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An Investigation into the effectiveness of cost management system in large manufacturing companies of Turkey with a special emphasis on the use of activity based costing

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Abstract

Accurate and analytical cost information is vital for operational and strategic decisions in an organization. Overhead costs are one of main components of the product cost along with material cost and labour cost. Since overheads are allocated by means of simplistic cost drivers, e.g., labour hours, process time, traditional cost methods were criticised by activity based cost (ABC) supporters, claiming traditional methods were distorting the cost information. ABC and Time Driven ABC were designed and developed to provide more accurate and analytical cost information by means of appropriate cost drivers to allocate overhead costs fairly.

This study has been conducted to examine and understand the adoption and effectiveness of cost systems in publicly quoted large manufacturing companies in Turkey. In order to achieve these aims, both qualitative and quantitative methods were utilized. A questionnaire was designed and conducted to examine general characteristics of the cost system and to compare assessments of the systems that had been employed. In addition to that, an interview has conducted to obtain additional data to confirm quantitative results.

In summary, 35 individuals (organisations) have participated in the questionnaire amongst 193 manufacturing companies. Five of them have also responded to the interview questions. Fifteen responders replied that they have adopted ABC. On the other hand, 20 of the participants stated that they were still using traditional cost systems. Even though ABC users assessed their cost systems more successful for five applications, for the rest of applications (25) traditional method users assessed their system as more successful against ABC users.

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Finally, I dedicate this study to my little son **Celadet Cihan AYLUÇTARHAN**.

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1. Introduction

In order to make appropriate decisions for both operational and strategic issues, managers need both analytical and accurate cost information. Mainly, total cost information includes production cost and additional costs, e.g., sales and marketing, distribution costs, administrative expenses, research and development costs (Davies and Boczko, 2005). Among components of total costs, production cost is a primary cost. In the 1980s, Activity Based Costing (ABC) methods were introduced to provide more accurate production cost rather than using the traditional cost system. However, despite providing more accurate cost information and introducing a new version of ABC (time driven activity based costing), ABC is not used by a significant number of manufacturing companies. Latest research shows that adaptation rate is 52 % in USA (Kiani and Sangeladji, 2003), 23 % in UK (Tayles and Drury, 2001), 33.3 % in USA (Rahmouni, 2008; cited in Elhamma and Fei,2013), and research from Turkey provides data in manufacturing industry that adaptation rate is 66.6 % comparing to the other cost management systems (Karcıoğlu and Öztürk, 2012). It is suggested that implementation rates are overestimated in many surveys (Gosselin, 2007). In addition, Elhamma and Fei, (2013) claimed that adaptation of ABC is increasing.

Innes and Mitchell (1995) outlined uses of ABC as following: stock valuation, product and service pricing, output decisions, cost reductions, value added analysis, core/ support / diversionary, activity mapping, budgeting, new product or service design, customer profitability analysis, performance measurement, and cost modelling.

Gupta and Galloway (2003) proposed that an operations hexagon would show how ABC contributes towards integrating various operational decisions. This hexagon includes product planning and design, process design and

improvement, inventory management, quality management and control, capacity planning, and workforce management.

This study aims to argue about the effectiveness of cost information by analysing uses of cost methods in the decision-making processes and in other applications, at the same time it provides essential arguments around the accuracy of cost systems which will affect their effectiveness.

The result of the usage of ABC is that it gives the company the key points of accurate cost information. The aim of this paper is to examine, regardless of the fact that ABC may have been adopted, is find out whether organisations use cost information effectively or not. In addition, by means of interviews with financial managers, some additional insights may well be discovered.

The questionnaire survey and interviews

The survey was based on an questionnaire and interviews of cost management system and ABC practice in those larger manufacturing companies publicly quoted in Turkey (in total 193 companies). It was conducted by means of iSurvey (iSurvey is a survey generation and research tool for distributing online questionnaires). An initial e-mail was sent to general e-mail addresses of all companies. This mail mainly included three questions. 1- Whether they use ABC or not? 2- Do they want to participate in the questionnaire survey or not? 3- Do they also want to participate in the interview or not? After collecting initial consent of participating in the questionnaire and interview, the data was collected by means of these two research methods.

2. Literature Review

2.1. Accurate and activity based Cost Information in Support of decision making

Both at operational and strategic levels, plenty of decisions should be made in order to achieve operational outcomes and contribute to the success of strategic goals. In order to provide consistency in decisions, an overarching corporate strategy is required. Strategy can be defined as how the main objectives of the company can be accomplished. Customer demands and business conditions should be tailored in order to achieve the main objective of the organisation. Corporate strategy brings the organisation from its current position to reach their main objectives. In addition, the main objective is obtained by deploying a corporate strategy and corporate strategy requires an appropriate operations strategy (Russell and Taylor, 2011).

Operations strategy is viewed as implementation of the corporate strategy. In other words, operations strategy utilises all efforts and resources in an organisation to realize business strategy (Brown et al., 2013). These operations also have a role of delivering and driving business strategy. Appropriate operational activities can develop the organisation's capabilities such as better products, services, and faster deliveries, which gives a long-term competitive edge (Slack et al., 2001). These are all decisions, which are made during operations, to affect the overall organisation's goals by means of measuring operational outcomes such as quality, cost effectiveness, efficiency and productivity (Russell and Taylor, 2011).

Since its inception, activity based costing (ABC) has been presented and advocated as a superior method rather than a traditional methods of costing in terms of both strategic and operational decisions. Activity based costing is perceived to provide long-term accurate cost information in order to make

strategic decisions. Johnson and Kaplan (1987) criticised conventional cost systems since they do not produce long-term reliable cost information. They suggested that ABC provides this qualified information to help management take strategic decisions.

Activity based costing systems provide a helpful basis for determining operational management decisions. Cooper (1998) claims that activity based costing is an instrument of corporate strategy as it is a formal accounting system. Any of the strategic decisions cannot be made effectively without accurate cost data.

Gupta and Galloway (2003) proposed an operations hexagon, which shows how ABC contributes to integrating various operational decisions. This hexagon includes product planning and design, process design and improvement, inventory management, quality management and control, capacity planning, and workforce management. Since activity based costing is designed as a system that focuses on activities and processes and provides information on which activities consume what proportion of resources and which products utilise these activities. It provides highly efficient information based on these designations. This information can contribute to determining more profitable products, more value added activities, new product design, supplier relationships, customer satisfaction and so forth. In the frame of activity-based management, analysing activities compels managers to make and consider decisions on frequency of activities by changing some factors such as product design, product mix, outsourcing or production. Analysing activities leads to monitoring and reengineering activities and defining cost drivers, which provides a useful insight in terms of decision making. ABC does not only provide some financial data but it also goes beyond that as it analyses processes to define where value-added and non-value added activities occur. Based on this knowledge, the operations hexagon has a broad applicability to the companies' operations. ABC/M (activity based costing/management) system draws on an

inner activity based information to keep in balance operational components (See Appendix I. Operations Hexagon (Gupta and Galloway, 2003).

Based on this analysis, activity based costing might be considered as a basis for decision-making. Although, this approach does not seem to provide all significant inputs for the operational decision making process (e.g. market price, competitors), however, it can contribute to understanding the connection between ABC/M and operational decisions. Moreover, it can be useful to investigate the components of this hexagon.

Product planning and design is one of the operational areas that ABC contributes to significantly. ABC provides accurate cost information by focusing on production processes. Overhead is a main concern in this analysis. Although, direct costs are mostly being considered as the only input by designers, indirect costs (overheads) have a significant role on product designing (Uusi-Rauva and Paranko, 1997 cited in Tornberg et al. 2002). At the design stage, ABC systems help designers by giving process-based costs. Kaplan (1990) has commented that activity based cost system has an advantage of sending a specific message to product designers and engineers about developing manufacturing capacity. Moreover, since ABC provides more accurate information, it gives more relevant cost information to designers.

Since activity based costing defines activities and presents cost information insights, it helps to design and improve processes. Tornberg et al. (2000) stated that ABC calculates cost information in product structure and activities. With different process models and cost data, it is possible to estimate different alternatives to aid decision making.

Inventory management efforts involve appropriate and less inventory investment endeavours. Player and Kramer (1995) conveyed a good

implementation of activity-based costing system based on an automatic replenishment system that provided a significant amount of savings in terms of inventory investment. Kelle and Akbulut (2005) introduced ABC as the best tool in Enterprise Resource Planning (ERP) software products utilized for inventory storing cost and setup cost evaluation.

Activity-based costing can play a very important role in quality management and control. Since it analyses activities and eliminates non-value activities, it has significant impact on projects in terms of prioritization and cost justification (Schneider, 1992). ABC also helps to calculate the cost of quality (Gupta and Galloway, 2003).

Capacity planning and investment management has a function which reduces unused capacity to save resources. Activity based management monitors unused capacity by focusing upon activities. Baxendale and Gupta (1998) reported that how a small custom screen-printing company utilised ABC to find out how much unused capacity it had by examining the unused parts of activities. Capacity planning is also important in terms of joint products and outsourcing decisions. Tsai and Lai (2007) suggested a new integer of programming which consisted of a joint products decision model that maximized a firm's profit by utilising ABC. They used the model which helps making optimal decisions in terms of further processing, capacity expansion or outsourcing.

Lastly, the activity-based system is strongly related to workforce management as well. The ABC process involves significant effect on employees in a company. Since it provides a basis for analysing activities and related activities, they become more visible, which leads to more empowerment, accountability, and clear roles and responsibilities and performance measures (Turney, 1993).

In addition to the preceding approach, Innes and Mitchell (1995) outlined uses of ABC for the following purposes. Stock valuation, product and service pricing, output decisions, cost reductions, value added analysis, core/ support / diversionary, activity mapping, budgeting, new product or service design, customer profitability analysis, performance measurement, and cost modelling.

2.2. What is Cost and what is the cost concept for Accounting Theory and Business Management

In the context of accounting classification, cost can be classified into two major classes in terms of manufacturing industry: manufacturing and non-manufacturing cost. Manufacturing cost can be classified as direct material costs, direct labour costs and factory overhead costs. The term “direct” represents that these costs can be directly associated with production of the product i.e. as volume of production increases these costs rise and therefore they are variable. Factory overhead costs include all other production costs except direct costs. These costs are components of manufacturing cost and their function is that they transform raw materials to finished goods. When the products are sold, the manufacturing costs are part of the total cost of sale and impacts upon the trade profit shown on income statement. On the other hand, non-manufacturing costs are the costs that include administrative and marketing costs. These costs are perceived as periodical costs rather than production costs. In other words, they do not necessarily associate with production costs and are shown separately on the income statement to reach net income (Glautier and Underdown, 2001).

In the practice of financial reporting, non-manufacturing costs are considered and reported separately from production costs. According to UK-based accounting standards (UK GAAP), as a principle, non- manufacturing costs should be excluded from stock valuation, therefore, from costs of sales. However, a related standard (SSAP 9) has some further exemptions. For

instance, it allows the allocation of management-costs to be divided somewhat to production and other functions. This aids small companies which have no certain distinction between management accounting and financial accounting. When the production cost is separated from periodical cost (i.e. manufacturing – nonmanufacturing cost), the allocation of overhead becomes an issue. SSAP requires that overhead costs should be assigned on the basis of normal production level. IFRS (International Financial Reporting Standards) regulates the issue in a similar way. The standard (IAS 2) requires that allocation of fixed overhead costs should be allocated based on normal capacity (Ernst & Young, 2001).

While for financial accounting purposes only, manufacturing costs are assigned to products, when it comes to decision making, non-manufacturing costs are very important. Thus, it may be necessary to assign non-manufacturing costs to products in order to make business decisions (Drury, 2013). Porter (1985) argued that in general cost studies there is a temptation to focus only upon manufacturing cost and overlook non-manufacturing costs such as marketing and service costs. He also argued that these studies analyse the cost of activities individually, therefore, they do not recognise the connections among activities which affect cost. Accordingly, that will cause great difficulty to assess a competitors cost position and their own positions relatively.

