	49.0	63.3
	Strongly Agree	18	36.7	36.7	100.0
	Total	49	100.0	100.0	

Section A-010: (DM-DV)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	3	6.1	6.1	6.1
	Agree	29	59.2	59.2	65.3
	Strongly Agree	17	34.7	34.7	100.0
	Total	49	100.0	100.0	

Section A-011: (DM-DV)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	6.1	6.1	6.1
	Don't Know	1	2.0	2.0	8.2
	Agree	31	63.3	63.3	71.4
	Strongly Agree	14	28.6	28.6	100.0
	Total	49	100.0	100.0	