

# Product Costing in Palestinian Manufacturing Organizations

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## Abstract

This paper presents and comments on the findings from a questionnaire survey on the product costing practices used by 32 manufacturing companies in Palestine, with a response rate 100 per cent. The aims of the paper are (1) to provide evidence to ascertain the extent of product costing can be judged, (2) to gather evidence about the current status of activity-based costing adoption and implementation, and (3) to compare and comment upon the theory and practice of product costing. The survey findings indicate that product costs computed to meet inventory valuation requirements are widely used for decision-making and internal profit measurement. The majority of companies, however, used both full costs and variable costs for decision-making and findings suggest that product information is used in a flexible manner. The paper reports on the methods used by companies to compute full product costs. Most organizations used questionable overhead allocations that are likely to result in the reporting of distorted product costs. The concluding sections of the paper discuss the possible reasons why observed practices differ from conventional wisdom and suggest areas where further research is required.

**Keywords:** Activity-based costing (ABC); activity-based management (ABM); profitability; overheads; traditional cost accounting; decision-making ; strategic management

## Introduction

An increasing attention has been focused in recent years on the theory and practice of product costing. There are two factors that appear to account for this situation. The first factor arises from the emergence of a belief that there is a wide gap between the theory and practice of management accounting (Belt, 1916; Scapens, 1991; Sharman, 2003; Clinton, 2004). Also, a manufacturing process that may possibly decrease product costs and improve product quality does have costs. Sometimes workers become so focused on their own tasks that they fail to consider how what they do affects everything else. Like a player in a game, they may become more concerned with how they personally are perceived (scoring) rather than if the team is winning the game. Sharman (2003) has noted that, so intricate is the scoring process that some players become distracted and concentrate on keeping score rather than playing the game (Enron, WorldCom). In those instances, the analysts (unintentionally perhaps) create business performance criteria based on scorekeeping intricacies rather than actual playing ability. The second factor relates to the enormous amount of publicity that has been generated by the writings of Kaplan (1984, 1985, 1988, 1990), Johnson and Kaplan (1987), Cooper (1990), Bjornenak and Falconer (2002), Kaplan (2006), and Kaplan and Porter (2011). The current product

costing systems were criticized in a series of articles that emphasized: (1) product costs that are computed to meet financial accounting inventory valuation requirements are also used for decision-making ; (2) over-simplistic allocation methods of overhead rates are widely used to compute distorted product costs ; (3) direct labour-based overhead allocation bases are widely used in machine-paced and automated production environment ; (4) external financial reporting conventions encourage a financial accounting mentality and this has resulted in product costing practices becoming subservient to financial accounting practices.

The perceptions of the gap between management accounting theory and practice have been derived mainly from observations from a small number of companies, anecdotal evidence and the impressions gained through informal contacts between academics and practitioners, and not from a large-scale surveys practice (Anthony, 1989; Cooper, 2000; Shah et al., 2011). The above criticisms provided the impetus for undertaking a questionnaire survey which aimed to gather empirical evidence capable of providing an overview of current management accounting practices in Palestinian manufacturing companies. The survey gathered information on a wide range of financial accounting and management accounting practices, including product costing, pricing, budgeting, performance reporting, standard costing, capital investment appraisal, and the impact of advanced manufacturing technologies, divisional performance measurement, and transfer pricing (Drury et al., 1993).

This paper focuses on the survey findings relating to product costing. In particular, the aims are: (1) to provide evidence to ascertain the extent to which criticisms of current product costing practices can be judged; (2) to compare and comment upon the theory and practice of product costing.

The paper consists of seven sections. The purpose of the product costing is discussed in the first section. This is followed by a review of the theory and particular practice of product costing. The thirds section comments briefly on previous product costing studies and the fourth section describes the questionnaire survey. The survey findings are presented in the fifth section and this is followed by a discussion of the possible explanations of the observed practices. The paper is concluded with some suggestions for further research.

## **The Purpose of Product Costing**

Management accounting textbooks (e.g. Kaplan and Atkinson, 1989; Horngren and Foster, 1991; Anthony and Reece, 1995; Drury, 2004) state that product costs are required for two purposes: (1) for financial accounting to allocate the manufacturing costs incurred during a period between cost of goods sold and inventories; (2) to provide useful information to stakeholders for economic decision-making requirements. Brignall et al. (1991) and Banker et al. (2008) have pointed out that knowing the costs of different products can be useful information for making judgments about their relative profitability and performance, which may lead to decisions about resource allocations, shifting money away from unrewarding activities to those which offer the greatest benefit, or to moves to improve a product's cost performance.

Surveys of pricing methods (e.g., Govindarajan and Anthony (1983) in the USA; Mills (1988) in the UK; Christensen and Wagenhofer (1997), in Germany ; Rattray et al. (2007), in New Zealand; Zoysa and Herath, (2007), in Japan ; Jinkens (2010), in Germany and USA) have indicated that product costs play an important role in pricing decisions. These studies suggest that cost-plus pricing is widely used, particularly in thin markets where customized products are produced that do not have readily available market prices. Product costs are also of considerable importance in competitive markets where an established market price exists (Rao et al., 2000).

For cost control, textbooks advocate that costs should be traced to functional responsibility centers rather than to products. Whereas reported product costs can be used as a mechanism to motivate managers to manage and control costs. Target costing has recently been widely publicized whereby target costs and not actual costs form the basis of product decisions (Hiromoto, 1988). Production management is expected to meet the target costs. If the projected product cost is above the

target cost then product designers focus on modifying the design of the product so that it becomes cheaper to produce. Manufacturing engineers also focus on methods of improving production efficiency so that the target cost can be achieved. Target costing is often associated with new products, but it can also be applied to cost reduction exercise for existing products.