Cooper and Kaplan (1988) have argued that since ABC exists to support the production, not simple product cost, the entire costs involved within an organisation should be considered as cost of production. These costs include logistics, production, marketing and sales, distribution, service, technology, financial administration, information resources and general administration. This approach is introduced in the concept of activity based costing.

In this context, the ABC approach can be considered as total costing. In the marketing area as a pricing concept, cost is considered as a total concept which

may include research and development costs, distribution costs and so forth (Dibb et al., 2012).

2.3. From Traditional Cost Method to ABC Cost Method

As mentioned in the preceding chapter, overheads are residual costs on the production cost and they are not directly associated with individual products. Therefore, it is required to find a method of fair allocation so as to generate comprehensive unit product cost information. In the organisation, the unit cost information is necessary for many reasons, e.g., planning and decision-making (Innes and Mitchell, 1993).

Traditional cost systems have two stages to assign costs to the products. Firstly, all costs are gathered in production departments (from all the other service and production departments to main production departments). Secondly, costs are allocated to products from these departments (Kaplan and Atkinson, 1998). In this stage, production overheads are attributed to production outputs by application of overhead rates. In addition to production costs, non-production overheads have been treated as a single cost pool and allocated by a general overhead rate in a traditional approach.

Traditional cost accounting systems allocate overheads by using simplistic measurements such as direct labours, machine hours or processing time (Cooper, 1998). In the last quarter of the twentieth century, overhead costs became much more significant in the total cost of production. Miller and Vollmann (1985) reported that manufacturing companies especially those in the electronics and mechanical equipment (machinery) industries are facing high manufacturing overheads. Their data suggests that in US industry, overhead costs compose 35% of total costs. For Japanese products, this rate is 26%.

These rates are particularly high in the electronics and machinery industries, which result in 70 to 75% of value added in USA and 50 to 60% of value added in Japan. By the process of automation within manufacturing, labour costs have fallen and overheads costs have increased in order to maintain and run the automated equipment. High-volume standardized products by highly automated processes have caused notably greater overhead costs rate in total costs.

In traditional cost systems, managers have insufficient information and lack confidence to manage these costs. They have less awareness of the real drivers of overhead costs and therefore cannot control them. The problem with the traditional approach is that the drivers behind overhead costs are not always labour or machine hours. Many managers who use traditional cost systems are aware of distortion in product costs and they use some informal ways to compensate that (Cooper and Kaplan, 1988).

Besides, there are much customised and diversified products and product lines on offer now. Thus, accurate cost information is vital in the current severe competitive environment (Cooper and Kaplan, 1988).

Due to overhead cost calculation and distribution factors, cost information is incorrect, especially in multi-product companies. Internal orientation of cost information is too limited for strategic decision-making (Clarke, 1995). Cooper (1998) has illustrated distortion of cost data with the production of different types of ballpoint pens. Accordingly the plant which produces multiple pens uses a simplistic way (e.g. direct labour hours) to assign overheads (such as scheduling, machine setup, order shipment, and reworking defective items) to products. Even though comparing to high-volume products, low-volume products have more share from real overhead activities (e.g. packaging, shipping, ordering), when simplified methods are employed, they consume less overhead per unit or vice-versa, i.e. high-volume products actually have less

share from real overheads, however, in traditional methods' calculation, they includes more overhead costs. Thus, if product strategy is designed based on this cost information, the result will be flawed and could lead to disaster for the company.

Based on previous studies, the main criticisms of traditional cost methods are articulated below (Drury and Tayles, 1994):

- Due to over-simplified methods (i.e. volume drivers such as direct labour hours) in computing, product costs are distorted.
- Direct labour-based overhead allocation is used in automated and machine-based manufacturing companies, which may lead a huge distortion in cost.
- With the impact of external financial reporting, product costing practices follow financial accounting mentality. However, product costing has a wider function than inventory valuation in terms of decision-making.

Activity based costing methods have been developed as an alternative approach to the traditional approach.

2.4. What is Activity based costing

Activity based costing is considered as one of most important innovative developments in management accounting in the twentieth century along with the balanced scorecard, variance analysis, and return on investment (Gosselin, 2007). While the basic concept of activity based costing has existed in literature for some time, it is attributed to Staubus (1971) who actually coined the phrase and outlined ABC's main structure for the first time. As a result, ABC was adopted later on in the 1980s within operations by American accountants in

large American companies. After these developments, two academicians Robin Cooper and Robert Kaplan from Harvard University were credited as the people who composed a more coherent framework (Innes and Mithcell, 1993).

Turney (1996) defined ABC as a method of measuring cost and performance of activities and cost objects. ABC allocates costs to activities, based on their use of resources and then assigns these costs to production based on their use of activities.

According to Hilton (2005), ‘‘ABC is a two-stage procedure used to assign overhead costs to products and services produced. In the first stage, significant activities are identified, and overhead costs are assigned to activity cost pools in accordance with the way the resources are consumed by the activities. In the second stage, the overhead costs are allocated from each activity cost pool to each product line in proportion to the amount of the cost driver consumed by the product line’’.

2.5. How ABC system provides more accurate cost information

The main nuance of activity based costing is that the system mainly provides more accurate cost information by applying a more appropriate method of overhead-distribution.

Activity based costing allocates overheads through activities. The philosophy behind ABC is mainly that activities consume resources and products consume activities. Innes and Mitchell (1993) associated this activity basis with Miller and Vollman’s (1985) “hidden factory”. Miller and Vollman (1985) defined these activities as transactions which any organisation implements. While generally direct labour and direct materials are considered as main parts of

manufacturing, real driving forces come from transactions which also drive overhead costs. Miller and Vollman's (1985) defined four basic types of transactions.

- Logistic transactions (movement of production materials through one location to another including receiving, expediting, shipping and so forth);
- Balancing transactions (matching demand requirements with the supplies of labour, materials and capacity such as purchasing, material planning etc.);
- Quality transactions (ensuring output specifications to meet expectations);
- Change transactions (transactions which enable basic manufacturing information systems to change engineering designs, schedules, routing, standards etc. to meet changes in customer needs).

Innes and Mitchell (1993) have explained ABC stages as based on notion of activities. Accordingly, ABC includes two main stages. The first stage is pooling of the overhead costs as activity costs. These activities may not match formal departmental boundaries as they represent real happenings in a company. The second stage is allocating these costs to production output.

In order to realize the first stage, activities are defined; activities are all the actions which are performed to convert inputs to outputs. Defining these activities is an attempt for analysing what is going on within the organisation. Therefore, this stage will be achieved by consulting with staff, especially line workers within the organisation. For instance, some activities can be defined as set up, maintenance, purchasing, production control. Purchasing activity can also be subdivided as sub activities as supplier vetting, preparing purchase agreements, supplier liaison, order processing, order expediting. After pooling all overhead costs in activities by means of resource drivers, which assign

resources to activities, these activity costs will be assigned to products (also services, any cost objects) by cost drivers. Some examples of cost drivers are given below (Innes and Mitchell, 1993).

Table 1- Activities and cost drivers

Activity	Costs Driver
Material Procurement	No. of Purchase Orders
Material Handling	No. of Movements
Quality Control	No. of Inspections
Engineering Services	No. of Change Orders
Maintenance	No. of Breakdowns
Line Set-up	No. of set-ups

Kaplan and Atkinson (1998) classify activities in three stages. Accordingly, unit level-activities are activities which are performed for every unit. For these activities, traditional drivers can be utilized (e.g. labour hours, machine hours). There are batch-level activities in the second stage of this activity hierarchy. Since these activities are not directly related to units of products, they are instead related to batch of products (e.g. setup machines, purchase orders); these are considered as fixed costs by the traditional approach. According to the ABC approach, these activities are also assigned to products via activity drivers. The third stage is product sustaining and activities-customer sustaining activities. These activities can be exemplified as maintaining and updating product specifications, market research and support. These activities are also allocated to the products.

2.6. From ABC to ABM

Activity based costing is primarily used in terms of some decision-making patterns such as pricing, product mix and product sourcing. Then increased knowledge in activity analysis and cost drivers has enabled companies to

analyse and redesign their business processes to eliminate non-value added activities or improve them (Keegan and Eiler, 1994 cited in Gupta and Galloway, 2003).

Activity based management utilizes information from activities and cost drivers which can create further management implications. Hilton (2005) defined Activity Based Management as: ‘‘Using an activity based costing system to improve the operations of organisation”. ABM is going beyond costing technique per se to focus on activity analysis and cost drivers. While ABC generates more accurate cost information, ABM utilizes activity analysis to contribute understanding towards the objectives of an organisation and implementing all processes in the organisation to reach these objectives (Gosselin, 2007).

Turney (1992) states that ABM obtains data from ABC, while activity based costing follows the resources-activities-cost objects path, activity based management focuses on cost drivers and activities to reach performance measures. This structure provides useful insights for decision-making within an organisation. From a customer’s perspective, ABM analyses the cost of servicing each customer or customer segment. Beyond simple cost information, ABM puts revenue in an equation to reach ABM product contribution (cited in Gupta and Galloway, 2003).

2.7. From ABC to Time – Driven ABC

In traditional costing method, some simplistic ways (e.g. direct labour hours and machine hours) are used to allocate all overheads (Cooper, 1998). As an alternative approach, ABC suggests ways to define activities and to assign activity costs via measurement of performance times of these activities. Time-

driven ABC is a new version of ABC, which has been improved to correct the inadequacies of ABC.

Kaplan and Anderson (2004) highlighted inadequacies of activity based costing and they suggested a new version of ABC as time-driven activity based costing. They discussed essential shortcomings as follows:

- Implementing ABC for company-wide application is very hard and expensive,
- Data collection is time consuming and the data is biased, since time allocation of workers is taken from them by interviews and surveys (i.e., employees will not report the exact amount of idle time or unused time).
- Due to cost, many ABC implementations are outdated since they are not being updated frequently,
- Cost drivers are also not objective and homogenous, since a general, accurate and objective measurement (e.g. time) is not used instead, cost drivers are used which are based upon the number of performing times of each activity (e.g. number of setups, number of shipments).

Time driven ABC uses “time required to perform a transactional activity” to allocate activity cost to products, instead of the number of performing times.

Time driven ABC, first differentiates the theoretical and practical capacity of a company. Because of some interruptions and malfunctions, employees and machines will work at less than their theoretical capacity. Thus, time-driven ABC after starting by defining activities, estimates practical capacity of the organisation and by using this practical capacity and performance times, it assigns recourse costs to products.

Kaplan and Anderson (2004) suggested that this approach provides more accurate and analytical cost information, time based activity cost drivers can be updated easily and quickly. They articulated the positive specifications of time-driven ABC as following below:

1. Easy and fast to implement,
2. Integrates well with the data now available from recently installed ERP and CRM Systems,
3. Inexpensive and fast to maintain and update,
4. Ability to scale to enterprise-wide models,
5. Easy to incorporates specific features for particular orders, processes, suppliers and customers,
6. More visibility to process efficiencies and capacity utilization
7. Ability to forecast future resource demands based on predicted order quantities and complexity.

2.8. Discussions on ABC

While Activity based costing is perceived as one of the most significant innovative management accounting methods that provides more accurate cost information and activity analysis by means of particular way of assigning overhead to product cost, there are still many evaluative discussions taking place.

Despite the fact that ABC/M has made a significant contribution to management and it has attractive implications and provides relevant information in terms of decision-making, there are strong arguments against using this conceptual framework and there is much impracticality in terms of its implementation.

In a previous broad study, Cobb et al. (1992) mainly focussed on the problems which are associated with ABC. The study findings shows that activity based costing systems are utilized for two different functions: product costing and cost management.

The problems of ABC were identified as perceived areas of concern to companies, which were considering ABC implementation, those firms that rejected ABC, and those implementing ABC. According to the study, the most common problems of ABC are articulated below:

- The amount of resource required;
- Accurate data collection (especially gathering data on cost drivers);
- Coping with fact that activities cross existing departmental boundaries and areas of responsibility;
- The fact that other changes were given a higher priority within the organisation;
- The heavy demands made by ABC design and implementation on an accountants' time.

When this reasoning is evaluated, expect resistance against change, the main problems appear as the required resources and complexity of the system.

In one of the latest studies, Suthummanon S. et al. (2011) gives results of a case study and it was confirmed that ABC provides more accurate cost information compared to the traditional cost system. It gives an insight into product cost structure. Through this information, it is found that ABC contributes extensively in terms of cost reduction. On the other hand, S. Suthummanon et al. (2011) admitted that ABC requires too much time, participation from every unit of the organisation and it is a labour intensive process. They also drew attention to the fact that resistance from individuals and managers occurred

against the introduction of ABC. Overall, they acknowledged that ABC contributes to an organisation significantly in terms of decision making.

Beyond the practicality of the system, it seems it would be wrong to claim that ABC generates totally accurate cost information. Innes and Mitchell (1993) acknowledged that due to complexity of products and services, it is not possible to develop a system that provides wholly accurate cost information. On the other hand, they suggest that ABC is still the best available approach for full absorption costing.

While products and services reflect more accurate information in the ABC system, still both costs and benefits of the system should be considered in comparison with other systems. Drury (2013) compares the ABC system with direct costing (the system that only focuses on direct costs) and traditional systems. Accordingly, ABC is too costly to implement. Particularly, for small companies the traditional system is very easy and available at a lower cost when training and software requirements are considered. However, traditional cost systems give distorted cost information. The limitation is that direct cost methods give only partial cost information. Therefore, when deciding to operate one of these systems, implementation costs of ABC should be compared to the cost of having distorted and partial information. This may result in significant mistakes in terms of decision-making. For instance, continue selling unprofitable products.

Drury (2013) suggests simplistic traditional systems will work under following conditions:

- low levels of competition,
- when non-volume related indirect costs are low in total indirect costs,
- since products are standardised, they consume similar proportion of resources (i.e. low product diversity),

In contrast, the ABC system should be implemented under the following circumstances:

- intensive competition,
- non-volume related indirect costs have high level of proportion in total indirect costs,
- where different types of products consume significantly different proportions of resources in an organisation (i.e. high product diversity).

Kaplan and Atkinson (1998) considered designing the optimal system by defending the ABC system against claims that it is complex and expensive. Contrary to Drury (2013), Kaplan and Atkinson suggested that it was better to make the decision between a more sophisticated ABC and an essential type of ABC rather than using a traditional cost system. An ABC system is good for tracing any underlying economic event by means of cost drivers. For example, it traces back set-up costs, which are assigned on the basis of setup performed for individual products. It is possible to design an ABC system which utilizes, estimates and therefore, reduces the number of activities. Since therefore, the system design can be less expensive and can provide information which is very close to giving precise information. Designing an ABC, which includes 1000 activities and directly charging actual resources to every product through each performed activities in an organisation, would provide most accurate information but it would also be unreasonably costly. A balanced approach should reflect the best cost system which balances the cost of errors and cost of measurement. On the other hand, a traditional cost system is inexpensive to implement but it can result in large distortions eventually in product and service costs. Therefore, designing an optimal ABC system would greatly enhance benefit of decisions in an organisation.

2.9. ABC performance and effectiveness of the system

After discussions on the advantages and disadvantages of ABC systems, the purpose of this study is to measure the effectiveness of the cost management system and the use of ABC by evaluating the:

- ABC paradox
- Application of ABC
- Success of the ABC

Although ABC was developed a considerable time ago, and recognizing that it provides analytical and accurate cost information, many surveys showed that the diffusion of ABC has not been as high as may have been expected. This situation is called the ABC paradox (Gosselin, 1997). Since the beginning of the 1990s, many surveys have been conducted on the adaptation rate of ABC and reasons behind that rate of adoption. Some results can be highlighted here. In America a large survey, which was conducted across 2,500 American firms in 1991, concluded that adaptation rate was 23% (National Association of Accountants, 1991). The other surveys that were conducted in America showed that adaptation rate was 27 % (IMA, 1993).

Moreover, some previous studies, which have been conducted in UK, showed that adaptation rate was 10 % (Innes and Mitchell, 1991), 4% (Drury and Tayles, 1994), 20% (Innes and Mitchell, 1995), 18% (Innes and Mitchell, 2000) and one of latest study resulted in a 14% adaptation rate (Al-Sayed, 2011) “still in process of implementation”.

Latest research showed that adaptation rate is 52% in the USA (Kiani and Sangeladji, 2003), 33.3% in USA (Rahmouni, 2008), 23% in UK (Tayles and Drury, 2001), 14% in UK (Al-Sayed, 2011) “still in process of implementation”.

In addition, research from Turkey provides data in manufacturing industry that adaptation rate is 66.6% compared to the other cost management systems (Karcıoğlu and Öztürk, 2012). It can be seen that the adoption of ABC is increasing (Elhamma and Fei, 2013).

Gosselin (2007) suggested that results of surveys should be taken cautiously since the definition of ABC varies and it is not clear. Moreover, there may be overestimation in many surveys in terms of implementation rate. The survey, which was conducted in Turkey, showed a very high implementation rate. This study included 143 companies (publicly quoted manufacturing companies) as main population, 87 responses (61%), and 58 companies which were implementing ABC. In the study, the total number of companies, which implemented the all cost methods, was 187. This result is explained because these companies were using more than one costing method at the same time (e.g. target costing, kaizen costing). Despite this explanation, this result should be considered cautiously. Even the authors of this study expressed a probability of some respondents which did not reflect the truth (Karcıoğlu and Öztürk, 2012).

Two of those above studies can be very helpful to draw a framework for this study. Innes and Mitchell (1995) and Innes et al. (2000) conducted two follow up surveys of activity based costing in the U.K.'s 1,000 largest companies. Main findings of these surveys are adaptation rate of ABC, specific application of ABC and the view of participants on success and importance of ABC.

In the survey some potential uses of ABC was used based on related literature

- stock valuation,
- product or service pricing,
- output decisions (e.g. product range, component subcontracting),

- cost reductions,

- value added analysis (identifying non-value added activities),

- core/ support/ diversionary (giving priority to core activities rather than the other ones),

- activity mapping (ABC shows flow of activities and duration),

- budgeting,

- new product or service design,

- performance measurement,

- cost modelling,

- customer profitability analysis.

These surveys showed that appraisal of ABC success in a UK context assessed positively. Overall success of ABC was rated as 3.9 by the 1999 surveys participants, and 3.8 by the 1994 surveys participants (on average rate - from a 5-point scale). In the 1994 survey, the most significant factors behind this success were rated as budgeting, cost modelling, cost reduction, cost management, and activity performance measurement and improvement. In the 1999-associated survey, this success varied significantly with new products or service designs, customer profitability, cost reduction, cost management, cost modelling, and activity performance measurement and improvement (Innes et al., 2000). These findings showed not only that ABC implementation benefit is higher than its cost, but also showed cost information is considered to be used effectively in implementation of the ABC.

3. Research Frameworks, Methodology and the Survey

3.1. Research Frameworks, Methodology

The object of this research is investigating the effectiveness of cost management system in large manufacturing companies of Turkey. Since ABC (activity based costing) is suggested and subjected in many studies as providing the most accurate information, this study has a special emphasis on use of activity based costing. In the literature review, main concepts of cost issues and activity based costing have been reviewed. Following that, this study will engage in:

- identifying cost system of population of this study,
- investigating effectiveness of costing methods based on how successfully they use costing system for purposes of usage of costing methods,
- assessing adoption of activity based costing.

To accomplish the above issues, a survey was conducted which allowed sufficient data to be collected in an economical way. Both quantitative and qualitative methods were primarily utilized in this study. For the quantitative part, a questionnaire was employed to collect data on general information of costing methods' implementation. The information, which is gathered by questionnaire, is limited both in terms of depth and quality. This research, therefore, aims to utilize both the questionnaire and interview. Greener (2008) suggested that using multiple methods to collect data in business researches would enhance and confirm the results that are reached at the end. Tashakkori and Teddlie (2003) discussed that a combination of methods is useful since it gives an opportunity to answer research questions in a better way and to have better findings and interferences (Cited in Saunder et al, 2009). In order to support and detail the questionnaire results, a qualitative method, interview,

was conducted in this study to search for more detail and further understand the results of the questionnaire. Saunder et al (2009) indicates that interviews provide an opportunity to look at the reasons behind what appears to be fact.

Quantitative data, which was collected, has been analysed quantitatively using descriptive and inferential statistics. Besides this, a few causal relationships among the factors present were highlighted. Along with these primary data sources, some previous studies (e.g. Karcıoğlu and Öztürk, 2012; Innes and Mitchell,1995) findings were used as secondary data as a comparator with this study's findings.

Participants of this survey are managers of accounting departments of publicly quoted manufacturing companies in Turkey. By August 2014, there were 193 publicly quoted manufacturing companies. Distribution in subcategories are as follows:

Table 2- Distribution of publicly quoted manufacturing companies in Turkey

Subcategory	Number
Food, Beverage and Tobacco	30
Textile, Wearing Apparel and Leather	27
Wood Products Including Furniture	4
Paper and Paper Products, Printing and Publishing	17
Chemicals, Petroleum Rubber and Plastic Products	34
Non-metallic Mineral Products	29
Basic Metal Industries	17
Fabricated Metal Products, Machinery and Equipment	31
Other Manufacturing Industry	4
Total	193

This survey applied to publicly quoted manufacturing companies' managers because these companies are perceived to have a more organised structure

and procedures, and are more likely to have considered adopting modern managerial accounting methods. The same population sample of survey was applied to that used by a previous research (i.e. Karcıoğlu and Öztürk, 2012). As a result, this study is a follow up study in regard to design of some questions in the questionnaire. Consequently, this situation provided an opportunity to compare the findings within the two studies. The surveys strategy was to reach full population of the survey like the previous survey.

To collect data and provide sufficient participation the following steps were taken.

Step 1 - An initial e-mail was sent to all companies, which were offering to participate with this survey, by using general e-mail addresses on a public disclosure platform (Public Disclosure Platform (PDP). This is an electronic system through which electronically signed notifications required by the capital markets and Borsa Istanbul regulations are publicly disclosed) (http://www.kap.gov.tr/en/home.aspx).

This mail mainly included three questions.

1- Whether they use ABC or not?

2- Do they want to join the questionnaire survey or not?

3- Do they also want to join an interview or not?

Step 2 - The same e-mail was sent to all managers of accounting departments by using their specific e-mail addresses.

Step 3 - All companies were called one by one (their accounting departments) to offer them the chance to participate in the survey.

Step 4 - A reminder for filling out the questionnaire was sent as an e-mail to all managers of accounting departments by using their specific e-mail addresses.

Since the population of the survey is composed of larger manufacturing companies from all over Turkey, their headquarters are in different areas in Turkey. Therefore, due to time and traveling limitations, the survey was from long distances via internet. This resulted in 35 individuals from all the population answering the questionnaire and five of them agreeing to be interviewed.

As all the participants are manufacturing companies, considering they probably deliver some services business as well, questions were designed taking this into account. In addition, the survey attempted to find out usage situation of “time-driven ABC” as a cost calculation method.

3.1.1. Questionnaire

The questionnaire is composed of five parts. In the first part, some general information about organisational structure and the profile of responder is established. In the second part, the costing method of organisation is being identified by questions asked. In the third part, a general question takes place which aims to get information about general satisfaction from the costing method. The question requires responders to rate their overall satisfaction on their cost management system including 5 likert scale multiple answer, where 1 is very unsuccessful and 5 is very successful, which presents their attitude to the issue. In the fourth part, the effectiveness of the costing method is being measured by asking questions based on usage purposes of the costing method. Proportion of the success was used as main measurement to value their costing systems. In the last part, some additional questions take place which aim to obtain more information about ABC implementation.