Drury (2007) suggests that the accuracy of product costs should be dependent upon the purpose for which the cost information is required. It may not be necessary to measure accurately the resources consumed by individual products to meet financial accounting requirements. A well-designed product costing system should analyze accurately the total costs incurred during a period between cost of sales and inventories. An inaccurate individual product costs may still provide a reasonable approximation of how much of the total expenses for the period should be attributed to cost of goods sold and inventories. But, more accurate product costs are needed for decision-making purposes to distinguish between profitable and unprofitable products and activities. If cost system does not capture accurately enough the consumption of resources by products, the reported product costs will be distorted, and there is a danger that managers may drop profitable products or continue the production of unprofitable products. Anthony and Reece (1995) advocate that either companies should develop two separate product costing systems, one for decision making, and the other for inventory valuation, or companies should opt out to invest in a single system on the basis of cost versus benefits to meet stock valuation requirements. This has resulted in a situation where costs that have been computed to value inventories are also being used for decision-making and profitability analysis.

### **The Theory and Practice of Product Costing**

Planning involves making decisions. Decisions are arrived at by: (1) recognizing that a problem or an opportunity exists, (2) identifying alternative ways of addressing the problem or opportunity, (3) analyzing the consequences of each alternative, and (4) comparing the consequences so as to decide which is best. Accounting information is useful especially in the analysis step of decision-making process (Devine et al., 2004). This implies that special studies should be undertaken when the need arises, such as when specific products have been identified that require pricing or abandonment decisions. The decision-relevant approach focuses on whatever planning time of a given situation is considered appropriate for the decision-maker. Hence, both the short-term and long-term consequences can be examined when considering alternative courses of action. All those fixed costs will be avoided in the longer term if a product was discontinued. However, most textbooks tend to adopt a short-term perspective when they illustrate decision-relevant costs. This means that fixed costs are assumed to remain constant in irrespective of future decisions. Therefore, variable costs represent the only incremental costs that are relevant for making short-term decisions. But, practitioners prefer to use full costs to set selling prices due to adopting a longer-term strategic view rather than variability in costs of short-term (Anthony et al., 2011). It is also not feasible to generate unique relevant costs for each decision, because the range of possibilities faced by managers is enormous (Cooper and Kaplan, 1991). The full costs are widely used because decision-relevant costs are only appropriate for undertaking special studies that require decisions on product introduction, abandonment or pricing, once specific products have been identified. Kaplan (1990) has argued that a product costing system is required that reports average long-term product costs derived from activity-based costing (ABC) systems. The product costs reported don't provide information that can be used directly for decision making. Instead, they report attention-directing information by highlighting those products that require more of detailed special studies. Full product costs used for decision-making are derived from product systems that were designed to meet financial accounting requirements (Drury, 2007). These systems were designed decades ago, when most companies manufactured a narrow range of products and direct labour and material costs were the dominant factory costs. Overhead costs were relatively small and the distortions arising from inappropriate overhead allocations were not of significance. Information processing costs were high and it was therefore difficult to justify more sophisticated methods of

tracing overheads to products. Companies now a day produce a wide range of products and overhead costs are of considerable importance, and a simplistic overhead allocations can no longer be justified, particularly when information processing costs are no longer high nor a barrier to introducing more sophisticated systems. It is against this background that ABC has emerged (Cooper and Kaplan, 1991). It is important that a product costing system generates a reasonably accurate estimate of the resources consumed by each product.

### **Previous Studies**

Previous surveys (Schwarzbach, 1985 in USA; Ask and Ax, 1992 in Sweden; Theunisse, 1992 in Belgium; Drury and Tayles, 1994 in UK; O'Dea and Clarke, 1994 in Ireland; de With and van der Woerd, 1994, in Netherlands; Scapens et al. (1996) in UK; Drury and Tayles, 2000, in UK) have focused on the changes in management accounting practices that are taking place as a result of the changing manufacturing environment. Little evidence was found from these studies to indicate that either existing techniques are being adapted or new techniques are being implemented. The studies have reported that direct labour is the predominant method that is used to allocate overhead costs to the products though some respondents were dissatisfied with their product costing systems. Most of the surveys provide little insight into how companies compute product costs for decision-making.

### **Research Method**

In 2009 a survey was undertaken which aimed to gather empirical evidence capable of providing an overview of current management accounting practices of manufacturing companies in the Israeli Occupied Territories of Palestine. The questionnaire was tested in five selected pilot companies before approaching the sample companies. Hence, the final version of the questionnaire included seventy-four questions, of which forty-five questions related to product costing, ABC implementation, ABC benefits and problems of ABC implementation.

The main purpose of this study is to describe and analyze the present state of, and trends of development, in current cost accounting practices as a result of the aftermath of Palestinian second uprising crisis (September 2000 – November 2004). This is part of PhD studies at the University of Lincoln, England.

### **Sample Selection**

A sampling frame consisting of 339 Pal Trade companies was extracted from a CD-ROM members information data base all of which registered companies with well reputed trade description. Only a population of 32 manufacturing companies was certified by Palestinian Standards Institution (PSI), and they were picked up for this study. The companies were small, medium and large-sized in terms of number of employees, capital investment and sales turnover. Also, the sample design recognized that many larger Palestinian manufacturing companies operate through a divisional structure in which separate divisions are not separate legal entities for financial reporting purposes, but they are equivalent to separate business units in terms of operational characteristics. Therefore, the sample design allowed for the inclusion of different divisions, subsidiaries, plants or sites of the same company, or within the same group of companies, provided that they were engaged in different activities. Since the distinction between a divisional and a subsidiary business is predominantly a nominal one, it is appropriate to base any broad analysis of practice on strategic business units rather than trying to analyze the responses by separate group reporting entities. As the survey subject material was of a specialist nature, it was necessary to ensure that those completing the questionnaire were properly qualified to do so in terms of executive post and professional qualifications. Each of 32 ISO organizations were contacted by telephone and an hour meeting was booked with a management accounting executive to complete the questionnaire. The response rate was 100 percent of the companies included in the survey.

### Analysis by Size, Principal Activities and Cost Structure

The questionnaire replies were recorded on a database and the Software Statistical Package for Social Sciences (SPSS –version 17) was used to analyze the replies. Table 1 provides an analysis of the characteristics of questionnaire respondents in terms of gender, age, level of education, job title and work experience.