At designing stage a couple of previous studies were utilized to design the questionnaire (i.e. Karcıoğlu and Öztürk, 2012; Innes and Mitchell 1995) which would provide comparable data and a better academic basis.

After designing the questionnaire, it was translated into Turkish. The Turkish version was assessed by two academicians. It was also sent to two accountants for pilot testing (See Appendix II English and Turkish Versions of the Questionnaire).

After all these efforts, the questionnaire was transferred to isurvey.soton.ac.uk and was sent to companies via e-mail.

3.1.2. Interview

For interviews via Skype or in written form, the first question was to describe if companies costing methods have been distorting cost information or not. In other words, are they very satisfied with their current costing method or not. Second question was whether they have any plan or action to take to adopt any other costing method including ABC so that they have more accurate costing information in order to make better decisions in both the operational and strategic areas. Third question was that have they made any decision about choosing any costing method in the past and what their main reasons for taking the decision were. The last question was to establish if they believe that they can obtain accurate and analytical cost information by making change in their costing system or that it is only a matter of additional effort to try to get better results by using the current costing method all the time. Since questions had been sent in advance, all interviewees seemed well prepared for interviews; therefore, it is felt that their answers were genuine.

There were five participants that had attended this interview. All their answers can be found on appendix (See Appendix III English and Turkish Versions of the Interview Questions and Appendix IV Interview Answers).

4. Results

The results will be presented under two titles: the responses to the survey and the findings of the survey.

The findings of the survey to some extent will also be presented in comparison with previous studies which have similar questions and have been applied to a similar population (i.e. Karcıoğlu and Öztürk, 2012; Innes and Mitchell, 1995; Innes and Mitchell, Sinclair, 2000).

4.1. The Survey Responses

After mailing related e-mails to 193 larger companies twice and calling every company, a total response of 16% was obtained (n=31). Meanwhile when conducting this survey, some reasons for not participating or not answering the survey were learned from company officers:

- The primary concern of companies was that because of being a publicly quoted company, it would be disadvantageous to share any information. When calling their officers these concerns were made implicitly.

- Another concern was that companies who responded to the invitation said that they were too busy to allocate time to participate in any survey.

This situation forced the author of this study to design a simpler questionnaire.

- Some companies had ended their production activities.

- One company replied to the invitation by saying that in their industry (petrol refinery) they cannot get exact cost information so that they do not use cost information in any case, instead they use market prices to determine their product prices. Moreover, another company replied stating they were in the process of privatisation and due to restructuring, they could not participate in this study.

The obtained surveys responses' analysis can be summarised as follow.

Usable responses: 35, Blank questionnaires (attempted but not completed): 157, Total: 188.

4.2. Findings

The questionnaire comprises of five parts. These parts are going to be along with interview answers as follows.

Organisational Structure and Profile of Responders

In the questionnaire, the first set of questions includes queries about current activities of the organisations, total employee numbers and last year's annual sales. These replies will be evaluated in order to examine the relationship

between the organisational structure and adoption of an activity based system. This part of questionnaire also aims to ensure the responder is the correct person to confirm the quality of given information. These questions, therefore, ask about the occupation of responder in the firm and how long s/he has been employed in the current position.

Industrial distribution of the participated organisation varies. Total set of participants are extended across all main sectors. The distribution is listed in the below table.

Table 3 Sector distribution of Surveys Participants

Subcategory	Number
Food, Beverage and Tobacco	9
Textile, Wearing Apparel and Leather	3
Wood Products Including Furniture	2
Paper and Paper Products, Printing and Publishing	2
Chemicals, Petroleum Rubber and Plastic Products	8
Non-metallic Mineral Products	2
Basic Metal Industries	3
Fabricated Metal Products, Machinery and Equipment	3
Other Manufacturing Industry	3
Total	35

Average annual sales of companies which participated in the survey was found as ₺952,856,359.70 (£266,803,592.14)[1] and average number of employees found as 1717 employees.

[1] 1.00 TRY = 0.280004 GBP (27.08.2014)

Table 4- Sme/Nonsme- Abc/Traditional Users

Size	ABC users		Traditional users		Total	
	n	%	n	%	n	%
NONSME companies	12	44.4	15	55.6	27	100
SME companies	3	37.5	5	62.5	8	100
Total	15	42.9	20	57.1	35	100

When the relationship between ABC adoption and the size of companies is examined, a significant proportion was found showing that company size is a significant factor in terms of ABC adoption in larger companies in Turkey (chi square 0.527 significant at the 5% level) (See Appendix V Chi Square Tests). Company size factors analysed as SME size and Non-SME companies. Total non-SME companies (larger) comprised of 44.4% (n =12) ABC users and 55.6% (n=15) traditional methods users. On the other hand, total SME companies comprised of 37.5% (n=3) and 62.5% (n=5) traditional methods users (Table-4).

Industrial distribution of ABC adoption showed as follows: Food, Beverage and Tobacco (n=3), Textile, Wearing Apparel and Leather (n=4), Chemicals, Petroleum Rubber and Plastic Products (n=3), Non-metallic Mineral Products (n=3) and Fabricated Metals (n=2).

Respondents of the questionnaire were general accounting department managers and financial directors (28 responders). The remainders were also working accounting departments of the companies (7 responders). They were in general well-experienced accountants in the company, averaging 6 years of employment within the company.

Adopted Costing Methods and ABC Adoption

In the second part of the questionnaire, the costing method of organisation is attempted to be identified by questions asked. This part involved a question about allocation methods of overheads to the products, aiming to distinguish traditional costing methods users and activity based costing users. To support this question, a brief description is required for current costing method. In addition to that, the duration of the usage of current method is also requested. Any additional costing methods, which are being used along with the main costing method, are also identified. Another important question which is included in the questionnaire is about estimation of average proportion of overhead cost in product cost. This question is very significant, because as it is highlighted within the literature review, the primary reason of distortion of costing information is the increasing proportion of overheads. Since overheads are indirect costs, they need to be assigned to production. Therefore, simplistic ways are used in traditional methods (e.g. labour hours, machine hours); this distribution causes huge distortion in product costs. The main argument of activity based costing methods is to prevent this distortion. The last questions in this part aim to make clear the reason for usage or rejection of ABC.

According to the questions which are related to overheads allocations and description of the current cost method, the majority of responders are composed of users employing traditional methods (57% of all organisations, n=20). These adopted traditional methods are labour hours (38%, n=8), machine hours (24%, n= 5), and of them use process time (19% of (n=4), labour and material costs (19% of (n=4). Interestingly, several of them use more than one traditional costing method to assign overheads to production.

On the other hand, only 43% of (n=15) responders of the survey had adopted ABC (or Time Driven ABC). Most of non-ABC users have not done any assessment on ABC adopting until now, 60% of (n=12) them. While 20% of

(n=4) them have been considering adopting ABC, 10% of (n=2) them have rejected ABC adoption after an assessment (two of them did not respond). Those organisations which have not considered or rejected ABC adoption mostly have reasoned that it is not appropriate for their type of business (n= 8). The other reasons for not adopting ABC were that it requires high level of resource to design, initiate and implement it (n=5), lack of sufficient benefit comparing to its cost (n=3), and resistance of employees (n=1) (two of them did not respond to this question).

ABC adoption that was revealed in this study is lower than that found in a preceding Turkey survey. In previous study, Karcıoğlu and Öztürk (2012) found this rate was 66.6% (n= 58).

The relationship between ABC adoption and size of companies is examined by using their turnover and labour numbers. This is according to the official definition in Turkey made by KOSGEB (Small and Medium Sized Enterprises Development and Support Office). According to relevant regulation, firms employing less than 250 employees or whose net annual sales (both tax and financial purposed financial statements' number) is less than 40 million TL are regarded as SME. When the companies are classified in this respect, 23% of (n=8) of the companies are SME and 77% of (n=27) of the companies are non-SME companies.

In this respect, the size of companies is also measured since it has statistically significant effect on ABC usage. When ABC users were examined in terms of sectors, the results shows that there was no correlation between the types of industries and the tendency to adopt ABC.

More about architecture of Costing Methods adopted in the Organisations

When the question which required a brief description for costing method the companies adopted is considered, it gave further explanation and good justification for the costing method they were applying to. Although there were a few improper answers such as “according to tax regulations” or “according to accounting standards”, in general the answers provided a general framework for calculation of cost components of the products. The answers also confirm the information about distribution of overheads by using traditional costing methods. Moreover, this question helped figure out the real costing method of three organisations. While two of them claimed that they have adopted the ABC method, it was revealed that they were using traditional methods still since they were using same simplistic driver to assign all overhead costs. On the other hand, one description of costing method showed that they were actually using all types of ABC components such as defining activities, cost drivers and utilizing these cost drivers to allocate all overhead costs.

According to the survey’s findings, larger Turkish manufacturing companies have been dealing with production activities for a long time (averaging 49 years). The findings also showed that the duration of using same costing method is very long (averaging 15 years).

Responders of the survey have also been using some additional modern costing methods along with their current costing methods (kaizen costing n=2, target costing n=5, quality cost system n=2, just-in-time costing n=2, product life cycle costing n= 1).

Both traditional costing and activity based costing methods users were asked about estimation of the average proportion of overhead cost in product cost.

The findings showed that there is an important rate of overhead costs in total product costs which require proper distribution methods to reach more accurate cost information (averaging 22% of the product) (ABC users: 31% - Traditional Method users: 17%). This rate also points out the main argument of the ABC since the method is suggested as providing more appropriate cost drivers to distribute overheads somewhat.

More about ABC usage in the organizations

In the last part of the questionnaire, some additional questions take place which aim to obtain more information about ABC implementation. These include if they have adopted ABC (or time driven ABC), what is the stage of adaptation; what is usage type of ABC (or time driven ABC); to what extend do top management support adoption of ABC; and what is the main positive benefit of ABC.

According to the answers, ABC users showed different stages of adoption. Ten ABC users have adopted ABC for all the applicable parts of the organisation, while three of them applied ABC to only a few applicable parts and two of them applied to the most applicable parts of the organisation. Only seven ABC users responded that ABC has replaced the previous costing system. Six of them responded that ABC was being used in parallel with the previous costing system. The other two ABC users replied that ABC was considered only to be in an early pilot testing form. The “To what extent do top management support adoption of ABC?” question was answered by seven of them as “neutral”, by three of them as “fairly weak”, by two of them as “fairly strong” and by two ABC user as “very strong” and by 1 ABC user as “very weak”. Only five of the ABC users responded that they redesigned their organisational structure to match ABC system. Finally, the main positive benefit of ABC was mostly answered as “refining product cost to improve profit analyses of individual product lines” (n=7), “visibility and scope in for resource consumption” (n=3), contributing to

customer and market profitability analysis (n=2), “It aids price decisions” (n=2), “It can improve performance in activities which become the focus of the system” (n=1).

Uses Purposes and effectiveness Costing Methods

In the third part of the questionnaire, a general question takes place which aims to get information about general satisfaction from the costing method.

When traditional method users and ABC users are considered separately, traditional method users rated their overall satisfaction from the cost management system as 3.75 over 5 on average (Standard Deviation – SD=1.0699). ABC users rated overall experience with ABC as 3.73 (SD=0.5936) over five on average.

Innes et. al. (2000) presented overall success of ABC in two follow up studies as 3.8 over 5 (SD= 0.7) (1994), 3.9 over 5 (SD= 0.8) (1999).

In the fourth part of the questionnaire, the effectiveness of the costing method is aimed to be measured by asking questions based on usage purposes of the costing method (i.e. rational of uses). These questions point out to the rational for operational and strategic decisions. The main queries in this part are about, stock valuation, product/service pricing, product/service output decisions, cost reduction, budgeting, capacity planning, new product/ service design and planning, process design and improvement, customer profitability analysis, and activity performance measurement/ improvement.

Even though ABC adopters in this survey's responders are very few, abovementioned decision types and the other applications were asked about from the responders to grade so that it would provide a convenient basis to compare both traditional and activity based costing approaches in terms of effectiveness.

a) Stock valuation

Stock valuation is one of primary usage types of the costing method. This application was generally viewed as fairly successful and neutral by all responders. Only a few of responders viewed this usage as very successful and one of them viewed as very unsuccessful. Overall, stock valuation was graded as 3.89 (fairly successful) over 5 on average by all responders (Standard Deviation – SD=0.7960). This grade was 3.95 (fairly successful) (SD=0.9495) for traditional method users. However, this application was graded as 3.80 (fairly successful) on average by ABC users (SD=0.5606).

In the stock valuation part, an additional question was asked on the success on stock holding policies. This question was viewed as fairly successful as well (3.86, SD=0.7724) (on average - by all responders). This was graded as 3.90 (fairly successful) (SD=0.9119) by traditional method users. On the other hand, this application was graded as 3.80 (fairly successful) on average by ABC users (SD=0.5606).

Innes et. al. (2000) presented success of ABC for stock valuation based on two follow up studies as 3.6 over 5 (SD= 1.0) (1994), 4.6 over 5 (SD= 0.5) (1999).

b) Product/Service Pricing

In the related question, the responders were required to rate success of their cost accounting method on product/service pricing. This application was generally viewed as fairly successful and very successful by all responders. Only a few of responders viewed this as neutral and one of responders viewed it as fairly unsuccessful. The application was rated as 4.06 (fairly successful) on average by all participants (SD=0.6835). This was graded as 4.15 (fairly successful) (SD=0.6708) by traditional method users. On the other hand, ABC users graded this application as 3.93 (fairly successful) on average (SD=0.7037). This application is one of most highly rated application among the others in general, particularly by traditional method users.

Innes et. al. (2000) presented success of ABC for stock valuation based on two follow up studies as 3.8 over 5 (SD= 0.8) (1994), 4.1 over 5 (SD= 0.8) (1999).

c) Product/Service Output Decisions

Product/service output decisions were asked from responders in four categories: “overall success of implementation”, “establishing output volume levels”, “make or buy a component”, “drop or keep a product / service line”.

This application was generally viewed as fairly successful and neutral by all responders. Only a few responders viewed this as very successful and on of responders viewed it as fairly unsuccessful. Overall success of adopted method implementation on product/service output decisions was viewed as fairly successful (3.83) on average by all participants (SD=0.6636). This was graded as 3.85 (fairly successful) (SD=0.7452) by traditional method users. On the other hand, ABC users scored the same application as 3.80(fairly successful)

on average (SD=0.5606). Analysis of answers for output decisions' sub-categories is summarised in the table below.

Table 5-Analysis of the cost method for product/service output decisions sub-categories

	Traditional Method Users Mean (SD)	ABC Users Mean (SD)	Total Mean (SD)
Establishing output volume levels	3.70 (0.8013)	3.67 (0.6172)	3.69 (0.7183)
Make or buy a component	3.85 (0.7452)	3.73 (0.7037)	3.80 (0.7195)
Drop or keep a product / service line	3.55 (0.7592)	3.87 (0.7432)	3.69 (0.7432)

"Drop or keep a product/service line" was one of the most highly rated applications amongst all the other applications by ABC users.

Overall success of ABC for output decisions was presented by Innes et. al. (2000) based on two follow up studies as 3.7 over 5 (SD=0.8) (1994), 4.2 over 5 (SD=0.8) (1999).

d) Cost Reduction

Cost reduction is the one of two main categories that ABC cost method was perceived more successful than traditional cost methods (the other one is capacity planning). Moreover, in total, ABC cost method was rated for only five sub-categories as more successful than traditional cost methods,i.e, "overall cost reduction", "drop or keep a product/service line", "value,/non-value added

activity categorisation" "overall capacity planning" and "improved variance Information feedback" .

This application was generally viewed as fairly successful and neutral by all responders. Only a couple of responders viewed it as very successful.

All users graded overall success of cost reduction as 3.80 (fairly successful) on average (SD=0.6325). This grade was 3.75 (fairly successful) on average (SD=0.6387) for traditional method users. In particular, ABC users graded this application as 3.87 (fairly successful) (SD=0.6399).

When it comes to "value -non value added activity categorisation" all users graded this category as 3.71 (fairly successful) on average (SD=0.6217). This grade was 3.70 (fairly successful) (SD=0.6569) for traditional method users. In particular, ABC users graded this application as 3.73 (fairly successful) on average (SD=0.5936).

Innes et. al. (2000) presented success of ABC in terms of cost reduction based on two follow up studies as 3.8 over 5 (SD= 0.8) (1994), 4.0 over 5 (SD= 0.8) (1999).

e) Budgeting

Budgeting is one of main activity for planning and controlling activities. Since cost information is one of main component for any budgeting activity, this part of the questionnaire included more detailed questions about budgeting issues and cost information, including overall success of implementation, better identification of resource needs, ability to set more realistic budgets,

identification of budgetary slack, linking of costs to outputs and staff performance, enhanced participation by staff in budget setting, clearer linking of costs with staff responsibilities and improved Variance Information feedback. This application was viewed as fairly successful and neutral by all responders in terms of overall success. Only a few of all responders viewed as very successful and fairly unsuccessful.

Moreover, overall success of adopted method implementation on budgeting issues was viewed as 3.69 (fairly successful) on average by all participants (SD=0.7581). This grade was 3.70 (fairly successful) (SD=0.7327) for traditional method users. On the other hand, ABC users scored same application as 3.67 (fairly successful) on average (SD=0.8165). Analysis of answers for budgeting sub-categories is summarised in the table below.

Table 6-Analysis of the cost method for budgeting sub-categories

	Traditional Method Users Mean (SD)	ABC Users Mean (SD)	Total Mean (SD)
Better identification of resource needs	3.80 (0.6156)	3.40(0.9856)	3.63(0.8075)
Ability to set more realistic budgets	3.70 (0.7327)	3.53(0.8337)	3.63(0.7702)
Identification of budgetary slack	3.75 (0.6387)	3.47(0.8338)	3.63(0.7311)
Linking of costs to outputs and staff performance	3.70 (0.7327)	3.47(0.9155)	3.60(0.8117)
Enhanced participation by stuff in budget setting	3.65 (0.8127)	3.48(0.8338)	3.57(0.8148)
Greater acceptance of budgets by staff	3.65 (0.6708)	3.53(0.8338)	3.60(0.7356)
Clearer linking of costs with staff responsibilities	3.50 (0.6882)	3.40(0.9103)	3.46(0.7800)
Improved Variance Information feedback	3.55 (0.7592)	3.67(0.6172)	3.60(0.6945)

Innes et. al. (2000) presented success of ABC for budgeting based on two follow up studies as 3.7 over 5 (SD=0.9) (1994), 3.9 over 5 (SD=0.1) (1999).

f) Capacity Planning

This is one of applications where ABC cost method was rated more successful than traditional cost methods. This application was generally viewed as fairly successful and neutral by all responders. The remaining viewed this as fairly unsuccessful and very successful. Overall success of the adopted method implementation on capacity planning issues was viewed as 3.57 (fairly successful) (SD=0.8501) on average by all participants. This grade was 3.55 (fairly successful) (SD=0.8256) for traditional method users. On the other hand, ABC users scored same application as 3.60 (SD=0.9103).

g) New Product/ Service Design and Planning

The cost method was generally viewed as fairly successful and neutral in terms of this application. Only a few of them viewed this application as fairly unsuccessful and very successful. Overall success of the adopted method implementation on new product/service design and planning issues was viewed as 3.71 (fairly successful) (SD=0.8250) on average by all participants. This grade was 3.75 (fairly successful) (SD=0.7164) for traditional method users. On the other hand, ABC users scored same application as 3.67 (SD=0.9759).

This query also took a place in a paper by Innes et. al. (2000) based on two follow up studies scored by ABC adopters as 3.8 over 5 (SD=0.9) (1994), 3.8 over 5 (SD= 1.1) (1999).

h) Process Design and Improvement

This application was generally viewed as fairly successful and neutral by all responders. A few of them viewed this as very successful and only of of them viewed this as fairly unsuccessful. Overall success of the adopted method implementation on process design and improvement issues was viewed as 3.83 (fairly successful) on average by all participants (SD=0.6636). This grade was 3.75 (fairly successful) (SD=0.6387) for traditional method users. On the other hand, ABC users scored the same application as 3.67 (fairly successful) on average (SD=0.8165).

i) Customer Profitability Analysis

In the customer profitability analysis, responders were asked about six categories: “overall success of implementation”, “guidance for customer relation policies”, “guidance for pricing policies”, “influence cost control in respect to customers”, “dropping customers”, “renegotiation of customer contracts”.

Overall success of this application was generally viewed as fairly successful and neutral by all responders. Only a few of them viewed this as very successful and one of them viewed it as very unsuccessful. Overall success of the adopted method implementation on customer profitability analysis was viewed as 3.85 (fairly successful) on average by all participants (SD=0.7452). This grade was 3.90 (fairly successful) (SD=1.0208) for traditional method users. On the other hand, ABC users scored the same application as 3.73 (fairly successful) on average (SD=0.5936).This application is one of the most successful application that ABC users rated. Analysis of answers for customer profitability analysis is summarised in the table below.

Table 7-Analysis of the cost method for sub-categories of customer profitability analysis.

	Traditional Method Users Mean (SD)	ABC Users Mean (SD)	Total Mean (SD)
Guidance for customer relation policies	3.85 (0.6708)	3.73 (0.7037)	3.80(0.6774)
Guidance for pricing policies	4.05 (0.6863)	3.87 (0.6399)	3.97(0.6636)
Influence cost control in respect of customers	3.80 (0.6959)	3.73 (0.7037)	3.77(0.6897)
Dropping customers	3.85 (0.7452)	3.60 (0.7368)	3.74(0.7413)
Renegotiation of customer contracts	4.00 (0.6489)	3.67 (0.6172)	3.86(0.6482)

This query also took a place in a paper by Innes et. al. (2000) paper based on two follow up studies scored by ABC adopters as 3.9 over 5 (SD= 0.7) (1994), 4.2 over 5 (SD= 0.8) (1999).

j) Activity Performance Measurement/ Improvement

This application was generally viewed as fairly successful and neutral by all responders. Only a few of them viewed this as fairly unsuccessful and very successful. Overall success of the adopted method implementation activity performance measurement/ improvement issues was viewed as 3.74 (fairly successful) on average by all participants (SD=0.7413). This grade was 3.95 (fairly successful) (SD=0.6048) for traditional method users. On the other hand, ABC users scored the same application as 3.47 (fairly successful) on average (SD=0.8338).

This query also took a place in a paper by Innes et. al. (2000) paper based on two follow up studies scored by ABC adopters as 3.7 over 5 (SD= 0.8) (1994), 3.9 over 5 (SD= 0.8) (1999).

5. Discussion

Accurate and analytical cost information is vital in order to determine every operational and strategic issue for management in the organisation. Every organisation makes some effort in order to obtain more reliable cost information. As was mentioned in the literature review part, the most important way to reach accurate cost information is the method of assigning overheads to the production. In other words, more accurate cost information can be calculated by means of appropriate cost drivers that allocate overhead costs to the products. Traditional cost systems use simple methods e.g., labour hours, labour and material costs, process time, etc. to allocate overhead costs to production that have been criticized by ABC supporters for causing some distortions in cost information.