**Table 1:** Characteristics of interviewees

Characteristics	Categories	Number	Percentage
Gender	Female	0	0.0% (50.7% of population)
	Male	32	100.0% (49.3% of population)
Age	Under 25 years	0	00.0% (65.1% of male population)
	25-35	12	37.5% (14.8% of male population)
	36-45	10	31.2% (08.9% of male population)
	46-55	7	21.9% (04.6% of male population)
	56-65	3	09.4% (03.2% of male population)
	Over 65	0	00.0% (03.4% of male population)
Education	Secondary school	5	15.6%
	Undergraduate	2	6.3%
	Graduate	17	53.1%
	Postgraduate	8	25.0%
Job title	Financial Controller	4	12.5%
	Accounting Manager	10	31.3%
	Chief Accountant	5	15.6%
	Accountant	0	.0%
	General Manager	13	40.6%
Work experience	Less than 2 years	0	0.0%
	5-Feb	7	21.9%
	10-May	6	18.7%
	Over than 10 years	10	59.4%

**Note:** Data had drawn from Questions 1 (gender), 2 (age), 3 (level of education), 4 (job title) and 5 (work experience). Population Data from PCBS (1997) Demographic Survey in the West Bank and Gaza Strip: Final Report. PCBS: Ramallah, Palestine.

Table 2 presents details of the 36 principal activities of the 32 individual units in the survey.

**Table 2:** Company business sector

	Business sector	Frequency	Percentage
1	Agriculture	6	7.9
2	Bank	0	0.0
3	Building materials	4	5.3
4	Chemicals & Plastics	7	9.2
5	Commerce	7	9.2
6	Communication	1	1.3
7	Computer equipments	1	1.3
8	Conglomerate	3	4.0
9	Contracting	2	2.6
10	Electrical products	1	1.3
11	Electronic components	1	1.3
12	Energy (oil/petrol/gas)	4	5.3
13	Entertainment & Recreation	0	0.0
14	Finance & Securities	2	2.6
15	Food & Beverages	8	10.5
16	Furnishing	2	2.6
17	Health care services	1	1.3
18	Hotel & Travel service	1	1.3

**Table 2:** Company business sector - continued

19	Household goods	1	1.3
20	Insurance	1	1.3
21	Jewelry & Ornaments	1	1.3
22	Machinery & Equipments	2	2.6
23	Mining	0	0.0
24	Motor vehicles & Spare parts	2	2.6
25	Paper & Packaging	2	2.6
26	Pharmaceuticals & Cosmetics	4	5.3
27	Printing & Publishing	2	2.6
28	Professional services	0	0.0
28	Property development	2	2.6
30	Textile & Footwear	3	4.0
31	Tobacco	0	0.0
32	Transportation	0	0.0
33	Travel & Tourism	1	1.3
34	Vehicles (heavy) & Spare parts	2	2.6
35	Warehouse & Silo	2	2.6
36	Other	0	0.0

**Note:** Data had drawn from Question 12 (enterprise business sector). They were mainly manufacturers and few having business diversification.

As usual in business administration studies, the unit size was initially measured by the number of personnel. Table 3 presents details of the company micro, small, medium and large sized according to World Bank (2008).

**Table 3:** Number of employees

Number of employees	Size	Frequency	Percentage
1-5	Micro	1	3.1
6-15	Small	6	18.8
16-25	Medium	6	18.8
More than 25	Large	19	59.4

**Note:** Data had drawn from Question 13 (number of employees).

Table 4 presents analysis of the annual sales turnover for the 32 registered ISO companies. A response bias test was performed with respect to size and industry classification by comparing the sales turnover and business classification of the responding companies with those of sampled population. The Kolmogorov-Smirnov non-parametric test was used. There was no evidence of any response bias with respect to size or industry.

**Table 4:** Annual sales turnovers of companies

Annual sales (New Israeli Shekel)	Frequency	Percentage
0- <0.1 million	0	0.0%
0.1- <0.5 million	0	0.0%
0.5- <1 million	1	3.1%
1- <5 million	9	28.1%
5- <10 million	2	6.3%
>10 million	20	62.5%

**Note:** Data had drawn from Question 15 (annual sales)

Table 5 presents the paid-up capital of the companies using the classification of World Bank (2008).

**Table 5:** Paid-up capital of companies

Paid-up capital (New Israeli Shekel)	Frequency	Percentage
Less than 5 million	10	31.3
5 -15 million	7	21.9
15 -25 million	3	9.4
More than 25 million	12	37.5

**Note:** Data had drawn from Question 14 (paid-up capital).

### Survey Findings

Table 6 shows that the majority of respondents had used 'single computer-based accounting system' (50.0%), followed by 'three separate accounting system' (46.9%), and 'single manual accounting system' (3.1%). Their accounting systems are programs that supply information about the value of direct labor hours and numbers of units produced. With the help of data such as product cost, their managers were able to generate estimate of cost associated with different activity carried out in the enterprise. The costs systems operate by taking total cost as basic for calculation. Accordingly, costing is essential for every enterprise, as every manufacturing and other department has to be assigned accurate budget for proper operation (Hansen, Mowen and Guan, 2009). The costing system has provided information that is useful to managers for minimizing waste and allocating resources to different departments. It is important for managers therefore to appreciate that the resources necessary for designing and implementing a cost system should not exceed than the benefit drew out from the system (Thomsett, 2002).

**Table 6:** Accounting systems

Accounting systems	Number	Percentage
Single manual accounting system	1	3.1%
Single computer-based accounting system	16	50.0%
Three separate accounting systems: stock evaluation; decision-making; planning, control, performance.	15	46.9%

**Note:** Data had drawn from Question 25 (accounting system).

Individual respondents were asked to indicate the allocation of overheads to product costing. Table 7 shows a blanket one value to all products (56.3%), and different overhead rates to different products (43.8%). The simplest product costing system uses a single global plant-wide rate to allocate overheads to products. Product costs derived from plant-wide rates may be acceptable for stock valuation purposes, but it is unlikely that they will be sufficiently accurate for decision-making (Howell et al., 1987).