Based on the findings the survey shows, publicly quoted larger manufacturing companies in Turkey, which participated in the survey, are generally NON-SME companies under the definition of SME according to Turkish regulations. Moreover, these companies have been dealing with manufacturing for a significant amount of time, and their sectors range from a number of different industries: from food industry to machine industry. In addition, they have experienced accountants addressing accounting issues such as choosing the costing system. Among the participants, some additional modern cost systems are also adopted such as kaizen costing and target costing methods.

In addition to these general characteristics, analysis of the data shows that there is a significant positive relationship between the company size and ABC adoption among participants of this study. This result confirms Drury's (2013) arguments that traditional cost systems are more convenient to implement particularly for small size companies in terms of the cost of training and software requirements. Furthermore, according to the findings, the estimated rate of overhead costs is very high in total cost of production along with material and

labour costs. These general basic specifications point out the merits and necessity of ABC adoption.

Accuracy and effectiveness of the cost information in accounting information system is strongly related to the costing system that organisations have adopted. When adopting a costing system is considered, this survey shows that participants of this survey, which are Turkey's large manufacturing organisations still predominantly, use traditional costing methods. The survey shows the ABC adoption rate is 43% (n=15) among responders of the survey. However, traditional method users are 57% (n=20) of responding companies. This finding clearly shows that the ABC paradox is valid for Turkish manufacturing companies. The ABC paradox was defined as despite providing analytical and accurate cost information, diffusion of ABC had not been as high as may have been expected (Gosselin, 1997). While the proportion of overhead costs is significant in total cost of the production and these companies are well-organised companies that can adopt modern costing systems, why do they still prefer to use traditional costing systems mostly? This question was answered by those organisations which have neither considered nor rejected ABC adoption, as mostly it is not appropriate for their type of business. The other reasons for not adopting ABC were that it requires a high level of resources to design initiate and implement, a lack of sufficient benefits compared to its cost, and resistance of employees.

On the other hand, when ABC adoption is analysed, it shows different stages of adoption. However, most ABC users have adopted ABC for all the applicable parts of the organisation. According to the findings, ABC users are somewhat mixed with using ABC with previous methods and replacing the previous method. Some organisations had restructured their organisations to fit into the ABC cost system. This point confirms the ABC theory that was described as, some activities may not match formal departmental boundaries as they represent real occurrences in a company (Innes and Mitchell, 1993).

Besides, according to findings, top managements support for adoption of ABC is not very strong. Lastly, the main positive benefit of ABC was mostly answered as refining product cost to improve profit analyses of individual product lines. As it was mentioned in the literature review part, product costing was one of main application that initiated ABC.

While ABC was initiated from product costing applications, now it covers all core management accounting areas, i.e., sold products and stock valuation, decision making, control and performance measurement and assessment (Innes and Mitchell, 1995). This study examined the assessment of accounting managers for their cost system regardless of whether ABC had been adopted or not.

Contrary to expectations, the survey clearly showed that there is no significant difference between ABC adopters and traditional methods' users in the sense of valuing their costing system in terms of many managerial applications. Moreover, traditional cost method users scored success of their cost system as more than ABC users in terms of decision-making and the other applications. When 30 applications (all applications with subcategories) are considered, ABC users graded only 5 applications as more than traditional method users (namely, "overall cost reduction", "drop or keep a product/service line", "value –/non-value added activity categorisation" "overall capacity planning" and "improved variance information feedback"). Traditional method users scored the rest of applications (25 applications) as higher than ABC adopters.

These results might be reasoned as follows: The decision of cost management system inherently is taken by the accounting manager. Therefore, participants of this survey, accounting managers and financial directors and the others have evaluated their own decisions indirectly by scoring the success of the system in terms of different applications. The other reason is since ABC cost system initiates defining activities and analysing all cost information, and it gives clearer

and more detailed data, managers can see defects and imperfectness of the system and they can assess it more accurately, therefore, avoiding over grading the system.

When interviewees' responses are also taken into account, these results will be more robust. Firstly, interviewees clearly acknowledged that traditional costing systems normally create a distortion in the cost information. For example, one interviewee replied to the question about the distortion as, "Direct costs (labour + raw material) are accurate. However, when overheads are allocated according to some cost drivers (we use labour hours), some distortion occurs" another interviewee responded to the same question as "…My answer for distortion query, for mass production manufacturing companies is yes" (See Appendix IV Interview Answers).

These two interviewees graded their costing system as fairly successful in sense of overall satisfaction when they responded the questionnaire. Along with that, some proportion of deviation in cost information seems as acceptable for responders. One interviewee said "…Currently, 5% deviation in the cost information is acceptable for us". Thus, when to read between lines and the questionnaire results, apparently managers of the organisations have no full confidence in their cost information. Furthermore, they are aware of not having accurate data. These statements confirm Cooper and Kaplan's assessment that many managers who use traditional cost systems are aware of the distortion (Cooper and Kaplan, 1988).

In addition to that, interviewees of this study also mentioned a need for analytical, more accurate and detailed cost information. One of the interviewees said: "Some further changes can be done in order to get more accurate cost information…" Another interviewee pointed to analytic cost information by mentioning different forms of the cost information: "If mass production manufacturing companies are also global players they cannot be managed by

only one system. When you offer your products, semi products or row materials to international markets, you should also consider about competition. So that you should also do some work on some different cost information such as transformation cost, ex-factory cost".

On the other hand, some of financial directors (interviewees) who were using traditional cost systems in their organisations stated consent about their current cost system. One of these financial directors who rejected usage of ABC after experiencing for a while said, "I have decided about the costing system that we are using currently. We have tried process-costing system and activity based costing previously. The reason, which mostly has affected my decision, was capacity usage rate of the plants. Assessing and managing your fix costs and variable costs affects your total cost. We made this decision by considering the system that is less affected by employees is less vulnerable to mistakes. For instance, activity based costing system provides more ideal results for firms which are highly automatized and employed less workers in the production". Another financial director said, "We think we have a system which fits into our company structure. We update our system permanently in order to seek the better". Moreover, another financial director drew attention to importance of row material along with overhead costs: "…Since in automotive industry 85% of costs are composed by row materials, we were very sensitive about this issue…" Even though distortion in cost information is a substantial issue for organisations, still ABC is not being perceived as an essential solution by the organisations and there are some other concerns such as capacity level and material cost. However, capacity level was one of the strong points of time driven ABC. Time driven ABC addresses this issue by differentiating between the theoretical and practical capacity of the company.

While interviewees of this study supported the need for change by means of different arguments, they also highlighted the difficulty of the change in the current cost system. One interviewee said, "Some further changes can be done

in order to get more accurate cost information. However, this is very comprehensive and expensive process". This argument as also one of the findings of the questionnaire confirmed by Cobb et al. (1992). His findings suggesting that ABC requires a substantial amount of resources that associated with ABC as a problem.

Two interviewees mentioned their experience with an integrally working software program for costing system. Both of them employed by SAP and they have been using ABC based modules. One of them said, "Our costing system is based on the CO module of the SAP and it is working with other modules integrally. Thus, we have no plan for a new costing system". He also answered another question asking requirements for changing their cost system as, "We had some assessments before employing the SAP system. We had done some benchmarking with some companies that work in the automobile industry. Our expectations from the new system were accurate raw material cost information. Therefore, engineering materials list (apl) and production materials should be consistent. For this consistency, all departments in the plant should work with the same software base and should create data for the same software base. … We wanted to see every stage of allocation where direct labour and overhead costs are allocated to the vehicles. We also wanted all records to be transferred to financial accounts automatically and to see these distributed costs in financial accounts. We also expected a user friendly and flexible program". The same interviewee answered another question by saying "It is possible to add new modules and to develop our current software (SAP)". The other financial director, who adopted SAP, said, "We think we have a system which fits into our company structure. We will update our system permanently in order to seek the better".

Lastly, some of them mentioned the requirement of top management decision in order to change current cost system. "When a change in costing system is needed, we should make a decision with our top management and financial

affair presidency". Another interviewee explained the procedure as, "There is not any this kind of demand from the top management right now. Therefore, we are not planning to change our current system in the short term".

The last two points can be highlighted before conclusion. First, the ABC adoption that was found in this study is lower than that found in Karcıoğlu and Öztürk's (2012) survey. This rate was found to be 66.6% (n= 58). This difference might be reasoned with having responses from different organisations in the total population. Some of these organisations also might stop their operations. In addition to that, some responses may not be reflecting the truth in both of surveys.

Lastly, when success results of ABC adopters on their cost system compared with Innes and Mitchell, (1995) and Innes, Mitchell and Sinclair's, (2000) findings, UK based ABC adopters had assessed their cost system more successful in terms of decision making and the other applications. This can be reasoned as UK organisations have more experiences on ABC systems and they conduct the system more appropriately to have more successful results.

6. Conclusion

6.1. Literature summary

Long-term accurate, analytical and reliable cost information provides a strong basis in terms of operational and strategic decisions. Activity based costing and time driven ABC has been developed and advocated as a superior method rather than previous traditional methods to provide long-term accurate cost information in order to make appropriate decisions. In addition to that, Activity Based Management was developed as a management method that improves the operations by means of activity based system. Literature shows that ABC has various uses in the managerial area as a cost system such as stock valuation, product and service pricing, output decisions, cost reductions, capacity planning, and workforce management. According to the theory, activity based costing methods mainly allocate overhead costs more appropriately to obtain more accurate cost information. In the last quarter of the twentieth century, because of more and more automation in production overhead costs (such as set up machine cost, maintenance of machines) have become much more significant in the total cost of production comparing stable or decreasing level of labour and material cost.

6.2. Research summary

This research aimed at investigating the effectiveness of the cost management systems in large manufacturing companies of Turkey. Since ABC (activity based costing) is suggested and subjected in many studies as providing a more accurate, analytical and long-term reliable information, this study has a special emphasis on use of activity based costing. The research part included both a questionnaire and interviews to engage in:

- identifying cost system of population of the study,
- investigating effectiveness of costing methods based on how successfully they use costing system for the purposes of usage of costing methods,
- assessing adoption of activity based costing.

This study showed that to some extent publicly quoted manufacturing companies in Turkey have adopted and implementing Activity Based Costing systems. However, the majority of organisations whose managers responded to this survey were still using traditional costing systems. In addition to that, when overall satisfaction of cost systems compared, ABC satisfaction was rated less than traditional costing methods. Moreover, when the other applications take into account, traditional costing systems were generally viewed as more successful than ABC in terms of all 30 applications. More particularly, ABC was viewed for only five applications as more successful than traditional methods. For the rest of the 25 applications, the average perceived success was less than traditional methods.

When the survey results are considered with interviews, it is very clear that traditional methods are still primarily applicable within activity based cost systems. Moreover, there are some other conditions along with accurate cost information that have some impact on determining the cost system, e.g., company size, sector, adopted software program and cost of the system. These results also confirmed that since designing an optimal cost system is complex and expensive, there is a dilemma between accurate cost information and its expense. Therefore Drury (2013) and Kaplan and Atkinson (1998) argued about making a decision between traditional cost systems and ABC or more complex ABC and essential type of ABC.

6.3. The Limitations and Suggestions for Further Work

This research has a number of limitations that should be noted. The most important one was that individuals of the population were publicly quoted companies. This condition has extensively limited quantity and quality of surveys responses. Since it was perceived that it would be disadvantageous to share any specific information with anyone, participation rate was very limited. There were also some hesitations to participate and answer the interview questions as well.

Another limitation was location of the individuals. Since the population of the survey is composed of larger manufacturing companies in all Turkey, their headquarters are in different areas in Turkey. Therefore, due to time and traveling limitations, the survey was carried out from long distances via internet. This survey could be conducted face to face so that many concepts in the survey could be defined and described to confirm if audiences understand the same concepts in the same way.

Another concern was that companies who responded to the invitation said that they were too busy to allocate time to participate in any survey. This situation forced the author of this study to design a simpler questionnaire.

This study has attempted to find the adoption rate of ABC in publicly quoted manufacturing companies in Turkey. It also attempted to measure success of both ABC and traditional cost systems.