**Table 7:** Allocation of overhead rates

Features	N	Percentage
Using one value of overhead rates to all products:		
Yes	18	56.3%
No	14	43.8%

**Note:** Data had drawn from Question 26 (allocation of overhead rates).

Table 8 shows the many variables that had influenced product costing system. The majority of respondents (96.9%) put 'yes' to the 'extent of Israeli occupation' due to so many army checkpoints on the roads and tight restriction on what raw materials were permitted to import. It was followed by 'the diversity of products produced' (90.6%), 'size of the enterprise' (87.5%), 'the proportion of overhead (indirect) costs' (87.5%), 'the number of products produced (84.4%),'the degree of competition (75.0%),'information processing technology costs' (71.9%), the application of cause and effect costing,

i.e. 'application of activity-based costing (65.6%), and 'the extent of use of lean production techniques' (46.9%), respectively.

**Table 8:** Influences of product costing system

Variable	N	Percentage
Information processing technology costs:		
Yes	23	71.9%
No	9	28.1%
The degree of competition faced:		
Yes	24	75.0%
No	8	25.0%
The diversity of products manufactured:		
Yes	29	90.6%
No	3	9.4%
The number of products produced:		
Yes	27	84.4%
No	5	15.6%
The proportion of overhead (indirect) costs that cannot be directly product assigned:		
Yes	28	87.5%
No	4	12.5%
Application of activity-based costing:		
Yes	21	65.6%
No	11	34.4%
Size of enterprise:		
Yes	28	87.5%
No	4	12.5%
Extent of use of lean production techniques:		
Yes	15	46.9%
No	17	53.1%
Extent of Israeli occupation:		
Yes	31	96.9%
No	1	3.1%

**Note:** Data had drawn from Question 27 (influences of product costing system).

Table 9 shows the Chi-Square test of influences of product costing system. Chi-Square frequency test is congruent with values in Table 8. The maximum value was 'the extent of Israeli occupation' (28.125), followed by 'the diversity of products manufactured' (21.125), whereas 'application of activity-based costing (3.125) was the one before last, followed by the least value of 'extent of use of lean production techniques' (0.125).

**Table 9:** Chi-Square test of influences of product costing system

Variable	Observed N	Expected N	Residual	Chi-Square <sup>a</sup>	df	Asymp. Sig
<u>Information processing technology costs :</u>				6.125	1	0.013
Yes	23	16.0	7.0			
No	9	16.0	-7.0			
<b>Total</b>	<b>32</b>					
<u>The degree of competition faced:</u>				6.125	1	0.013
Yes	23	16.0	7.0			
No	9	16.0	-7.0			
<b>Total</b>	<b>32</b>		<b>7.0</b>			
<u>The diversity of products manufactured:</u>				21.125	1	0.000
Yes	29	16.0	13.0			
No	3	16.0	-13.0			
<b>Total</b>	<b>32</b>					

**Table 9:** Chi-Square test of influences of product costing system - continued

<u>The number of products produced:</u>				15.125	1	0.000
Yes	27	16.0	11.0			
No	5	16.0	-11.0			
<b>Total</b>	<b>32</b>					
<u>The proportion of overhead (indirect) costs that cannot be directly product assigned:</u>				18.000	1	0.000
Yes	28	16.0	12.0			
No	4	16.0	-12.0			
<b>Total</b>	<b>32</b>					
<u>Application of activity-based costing:</u>				3.125	1	0.077
Yes	21	16.0	5.0			
No	11	16.0	-5.0			
<b>Total</b>	<b>32</b>					
<u>Size of enterprise:</u>				18.000	1	0.000
Yes	28	16.0	12.0			
No	4	16.0	-12.0			
<b>Total</b>	<b>32</b>					
<u>Extent of use of lean production techniques:</u>				0.125	1	0.724
Yes	15	16.0	-1.0			
No	17	16.0	1.0			
<b>Total</b>	<b>32</b>					
<u>Extent of Israeli occupation:</u>				<b>28.125</b>	1	0.000
Yes	31	16.0	15.0			
No	1	16.0	-15.0			
<b>Total</b>	<b>32</b>					

**Note:** Data had drawn from Question 27 (influences of product costing system). <sup>a</sup> 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.0 and the observed frequencies are listed in Table 8. Residual is the difference between observed and expected frequencies. At the 0.05 level of significance.

Accounting is a process of identifying, classifying, recording and summarizing of business transactions in monetary terms and communicating the results to decision makers. Therefore, to satisfy the needs of various users at the lowest possible cost, accounting has been separated into two branches of financial accounting and management accounting in which Table 10 shows domineering of the first (75%).

**Table 10:** Does financial accounting dominate management accounting?

Features		N	Percentage
Financial accounting dominates management	Yes	24	75%
Financial accounting does not dominate management	No	8	25%

**Note:** Data had drawn from Question 28 (financial and management accounting).

Cost management systems are designed to provide more accurate information to managers about the cost of profitability of their businesses, products, services and customers (Argyries and Kaplan, 1994). Generally, they accumulate cost by activities rather than budgeted line items (Turney, 1991): thereby, providing a cross-functional view of how activities that comprise an enterprise business processes consume resources (Cooper and Kaplan, 1991). They generate cost data that is more firmly grounded in organizational processes (Greenwood and Reeve, 1992), thereby enabling production managers to use the cost system to manage the activities that cause costs and have the biggest impact on profitability. Hence, Table 6 shows that enterprises had been attempted conformity.

Table 11 shows Mann-Whitney test, Chi-Square test and frequencies for budget importance in the functions of the enterprise. Chi-Square was highest for 'operation' (13.500), 'decentralization' (12.375), 'cost control' (10.750), 'compensation' (9.563), and 'performance evaluation' (4.938).