Meanwhile a few areas have been identified, which are topics for further research.

- A general research on the adoption rate of ABC and effectiveness of cost systems in Turkey.

- A specific study on SME organisations in order to identify cost systems and essential conditions that determine and shape any cost system.

- Action studies initiating and implementing any cost system particularly Time Driven ABC.

- Operational and strategic outcomes of the cost system in an organisation from managerial perspectives.

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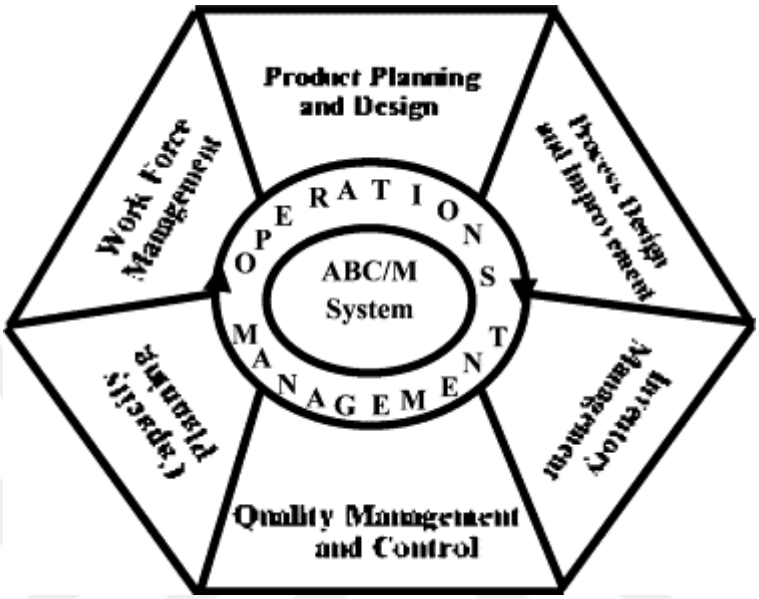
APPENDIXES

I- Operations Hexagon (Gupta and Galloway,2003)



II- English and Turkish Versions of the Questionnaire

The following study was used to design the questions.

(Innes, J. and Mitchell, F (1995) A survey of activity-based costing in the UK's largest companies. *Management Accounting*, 6 (1995), pp. 137–153. [ONLINE]. Available at: http://www.sciencedirect.com/science/article/pii/S1044500585710086. [Accessed 07 July 2014].)

Questionnaire

This questionnaire is prepared for understanding your cost management system and uses of this system in terms of management decisions. The results of this questionnaire will be used in a study which aims to measure effectiveness of cost management systems in large manufacturing companies in Turkey. This survey is completely anonymous and all information given will be confidential. This study is for academic purposes only.

General Information about the Organisation and Responder

Firm Name:

The organisations current activities:

How many years has the organisation been manufacturing? ( ) Year/s

Average employee numbers:

Last annual sales:

Full Name of Responder:

Occupation of responder in the firm:

How long have you been employed in this position? ( ) Year/s

The Method of Cost Management and Calculation

1. Which measurement tool do you use to allocate overhead costs to products?

   a) Labour hours
   b) Machine hours
   c) Processing time
   d) Labour or Material cost
   e) ABC allocation drivers

2. How many years have you been using your current cost allocation method?

   ( ) Year/s

3. Could you please describe your product costing method in a summary?

4. Do you use any of the below written costing methods for management accounting purposes? (More than one can be chosen)

   a) Kaizen costing
   b) Target costing
   c) Activity based costing
   d) Time driven -Activity based costing
   e) Quality Cost System
   f) Just-in-time costing
   g) Product life cycle costing

5. What is the estimated average proportion of overhead cost in product cost?

6. What is the current adaptation situation of ABC (or time driven ABC) in your company?

a) Currently using ABC
b) Currently considering ABC adoption
c) Rejected ABC after assessment
d) Have not considered ABC to date

7. If you have rejected the adoption of ABC (or time driven ABC), please give your reasons for that rejection?

   a) It requires a high amount of resources to design and implement it
   b) Resistance of employees
   c) Insufficient benefit comparing to its cost

d) Inappropriate for our type of business

Effectiveness of the Cost Method

8. A- How would you rate your overall experience with ABC (or time driven ABC)?

   B- Or if you have not adopted ABC, how would you rate your overall satisfaction with your cost management system? (Please answer either 6A or 6B).

6A	6B
Very successful	Very successful
Fairly successful	Fairly successful
Neutral	Neutral
Fairly Unsuccessful	Fairly Unsuccessful
Very Unsuccessful	Very Unsuccessful

9. How would you rate ABC (or time driven ABC) implementation in terms of purposes of usage? / If you have not adopted ABC yet, how would you rate your current cost management system in terms of the same purposes?

a) Stock valuation

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ()
Success on stock holding policies	1( )	2( )	3( )	4 ( )	5 ()

(Inventory management)

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

b) Product/Service Pricing

If adopting,

Overall, Success of Implementation 1( ) 2( ) 3( ) 4 ( ) 5 ()

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

c) Product/Service Output Decisions

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )
Establishing Output Volume levels	1( )	2( )	3( )	4 ( )	5 ( )
Make or buy a component	1( )	2( )	3( )	4 ( )	5 ( )
Drop or keep a product / service line	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

d) Cost Reduction

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )
Value -non value added activity categorisation	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

e) Budgeting

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )
Better identification of resource needs	1( )	2( )	3( )	4 ( )	5 ( )
Ability to set more realistic budgets	1( )	2( )	3( )	4 ( )	5 ( )
Identification of budgetary slack	1( )	2( )	3( )	4 ( )	5 ( )
Linking of costs to outputs and staff performance	1( )	2( )	3( )	4 ( )	5 ( )
Enhanced participation by stuff in budget setting	1( )	2( )	3( )	4 ( )	5 ( )
Greater acceptance of budgets by staff	1( )	2( )	3( )	4 ( )	5 ( )
Clearer linking of costs with staff responsibilities	1( )	2( )	3( )	4 ( )	5 ( )
Improved Variance Information feedback	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

f) Capacity Planning

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

g) New Product/ Service Design and Planning

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

h) Process Design and Improvement

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

I) Customer Profitability Analysis

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )
Guidance for customer relation policies	1( )	2( )	3( )	4 ( )	5 ( )
Guidance for pricing policies	1( )	2( )	3( )	4 ( )	5 ( )
Influence cost control in respect of customers	1( )	2( )	3( )	4 ( )	5 ( )
Dropping Customers	1( )	2( )	3( )	4 ( )	5 ( )
Renegotiation of Customer contracts	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

i) Activity Performance Measurement/ Improvement

If adopting,

Overall, Success of Implementation	1( )	2( )	3( )	4 ( )	5 ( )

(1- Very Unsuccessful 2- Fairly Unsuccessful 3-Neutral 4- Fairly Successful 5- Very Successful)

ABC Method Users

Questions for only ABC (or time driven ABC) Users

10. If you have adopted ABC (or time driven ABC), what is the stage of adaptation?

a) Being used for all applicable parts of the organisation
b) Only being used for the most applicable parts of organisation
c) ABC is adopted for only a few of the applicable parts

11. What is the usage type of ABC (or time driven ABC)?

a) It has replaced a previous costing system
b) It is being used in parallel with a previous costing system
c) It was only considered to be in an early pilot testing form

12. To what extent do top management support adoption of ABC?

1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Very weak 2- Fairly Weak 3- Neutral 4- Fairly Strong 5- very Strong)

13. Have you redesigned the organisational structure to match the ABC system?

Yes ( ) No ( )

14. What is the main positive benefit of ABC?

a) Visibility and scope in for resource consumption
b) Refining product cost to improve profit analyses of individual product lines
c) Contributing to customer and market profitability analysis
d) It aids price decisions
e) It can improve performance in activities which become the focus of the system

ANKET

Bu anket çalışması maliyet yönetim yönteminizi ve yönetim kararlarında nasıl kullanıldığını anlamaya yönelik olarak hazırlanmıştır. Bu anketin sonuçları Türkiye'deki büyük üretim şirketlerinin maliyet yöntemlerinin kullanımının etkinliğini ölçmeyi amaçlayan bir tez çalışmasında kullanılacaktır. Bu çalışma tamamen anonimdir ve verilen bütün bilgiler gizli olarak addedilmektedir. Bu çalışma ancak akademik amaçlara yönelik olarak yürütülmektedir.

İşletme ve Anket Katılımcısına dair Genel Bilgi

İşletme Unvanı :

İşletmenin Hâlihazırdaki Fiili Faaliyeti:

İşletmeniz kaç yıldır üretim ile iştigal etmektedir ? : ( ) Yıl

Ortalama Çalışan Sayısı : ( )

En son yıllık satış geliriniz (ciro) : ( )

Anket Katılımcısı Ad- Soyadı:

Şirket içindeki pozisyonu:

Kaç yıldır bu görevde istihdam edildiği:

Kullanılan Maliyet Hesaplama ve Yönetim Metodu

1. Genel giderlerin ürüne dağıtımı amacı ile hangi dağıtım aracını kullanmaktasınız?

    a. İşçilik saatleri
    b. Makine saatleri
    c. Proses süresi
    d. İşçilik ya da hammadde maliyeti
    e. FTM (faaliyet tabanlı maliyetleme) dağıtım anahtarları

2. Hâlihazırdaki maliyet dağıtım metodunuzu kaç yıldır kullanmaktasınız?

   ( ) Yıl

3. Ana hatları ile ürün maliyeti hesaplama metodunuzu anlatır mısınız?

4. Aşağıda yazılı maliyetleme yöntemlerini kullanıyor musunuz (Bir veya birden fazla yöntem seçilebilir) ?

   a. Kaizen Maliyetleme
   b. Hedef Maliyetleme
   c. Faaliyet Tabanlı Maliyetleme
   d. Zaman Sürücülü Maliyet Tabanlı Maliyetleme
   e. Kalite Maliyet Sistemi
   f. Tam Zamanında Üretim Ortamında Maliyetleme
   g. Mamul Yaşam Dönemi Maliyetleme

5. Tahmini olarak mamul maliyeti içeresindeki genel üretim maliyeti oranı nedir (tüm mamul maliyetine oranlandığında) (Üretilen temel ürünler için) ?