**Table 11:** Mann-Whitney (NPar), Chi-Square and frequencies statistics for importance of budget in different functions

Features	Observed N	Expected N	Residual N	Chi- Square <sup>a,b,c</sup>	df	Asymp. Sig.
<u>Cost control:</u>				10.750	3	0.013
little important	3	8.0	-5.0			
moderately imp	4	8.0	-4.0			
very important	11	8.0	3.0			
critically imp	14	8.0	6.0			
<b>Total</b>	<b>32</b>					
<u>Performance:</u>				4.938	2	0.085
moderately imp	5	10.7	-5.7			
very important	15	10.7	4.3			
critically imp	12	10.7	1.3			
<b>Total</b>	<b>32</b>					
<u>Compensation:</u>				9.563	4	0.048
not important	2	6.4	-4.4			
little important	4	6.4	-2.4			
moderately imp	10	6.4	3.6			
very important	11	6.4	4.6			
critically imp	5	6.4	-1.4			
<b>Total</b>	<b>32</b>					
<u>Operation:</u>				<b>13.500</b>	3	0.004
little important	1	8.0	-7.0			
moderately imp	5	8.0	-3.0			
very important	13	8.0	5.0			
critically imp	13	8.0	5.0			
<b>Total</b>	<b>32</b>					
<u>Decentralization:</u>				12.375	4	0.015
not important	3	6.4	-3.4			
little important	1	6.4	-5.4			
moderately imp	7	6.4	0.6			
very important	12	6.4	5.6			
critically imp	9	6.4	2.6			
<b>Total</b>	<b>32</b>					
Valid N (listwise)	32					

**Note:** Data had drawn from Question 35 (budget importance).

- a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 8.0
  - b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 10.7
  - c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 6.4
- At the 0.05 level of significance.

Table 12 shows that respondents were asked to indicate the importance of different factors in allocating overhead costs; 'pricing' had the most highest mean (4.5000), 'cost control' (4.4375), 'manager's performance evaluation for appraisal' (4.0625), 'planning' (4.0313), 'department evaluation' (3.9062), 'addition/deletion of a product' (3.8437), and the last lowest mean for 'external reporting' (3.6250). The administration of overhead expenses is not traceable directly to the sites. Expenses sometimes split on an arbitrary basis and charged to each contract. Of course, if there were only one contract then all the overhead expenses would quite rightly be chargeable against it. On the other hand, if there are fifty contracts being carried on, any allocation must be arbitrary. No one can really apportion on a 'scientific' basis the administration overhead expenses such as managing director's salary, the cost of advertising the right 'image', the cost of running accounting machinery for the records of the whole enterprise, and these are only few of such expenses (Drury, 2007). Hence, 'pricing' variable could be a viable mechanism to bear more or less overhead costs portion and the close range in their means signify the relevant importance.

**Table 12:** Descriptive statistics for importance of different factors in Allocating overhead costs

Features	N	Minimum	Maximum	Mean	Std.Deviation
Cost control	32	2.00	5.00	4.4375	0.8007
Pricing	32	3.00	5.00	<b>4.5000</b>	0.6720
External reporting	32	1.00	5.00	3.6250	1.0999
Planning	32	2.00	5.00	4.0313	0.8975
Addition / deletion	32	2.00	5.00	3.8437	1.0809
Dept. evaluation	32	2.00	5.00	3.9062	1.0583
Manager's appraisal	32	2.00	5.00	4.0625	1.0758
Valid N (listwise)	32				

**Note:** Data had drawn from Question 36 (factors affect overhead costs allocation).

Table 13 shows individual respondents who were also asked to allocate overhead costs to products / services, the most common base was 'units produced' (93.8%). The 'direct labour batch cost', 'direct labour hour' and 'direct materials' have been used intensively by respondent enterprises (90.6%). Also, 'direct materials' (84.4%) and 'average set-up times' (78.1%) have been used by relevant minority enterprises. The 'average set-up times' has been the least common base. Since, 'units produced' is the real outcome of production value chain, it was prescribed to as the bases for overhead costs allocation.

**Table 13:** Frequencies statistics of bases used to allocate overhead costs

Features	Frequency	Percent	Valid Percent	Cumulative Percent
<b><u>Direct labour batch cost:</u></b>				
Valid	Yes	29	58.0%	90.6%
	No	3	6.0%	100.0%
	Total	32	64.0%	100.0%
Missing	System	18	36.0%	
Total		50	100.0%	
<b><u>Direct labour hour:</u></b>				
Valid	Yes	29	58.0%	90.6%
	No	3	6.0%	100.0%
	Total	32	64.0%	100.0%
Missing	System	18	36.0%	
Total		50	100.0%	
<b><u>Machine hours:</u></b>				
Valid	Yes	27	54.0%	84.4%
	No	5	10.0%	100.0%
	Total	32	64.0%	100.0%
Missing	System	18	36.0%	
Total		50	100.0%	
<b><u>Direct materials:</u></b>				
Valid	Yes	29	58.0%	90.6%
	No	3	6.0%	100.0%
	Total	32	64.0%	100.0%
Missing	System	18	36.0%	
Total		50	100.0%	
<b><u>Units produced:</u></b>				
Valid	Yes	30	60.0%	93.8%
	No	2	4.0%	100.0%
	Total	32	64.0%	100.0%
Missing	System	18	36.0%	
Total		50	100.00%	
<b><u>Average set-up time:</u></b>				
Valid	Yes	25	50.0%	78.1%
	No	7	14.0%	100.0%
	Total	32	64.0%	100.0%
Missing	System	18	36.0%	
Total		50	100.0%	

**Note:** Data had drawn from Question 37 (bases in cost allocation).

Table 14 that shows the techniques used to calculate the denominator for overhead reflects a total frequency of 32 for each featured category. The most common criteria used by respondents were both 'last year actual capacity' and 'practical capacity' at valid (34.4%), followed by 'this year actual capacity' valid (15.6%), 'normal capacity' valid (15.6%), lastly 'theoretical maximum capacity' and 'this year budget capacity' at valid (0.0%). These percentages are derived upon from the total 'ticks' of each featured category out of 32 respondents. However, these calculated percentages are congruent with the frequencies cumulative percents for a 'yes' answer, and a 'no' answer for 'theoretical maximum capacity' and 'this year budget capacity'.