6. Hâlihazırda işletmenizde FTM (ya da zaman sürücülü FTM) kullanım durumu nedir?

   a. Şuan FTM kullanılmaktadır
   b. FTM uygulama durumunu değerlendirme sürecindeyiz
   c. Değerlendirmeden sonra FTM kullanımını reddettik
   d. Şimdiye kadar FTM'ye dair bir değerlendirme yapılmadı

7. Eğer FTM kullanımını reddetti iseniz (ya da zaman sürücülü FTM'yi), lütfen reddetme nedeninizi belirtir misiniz (birden çok seçenek belirtilebilir) ?

   a. Dizaynı ve yürütülmesi çok fazla kaynak gerektirmektedir.
   b. Çalışanların karşı duruşu
   c. Maliyeti ile karşılaştırıldığında faydasının yeterli olmayışı
   d. Faaliyet tipine uygun olmayışı

Kullanılan Maliyetleme Yönteminin Etkinliği

8. A- Bütün olarak FTM(ya da zaman sürücülü FTM) deneyiminizi nasıl değerlendirir siniz?

   B- Eğer FTM uygulamasını tercih etmemiş iseniz bir bütün olarak kullandığınız maliyetleme yönteminden memnuniyetinizi nasıl değerlendirirsiniz? (Lütfen 6A veya 6B olarak cevaplandırınız),

6A	6B
Çok Başarılı	Çok Başarılı
Oldukça Başarılı	Oldukça Başarılı
Orta düzeyde	Orta düzeyde
Oldukça Başarısız	Oldukça Başarısız
Çok Başarısız	Çok Başarısız

9. FTM'yi (ya da zaman sürücülü FTM) aşağıda yer alan kullanım amaçları bakımından nasıl değerlendirir siniz?
   Eğer FTM uygulamasını tercih etmemiş iseniz kullandığınız maliyetleme yöntemini aşağıda yer alan kullanım amaçları bakımından nasıl değerlendirir siniz?

a) Stok Değerleme (Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız),

Bir bütün olarak uygulamanın başarısı	1( )	2( )	3( )	4 ( )	5 ()
Stok yönetimi-elde tutma uygulamaları açısından	1( )	2( )	3( )	4 ( )	5 ()

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

b) Ürün / Hizmet Fiyatlaması (Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız)

Bir bütün olarak uygulamanın başarısı	1( )	2( )	3( )	4 ( )	5 ()

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarılı 4- Oldukça Başarılı 5- Çok Başarılı)

c) Ürün / Hizmet Çıktı Kararları

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı	1( )	2( )	3( )	4 ( )	5 ()
Toplam Çıktı Miktar Düzeyi Belirleme	1( )	2( )	3( )	4 ( )	5 ()
İşletmede Üretim ya da Satın Alma Kararları	1( )	2( )	3( )	4 ( )	5 ()
Bir ürün veya hizmet Grubunu Elimine etme	1( )	2( )	3( )	4 ( )	5 ()

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

d) Maliyet Azaltımı

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı	1( )	2( )	3( )	4 ( )	5 ( )
Katma değer sağlayan-sağlamayan					
Faaliyetlerin ayrımı	1( )	2( )	3( )	4 ( )	5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

e) Bütçeleme

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı	1( )	2( )	3( )	4 ( )	5 ( )
Gerekli kaynakların daha iyi tespiti	1( )	2( )	3( )	4 ( )	5 ( )
Daha gerçekçi bir bütçe yapılması	1( )	2( )	3( )	4 ( )	5 ( )
Bütçesel Fazlalıkların belirlenmesi	1( )	2( )	3( )	4 ( )	5 ( )
Çıktı maliyeti ve Çalışan performansı					
ile bağlantı kurulması	1( )	2( )	3( )	4 ( )	5 ( )
Bütçeleme çalışmalarına çalışanların katılımının					
sağlanması	1( )	2( )	3( )	4 ( )	5 ( )
Bütçenin çalışanlar tarafından daha					
iyi benimsenmesi	1( )	2( )	3( )	4 ( )	5 ( )
Çalışan sorumluluğu ile maliyet arasında					
daha açık ilişkilendirme sağlanması	1( )	2( )	3( )	4 ( )	5 ( )
Bilgi geribildiriminin geliştirilmesi ve çeşitliliği	1( )	2( )	3( )	4 ( )	5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

f) Kapasite Planlaması

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı 1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

g) Yeni Ürün/Hizmet Tasarımı ve Planlaması

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı 1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

h) Üretim Süreçleri Tasarımı ve Geliştirimi

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı 1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

i) Müşteri Karlılığı Analizi

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir Bütün Olarak Uygulamanın Başarısı 1( ) 2( ) 3( ) 4 ( ) 5 ( )

Müşteri İlişkileri Politikalarına Yön Vermesi 1( ) 2( ) 3( ) 4 ( ) 5 ( )

Fiyatlama Politikalarına Yön Vermesi 1( ) 2( ) 3( ) 4 ( ) 5 ( )

Müşteriler itibari ile maliyet kontrolüne etkisi 1( ) 2( ) 3( ) 4 ( ) 5 ( )

Müşteri Eleme (birlikte çalışmama kararı) 1( ) 2( ) 3( ) 4 ( ) 5 ( )

Müşteri Akitlerinin Yeniden Görüşülmesi 1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

j) Faaliyet Performans Ölçümü ve Geliştirimi

Maliyetleme yöntemini bu bakımdan kullanıyor iseniz cevaplayınız,

Bir bütün olarak uygulamanın başarısı 1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Çok Başarısız 2- Oldukça Başarısız 3-Orta Düzey Başarı 4- Oldukça Başarılı 5- Çok Başarılı)

FTM Yöntemi Kullanıcıları

Sadece FTM (zaman sürücülü FTM) Kullanıcılarına Yönelik Sorular

10. Eğer FTM(ya da zaman sürücülü FTM) kullanımına başlamış iseniz, kullanım düzeyiniz hangi genişliktedir?

    a. İşletmenin Uygulanabilir bütün bölümlerinde kullanılmaktadır
    b. En fazla kullanımı mümkün olan bölümlerinde kullanılmaktadır
    c. Sadece kullanımı mümkün bir kaç bölümde kullanılmaktadır

11. FTM(ya da zaman sürücülü FTM) kullanım şekliniz nasıldır?

    a. Daha öncesi maliyetleme yönteminin yerini aldı
    b. Önceki maliyetleme yöntemi ile birlikte kullanılmaktadır
    c. Pilot uygulaması olarak kullanılmaktadır

Şirket üst yönetimi ne ölçüde FTM uygulamasını desteklemektedir?

1( ) 2( ) 3( ) 4 ( ) 5 ( )

(1- Çok Az 2- Oldukça Az 3- Orta Düzeyde Desteklemekteler 4- Oldukça Fazla 5- Çok Fazla)

12. FTM sistemini uygulamak üzere organizasyon yapınızı yeniden dizayn ettiniz mi?

Evet ( ) Hayır ( )

13. FTM Uygulamasının Sizin İçin Temel Uygulama Yararı Nedir?

a. Kaynak tüketimi kapsamı ve belirginliği
b. Her bir ürün hattı için ürün maliyetinin belirlenmesi dolayısı ile karlılık Analizinin geliştirilmesi
c. Müşteri ve pazar karlılık analizine katkı sağlaması
d. Fiyatlama kararlarına katkı sağlaması
e. Sistemin odağına kaynaklık edecek faaliyetlerin performansını geliştirmektedir

III- English and Turkish Versions of the Interview text

Interview

First question - Give your opinion on whether your costing method distorts cost information or not. In other words, are you very satisfied with their current costing method or not?

Second question - Do you have any plan or action to adopt any other costing method including ABC to get more accurate costing information, in order to make better decisions in both operational and strategic areas?

Third question - Have you made any decisions on choosing other costing methods in the past and what your main reasons for taking the decision were?

Fourth question - Do you believe that you can obtain accurate and analytical cost information by making any changes in your costing system or is that only an effort to try get better results by using the current costing method without any change?

Mülakat

Birinci Soru – Şu an kullandığınız maliyetleme metodu sizce elde edilen maliyet bilgisini çarpıtmaktamıdır ya da doğru olarak yansıtmakta mıdır ?

İkinci Soru - Daha iyi maliyet bilgisi sağlayacak dolayısı ile daha iyi stratejik ve operasyonel karar almanızı sağlayacak, Faaliyet tabanlı maliyetleme sistemi dahil başka bir maliyetleme sistemi uygulanmasına dair bir planınız ya da çalışmanız var mıdır ?

Üçüncü Soru- Daha önce yeni bir maliyetleme sisteminin seçimine dair herhangi bir karar aldınız mı ? Kararınıza dayanak teşkil eden nedenler nelerdi ?

Dördüncü Soru- Maliyetleme sisteminizde değişiklik yaparak doğru ve analitik bir maliyetleme bilgisi elde edeceğinize inanıyor musunuz ? Yoksa bunun sadece şimdiki sisteminizle daha iyi sonuç elde etmeye yönelik bir çaba ile elde edileceğini mi düşünüyor sunuz ?

IV- Interview Answers

QUESTIONS	**First question - Give your opinion on whether your costing method distorts cost information or not. In other words, are you very satisfied with your current costing method or not?**	**Second question - Do you have any plan or action to adopt any other costing method including ABC to get more accurate costing information in order to make better decisions in both operational and strategic areas?**	**Third question - Have you made any decision on choosing other costing methods in the past and what your main reasons for taking the decision were?**	**Fourth question - Do you believe that you can obtain accurate and analytical cost information by making any changes in your costing system or is that only an effort to try get better results by using the current costing method without any changes?**
RESPONDERS				

Financial Director	I have found an opportunity to implement a variety of cost systems to examine various costing methods over a numbers of years. My answer for distortion query, for mass production manufacturing companies is yes.	If mass production manufacturing companies are also global players, they cannot be managed by only one system. When you offer your products, semi products or raw materials to international markets, you should also consider the competition. Therefore, you should also do some work on different cost information such as transformation costs, ex-factory costs. We have such a costing system which provides required costing data, whenever we need it.	I have decided on the costing system that we are currently using. We have previously tried the process-costing system and activity based costing. The reason that mostly has affected my decision was the capacity usage rate of the plants. Assessing and managing your fix costs and variable costs affects your total cost. We made this decision by considering the system that is less affected by employees, therefore, less vulnerable to errors. For instance, activity based costing system provides more ideal results for firms which are	Today I answer no. However, it is better to constantly search in order to reflect the changes in structure and flow of production to the costing system. I prescribe and demand this from my workmates as R&D in the costing system.

			highly automatized and employ fewer workers in the production process.	
Financial Director	The current cost system reflects accurate cost information.	We have employed SAP software. When a change in costing system is needed, we should make a decision with our top management and financial affair presidency.	Currently, we have no decision on this issue.	We think we have a system which fits into our company structure. We update our system constantly in order to seek improvement.
Financial Director	Direct costs (labour + raw material) are accurate. However, when overheads are allocated, according to some cost drivers (we use labour hours), some	We have no current plan for this. This kind of cost systems should be integrated within the financial accounting record system. We have our costing and accounting software systems. These	We have not made any kind of decision on this. The last time was 1986, when we purchased a new software program which is still working with our own software integrally. When this	Some further changes can be made in order to get more accurate cost information. However, this is very a comprehensive and expensive process.

	distortion occurs.	systems are integrated with the accounting recording system. You cannot change only the costing system. In addition to that, you should change the whole system so that it is a comprehensive work.	system was purchased, I was not working for this company. However, I learned that the system was purchased because it provided the organisation with a good basis (product tree, operations etc.), inventory management, standard and original cost information.	
Financial Director	It reflects cost information accurately.	Our company purchased all modules of SAP software about 3 years ago. Our costing system is based on the CO module of the SAP and it is working with other modules integrally. Thus, we have no plans for a new costing system.	We did some assessments before employing the SAP system. We had done some benchmarking with some companies that work in the automobile industry. Besides, our expectations from the new system were: accurate row	It is possible to add new modules and to develop our current software (SAP).

			material cost information. Therefore, engineering materials list (apl) and production materials should be consistent. For this consistency, all departments in the plant should work with the same software base and should create data for the same software base. Since in automobile industry, 85% of costs are composed of raw materials, we were very sensitive about this issue. We wanted to see every stage of allocation where direct labour and overhead costs are allocated to the vehicles. We also	

			wanted all records to be transferred to financial accounts automatically and to see these distributed costs in financial accounts. We also expected a user friendly and flexible program.	
Financial Director	Since the production process is very complex and complicated, we could not benefit from the standard systems. We have tried to develop our own system based on the process costing system. There are still some defects in the system. Currently, 5% deviation in	There is not any demand of this kind from the top management right now. Therefore, we are not planning to change our current system in the short term.	We have not done any work on that.	In order to attain better costing information, either the current system can be developed or some new systems can be tried. I think a serious costing study for the organisation should be done eventually.

	the cost information is acceptable to us.			

V- Chi Square Tests

Chi-Square Tests[c]

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.122[a]	1	.727	1.000	.527
Continuity Correction[b]	0.000	1	1.000		
Likelihood Ratio	.123	1	.726	1.000	.527
Fisher's Exact Test				1.000	.527
N of Valid Cases	35				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.43.

b. Computed only for a 2x2 table

c. For 2x2 crosstabulation, exact results are provided instead of Monte Carlo results.