**Table 14:** Frequencies statistics of techniques used to calculate overhead rates

Features		Frequency	Percent	Valid Percent	Cumulative Percent
<b><u>Theoretical maximum capacity:</u></b>					
Valid	Yes	0			
	No	32	64.0%	100.0%	100.0%
Missing	System	18	36.0%		
Total		50	100.0%		
<b><u>Practical capacity:</u></b>					
Valid	Yes	11	22.0%	<b>34.4%</b>	34.4%
	No	21	42.0%	65.6%	100.0%
	Total	32	64.0%	100.0%	
Missing	System	18	36.0%		
Total		50	100.0%		
<b><u>Normal capacity:</u></b>					
Valid	Yes	5	10.0%	15.6%	15.6%
	No	27	54.0%	84.4%	100.0%
	Total	32	64.0%	100.0%	
Missing	System	18	36.0%		
Total		50	100.0%		
<b><u>This year budget capacity:</u></b>					
Valid	Yes	0			
	No	32	64.0%	100.0%	100.0%
Missing	System	18	36.0%		
Total		50	100.0%		
<b><u>This year actual capacity:</u></b>					
Valid	Yes	5	10.0%	15.6%	15.6%
	No	27	54.0%	84.4%	100.0%
	Total	32	64.0%	100.0%	
Missing	System	18	36.0%		
Total		50	100.0%		
<b><u>Last year actual capacity:</u></b>					
	Yes	11	22.0%	<b>34.4%</b>	34.4%
	No	21	42.0%	65.6%	100.0%
	Total	32	64.0%	100.0%	
Missing	System	18	36.0%		
Total		50	100.0%		

**Note:** Data had drawn from Question 38 (bases used to calculate overhead rates).

The treatment of non-manufacturing costs has been virtually ignored in the literature, presumably because external financial accounting regulations state that they should not be allocated to products and also because it is generally assumed that, in the short term, they don't represent decision relevant costs. Question 39 sought to ascertain the methods that organizations use to trace non-manufacturing costs to products as well as direct manufacturing costs. Table 15 shows how respondents' enterprises had prescribed to the categorization of breaking down the total manufacturing costs into four different sets of cost compositions. Set A, Set B, Set C, and Set D for direct material, direct labour, overhead of production/service and overhead of non o production/service, in which each

respondent has identified a specific set that, is congruent with the enterprise circumstances. The most common composite practices have been Set D (40.6%), Set C (28.1%), followed by both Set A and Set B (15.6% each). Set D shows that both direct labour and direct material are at 40% each, whereas both overhead production and overhead of non-production are at 10% each of total cost. Hardy and Hubbard (1992) claimed that cost structure of manufacturing enterprises has changed. In traditional labor intensive manufacturing enterprises, direct labor can constitute 40-60% of manufacturing cost, direct materials can range from 30-40% and overhead could be as low as 8-12% of total manufacturing cost.

**Table 15:** Frequencies statistics of break down total enterprise

Features	N	Percent	Valid Percent	Cumulative Percent
Valid <b>Set A:</b>	5	10.0%	15.6%	15.6%
Direct material	80%			
Direct labour	10%			
Overhead of production	05%			
Overhead of non-production	05%			
<b>Set B:</b>	5	10.0%	15.6%	31.3%
Direct material	60%			
Direct labour	10%			
Overhead of production	15%			
Overhead of non-production	15%			
<b>Set C:</b>	9	18.0%	28.1%	59.4%
Direct material	55%			
Direct labour	20%			
Overhead of production	15%			
Overhead of non-production	10%			
<b>Set D:</b>	13	26.0%	<b>40.6%</b>	100.0%
Direct material	40%			
Direct labour	40%			
Overhead of production	10%			
Overhead of non-production	10%			
Total	32	64.0%	100.0%	
Missing System	18	36.0%		
<b>Total</b>	<b>50</b>	<b>100.0%</b>		

**Note:** Data had drawn from Question 39 (cost categories).

Busch (1990) reported that material cost accounts for between 50 and 70% of revenues, depending on the industry. Even a small reduction in these costs can have a substantial impact on profitability. Commentators have been critical of the continued use of direct labour based allocation methods, particularly in a machine-paced environment. Our findings indicate that direct labour hours/cost is still the most frequently used allocation base. Cohen and Paquette (1991) and Emore and Ness (1991) reported similar USA findings with 74 percent and 62 percent respectively of the companies using direct labour methods.

Table 16 shows respondent enterprises answers to the question of satisfaction with the performance of overall product costing system and its allocations of overhead cost. Respondents prescribed to 'reasonably satisfied, although some improvement may be useful' valid (53.1%), 'needs improvements, but it is still usable' valid (31.3%), 'very satisfied, no improvement required' valid (15.6%), and 'dissatisfied, requires major improvement' valid (0.0%). Latshaw and Cortese-Danile (2002) have claimed that no matter how complicated the costing system is, the assigning of costs to cost objects is still an estimate.

**Table 16:** Frequencies statistics of satisfaction with current overhead cost allocations and overall product costing system

Features		N	Percent	Valid Percent	Cumulative Percent
<u>Very satisfied, no improvement required:</u>					
Valid	Yes	5	15.6%	15.6%	15.6%
	No	27	84.4%	84.4%	100.0%
	<b>Total</b>	<b>32</b>	<b>100.0%</b>	<b>100.0%</b>	
<u>Reasonably satisfied, although some improvement may be useful:</u>					
Valid	Yes	17	53.1%	53.1%	53.1%
	No	15	46.9%	46.9%	100.0%
	<b>Total</b>	<b>32</b>	<b>100.0%</b>	<b>100.0%</b>	
<u>Needs improvements, but is still usable:</u>					
Valid	Yes	10	31.3%	31.3%	31.3%
	No	22	68.8%	68.8%	100.0%
	<b>Total</b>	<b>32</b>	<b>100.0%</b>	<b>100.0%</b>	
<u>Dissatisfied, requires major improvement:</u>					
Valid	Yes	0	0.0%	0.0%	0.0%
	No	32	100.0%	100.0%	100.0%
	<b>Total</b>	<b>32</b>	<b>100.0%</b>	<b>100.0%</b>	

**Note:** Data had drawn from Question 41 (satisfaction with current costing system).

According to Hurst (1995), when the business is in economic crisis, the crisis forces an enterprise to learn fast how to restore itself through restructuring or reorganizing. Kloot (1997) also suggested that organizational learning stems from understanding the changes taking place in the external environment and adapting the organization to suit the changed environment.

Questions 42-46 asked the respondents to indicate knowledge of activity-based costing, kinds of costing systems in use at the organization, organization's planning on the use of activity-based costing, and adoption of activity-based costing. Although the essence of activity-based costing is based on the relevance of cause and effect, especially in a turmoil economic crisis in Palestine, no organization has yet implemented activity-based costing. Hence, individual respondents were asked to give their reasons for not adopting ABC as they continue with traditional cost accounting system (unpublished data). The reasons suggested in the questionnaire were classified into four categories: (i) inherent difficulties with ABC, (ii) enterprise hierarchy characteristics, (iii) enterprise nature of business, and (iv) confidence in their existing traditional cost accounting system. The respondents were asked to rate items on a five-point scale where "1" represented "not important", and "5" represented "critically important". The responses are shown in Table 17.

A learning organization is an organization that has developed the capacity to continuously learn, adapt, and change (Seng, 1990). Also, Kloot (1997) argued that organizational learning usually occurs when organizations are in a changed and competitive environment. Our unpublished data show that organizational learning had resulted from understanding the changes taking place in the external environment. Thus, the results here indicate that the crisis had brought about organizational learning in Palestinian enterprises and the Palestinian businesses were learning for survival.

**Table 17:** Reasons for not adopting Activity-based Costing (ABC)

Features	Observed N	Expected N	Residual N	Chi-Square <sup>a, b, c</sup>	df	Asymp. Sig.
Satisfied with current system:						
Not important	3	6.4	-3.4	14.563	4	0.006
Little important	2	6.4	-4.4			
Moderately important	4	6.4	-2.4			
Very important	13	6.4	6.6			
Critically important	10	6.4	3.6			
<b>Total</b>	<b>32</b>					

**Table 17:** Reasons for not adopting Activity-based Costing (ABC) - continued

<u>No significant problem with current costing system:</u>				3.813	2	0.149
Moderately important	6	10.7	-4.7			
Very important	15	10.7	4.3			
Critically important	11	10.7	0.3			
<b>Total</b>	<b>32</b>					
<u>Lack of awareness of ABC development:</u>				14.250	4	0.007
Not important	2	6.4	-4.4			
Little important	1	6.4	-5.4			
Moderately important	7	6.4	0.6			
Very important	11	6.4	4.6			
Critically important	11	6.4	4.6			
<b>Total</b>	<b>32</b>					
<u>Lack of expertise to implement ABC:</u>				20.813	4	0.000
Not important	1	6.4	-5.4			
Little important	2	6.4	-4.4			
Moderately important	4	6.4	-2.4			
Very important	11	6.4	4.6			
Critically important	14	6.4	7.6			
<b>Total</b>	<b>32</b>					
<u>Ambiguity of ABC benefits in literature:</u>				13.750	3	0.003
Not important	1	8.0	-7.0			
Moderately important	5	8.0	-3.0			
Very important	14	8.0	6.0			
Critically important	12	8.0	4.0			
<b>Total</b>	<b>32</b>					
<u>Costly to switch to ABC:</u>				14.563	4	0.006
Not important	2	6.4	-4.4			
Little important	1	6.4	-5.4			
Moderately important	7	6.4	0.6			
Very important	10	6.4	3.6			
Critically important	12	6.4	5.5			
<b>Total</b>	<b>32</b>					
<u>ABC consultants very costly:</u>				<b>27.062</b>	4	0.000
Not important	1	6.4	-5.4			
Little important	2	6.4	-4.4			
Moderately important	2	6.4	-4.4			
Very important	15	6.4	8.6			
Critically important	12	6.4	5.6			
<b>Total</b>	<b>32</b>					
<u>Higher priorities of other changes or projects:</u>				3.813	2	0.149
Moderately important	6	10.7	-4.7			
Very important	15	10.7	4.3			
Critically important	11	10.7	0.3			
<b>Total</b>	<b>32</b>					
<u>Lack of internal resources to install and operate:</u>				14.453	4	0.006
Not important	1	6.4	-5.4			
Little important	2	6.4	-4.4			
Moderately important	7	6.4	0.6			
Very important	12	6.4	5.6			
Critically important	10	6.4	3.6			
<b>Total</b>	<b>32</b>					

**Table 17:** Reasons for not adopting Activity-based Costing (ABC) - continued

Lack of top management support:				14.875	4	0.005
Not important	1	6.4	-5.4			
Little important	3	6.4	-3.4			
Moderately important	5	6.4	-1.4			
Very important	11	6.4	4.6			
Critically important	12	6.4	5.6			
<b>Total</b>	<b>32</b>					
<u>Resistance from employees and other management:</u>				14.562	4	0.006
Not important	1	6.4	-5.4			
Little important	4	6.4	-2.4			
Moderately important	4	6.4	-2.4			
Very important	11	6.4	4.6			
Critically important	12	6.4	5.6			
<b>Total</b>	<b>32</b>					
<u>Difficulties in selecting cost drivers:</u>				10.500	3	0.015
Not important	1	8.0	-7.0			
Moderately important	7	8.0	-1.0			
Very important	11	8.0	3.0			
Critically important	13	8.0	5.0			
<b>Total</b>	<b>32</b>					
<u>Difficulties in collecting data on the cost drivers:</u>				8.500	3	0.037
Little important	3	8.0	-5.0			
Moderately important	5	8.0	-3.0			
Very important	13	8.0	5.0			
Critically important	11	8.0	3.0			
<b>Total</b>	<b>32</b>					
<u>Difficulties in selecting appropriate English software package:</u>				9.250	3	0.026
Little important	2	8.0	-6.0			
Moderately important	6	8.0	-2.0			
Very important	13	8.0	5.0			
Critically important	11	8.0	3.0			
<b>Total</b>	<b>32</b>					
<u>Difficulties in finding Arabic software package:</u>				19.250	3	0.000
Little important	1	8.0	-7.0			
Moderately important	3	8.0	-5.0			
Very important	16	8.0	8.0			
Critically important	12	8.0	4.0			
<b>Total</b>	<b>32</b>					
<u>No intensity of competition: little important</u>	3	8.0	-5.0	9.250	3	0.026
Moderately important	5	8.0	-3.0			
Very important	10	8.0	2.0			
Critically important	14	8.0	6.0			
<b>Total</b>	<b>32</b>					
<u>Less complexity in products/ services and processes:</u>				5.750	3	0.124
Little important	3	8.0	-5.0			
Moderately important	7	8.0	-1.0			
Very important	12	8.0	4.0			
Critically important	10	8.0	2.0			
<b>Total</b>	<b>32</b>					

**Table 17:** Reasons for not adopting Activity-based Costing (ABC) - continued

<u>Have relative small proportion of overheads in total manufacturing/ service costs:</u>				3.813	2	0.149
Moderately important	6	10.7	-4.7			
Very important	15	10.7	4.3			
Critically important	11	10.7	0.3			
<b>Total</b>	<b>32</b>					
<u>Lack of management policies:</u>				22.063	4	0.000
Not important	1	6.4	-5.4			
Little important	2	6.4	-4.4			
Moderately important	4	6.4	-2.4			
Very important	10	6.4	3.6			
Critically important	15	6.4	8.6			
<b>Total</b>	<b>32</b>					
<u>Diversity of product lines:</u>				24.875	4	0.000
Not important	1	6.4	-5.4			
Little important	4	6.4	-2.4			
Moderately important	1	6.4	-5.4			
Very important	11	6.4	4.6			
Critically important	15	6.4	8.6			
<b>Total</b>	<b>32</b>					

**Note:** A five-point scale (1='not important' and 5='critically important')

Data had drawn from Question 70 (reasons for not adopted ABC).

<sup>a</sup> 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 6.4

<sup>b</sup> 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 10.7

<sup>c</sup> 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 8.0 At the 0.05 level of significance.

The Chi-Square of most cited reasons for not adopting ABC were 'ABC consultants very costly' (27.062), 'diversity of product lines' (24.875), 'lack of management policies' (22.063), 'lack of expertise to implement ABC' (20.813), 'difficulties in finding appropriate Arabic software package' (19.250), 'lack of top management support' (14.875), 'satisfied with the current system' (14.563), 'costly to switch to ABC' (14.563), 'lack of internal resources to install and operate' (14.563), 'resistance from employees and other management' (14.562), 'lack of awareness of ABC development' (14.250), 'ambiguity of ABC benefits in literature' (13.750), 'difficulties in selecting cost drivers' (10.500), 'difficulties in selecting appropriate English software package' (9.250), 'no intensity of competition' (9.250), 'difficulties in collecting data on the cost drivers' (8,500), 'no significant problems with current costing system' (3.813), 'higher priorities of other changes or projects' (3.813), and 'have relative small proportion of overheads in total manufacturing /service costs' (3.813).

### Concluding Comments

The survey findings reported in this paper have indicated that many organizations use simplistic product costing techniques that are likely to result in the reporting of distorted product costs. Further field study research is required to explain why simplistic techniques are used. Theory suggests that the choice of appropriate product costing techniques should be situation specific. The findings indicate that total manufacturing cost is widely used for decision-making and it is the larger, rather the smaller, organizations that tend to use variable / incremental costs. The replies were combined and analyzed to ascertain the extent to which different costs were used for either make or buy, product mix or pricing decisions (unpublished data).

The above analysis suggests that most organizations use cost information in a flexible manner and that decisions are not based solely on full cost information. A major disadvantage of the questionnaire survey method is that it cannot indicate exactly how information, of full costing cost and

of variable costing, is used for decision-making. Some organizations may use reported long-run product costs as an attention-directing mechanism for further special studies. However, the cost system must capture accurately enough the resources consumed by products because if the reported product costs are too distorted there is a danger that incorrect decisions will be made or that unprofitable products may not be highlighted for special attention. Textbooks advocate that service and support department costs such as material handling, maintenance and inspection should be allocated to production cost centers based on consumption of support department resources (Drury, 2007; Anthony et al., 2011). The support department costs are thus merged with the overheads of each production cost centre and usually allocated to products on the same basis as other cost centre overheads (normally direct labour or machine hours).

The survey findings provide strong evidence to suggest that, for many organizations, the criticism of product costing practices outlined at the start of this paper are justifiable. The majority of responding organizations (84.4 percent) specifically indicate that they use total manufacturing standard costs for decision-making. Also, a significant number of respondents (40.6 per cent) specifically indicated that they "vitaly important" use periodic profitability analysis to make key decisions. We found little evidence to suggest that inventory valuation costs were adjusted for decision-making. Direct labour-based methods were the most widely used overhead allocation bases in all production environment , and factory-wide rates were used to compute product costs for decision making.

The extensive use of full costs conflicts with theory, but the majority of organizations used both full and variable costs decision-making. Most organizations, however, used questionable overhead allocation methods that are likely to result in the reporting of distorted full product costs. The fact that information prepared for management accounting is not inherently different from the information produced for external financial reporting does not by itself indicate that product costing practices are subservient to financial accounting. The cost-benefit relationship should be considered and the use of simple techniques can be justified (Atkinson et al, 2007).

Approximately 37.5 per cent of the organizations surveyed indicated that they produced  $\geq 200$  products with a fully automated (21.9 per cent) and partially-automated (65.6 percent) and non-automated (12.5 per cent) production environment, and virtually all of them prepared internal profit statements at monthly intervals. On a cost versus benefits basis it is unlikely that a sophisticated product costing system can be justified that continuously traces the costs to many different products , as they progress through the production cycle, so that work-in-progress and finished goods inventories can be valued at monthly intervals. For decision-making, the continuous tracking of costs is unnecessary and product costs are required only at infrequent intervals. A periodic cost audit should be undertaken that more accurately measures the resources consumed by products. Palestinian manufacturing organizations ascertain the extent to which simple product costing techniques are used for a single management and financial accounting system. This situation arose because textbooks and academic research concentrated on developing sophisticated models in simplified production settings that bore little resemblance to the problems faced by practitioners (Johnson and Kaplan, 1987; Gaffikin,2006).

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