

Toward Understanding the Complexities of Service Costing: A Review of Theory and Practice

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Abstract

The purpose of this paper is to outline the issues and challenges inherent in service costing, and thus to add to the limited body of knowledge in this field. Through a review of the extant literature, key service costing issues are identified and discussed. Despite the importance of the service sector as reflected in its growing contribution to the gross domestic product of many developed nations worldwide, this study demonstrates that the long-standing problems associated with service costing appear to remain unfathomed and unresolved.

This study may provide a better understanding of the challenges associated with service costing for both practising management accountants and members of academia. Deficiencies in the literature are pinpointed. This paper represents the first attempt to synthesise the currently fragmented literature on service costing, and as such, it is hoped that it will provide a platform for researchers wishing to undertake further research in service costing.

Keywords

Services
Service Costing
Management Accounting Research

Introduction

Most of the empirical research examining costing focuses on goods and manufacturing firms while studies on service costing and the service sector receive relatively less research attention. The service sector represents approximately 78.5% of the total real gross value added generated in Australia in 2011 (ABS, 2011) and employs about 85% of Australia's workforce (Australian Government, 2011). Worldwide, the International Bank for Reconstruction and Development (2012) reports that the service sector is the largest sector in high-income economies, accounting for more than 70% of gross domestic product. According to 2012 estimates, the percent of GDP attributed to services accounts to 92% in Hong Kong, 79.7% in the U.S.A., and 78.3% in the U.K. (Central Intelligence Agency, 2013). Clearly, research into service costing has failed to keep up with the growth in the services industry.

Research Motivation

Although studies conducted using service settings were doubled (from 3% in 1990-1999 period to 14% in 2000-2009 period); Activity-Based Costing (ABC) research fell from 7% in 1990-1999 to 5% in 2000-2009; and the proportion of studies dealing with cost accounting systems and techniques showed a fall from 11% in 1990-1999 to 4% 2000-2009 (Scapens and Bromwich, 2010). The predominance of manufacturing-focused academic studies is understandable given that costing methods were originally developed for manufacturing enterprises.

A survey of management accounting research covering 138 articles published in four major journals between 2008-2010 revealed that cost accounting-based articles (ABC and inter-organisational cost management) constitutes a total of 7.97% of total topic areas investigated (Harris and Durden, 2012). Chan and Lee (2003) and Drury and Tayles (2005) pointed to the crucial nature of accurate product and service cost information for the managers of this century which is characterised by intense competition, changing market conditions and shrinking profit margins. The importance of linking accounting research and service science was also underscored by Kerr (2008).

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Brignall et al.'s (1991) study of 5 service organisations' costing systems is probably the only paper that exclusively examines the service costing problem. The phenomenal growth enjoyed by the services sector in developed economies at the expense of the manufacturing sector, and the pervasiveness of challenges in service costing make it imperative to understand such issues and devise methods to address them. Overcoming difficulties in service costing continues to be one of the nagging challenges facing management accountants.

Service products often exhibit characteristics that are fundamentally distinct from those of goods. It is not surprising that costing systems that were originally developed for manufacturing firms are not necessarily appropriate for services. Although services account for over three-fourths of all costs in the most U.S. industries (Quinn et al., 1990), a survey of the US service industries carried out by Martinson (1994) shows that 65% of service companies lack a cost accounting system that is capable of measuring the cost of service output. It is hardly conceivable that managers of service firms can continue to operate with a costing system that is unreliable and prone to errors when making decisions based on cost information. We should be concerned that our lack of understanding of service costing means we cannot tackle problems associated with service costing in a concerted best-practice manner. Although some unique features of services are documented in the literature, disagreement exists as to whether costing systems originally designed for manufacturing businesses are also appropriate for services.

This paper aims to provide some insight into the unique costing features of services and the manner in which they impact on service costing. The study should also be of interest to managers in service organisations and management accounting academics as it highlights the specific issues and practices surrounding service costing as reported in the literature.

The remainder of the paper is structured as follows. The following section outlines the distinctive features of services compared with goods from a costing perspective. Next, a discussion of the costing implications of differences between goods and services is

presented. Then, descriptions of the accuracy of cost information for services, the cost structure of service firms, and the treatment of joint costs are presented, followed by an outline of overhead allocation problems and a discussion of the applicability of activity-based costing (ABC) to service businesses. This is then followed by a discussion of time-driven activity-based costing (TDABC) as it relates to service costing. The final section comprises conclusions and suggestions for further research.

How Do Goods and Services Differ?

Intangibility of services is the key differentiating factor between the output of service and manufacturing organisations because intangibility impedes identification of a unit of service rendered (Thomas, 1978) and makes it more difficult to measure the value of the service product accurately because its value depends on the perception of the customer (Ward, 1993). With reference to an unidentified source, Gummesson (1987) describes services as "something that can be bought and sold, but which you cannot drop on your foot". He then adds that there are service activities and manufacturing activities, and attempts to distinguish between manufacturing and non-manufacturing are not very meaningful. Similarly, Reinartz and Ulaga (2008) argue that in fact, all product companies are in the business of delivering services, but they just have not realised it yet.

Measurement difficulties brought about by the intangibility of services also exacerbate the financial monitoring and control of service organisations. In their seminal research, Brignall et al. (1991) contend that the intangibility of most services compounds the product costing issues in service organisations.

The line between services and goods is often blurry, as many firms exhibit both service and manufacturing characteristics (Bowen et al., 1989). As shown in Table 1, at an organisational level, prominent differences of service production and delivery compared with manufacturing firms' output encompass intangibility of output (Bowen et al., 1989; Rotch, 1990; Fitzgerald et al., 1991; Zeithaml et al., 2013), perishability (Fisk et al., 1993; Zeithaml et al., 2013), and heterogeneity (Fitzgerald et al., 1991; Fisk et al., 1993,

	Bowen et al. (1989)	Rotch (1990)	Fitzgerald et al. (1991)	Fisk et al. (1993)	Horn-gren (1995)	Berry & Yadav (1996)	Laroche et al. (2001)	Zeit-haml et al. (2013)
Intangibility	X	X	X				X	X
Perishability				X				X
Heterogeneity			X	X				X
Labour intensity	X				X	X		
Simultaneity	X		X					X
Inseparability				X				
Customised output	X							
Customer participation	X		X					
Difficulty in measuring output		X				X		
Joint cost a higher percentage of total cost		X						
Difficulty in linking output-related activities		X						
All costs are period costs						X		

Zeithaml et al., 2013). Further distinctive characteristics of services include labour intensity (Horngren, 1995; Pirrong, 1993; Berry and Yadav, 1996), simultaneous production and consumption (Bowen et al., 1989), inseparability (Fisk et al., 1993), customised output (Bowen et al., 1989), difficulty in measuring output (Rotch, 1990). Based on the number of customers processed daily, Fitzgerald et al. (1991) distinguish between three types of service organisations: professional services (tens of customers/day), service shops (hundreds of customers/day) and mass services (thousands of customers/day). Service firms in general, and professional service firms in particular, are often smaller in size than manufacturing firms, and most service products are non-standard and customised using non-routine technology (Brignall and Ballantine, 1996). Lambert and Whitworth (1996) argue that irrespective of such differences, the service cost dimension is the most crucial for profitability.

Costing Implications of Differences between Goods and Services

Inventoriability of the end product separates service entities from manufacturing entities. While service products are consumed immediately and cannot be stored, goods

manufactured by manufacturing firms can be stored. However, Sheridan (1996) argues that service costing should be much easier because of the absence of stocks and work-in-progress. Simultaneity of the production and consumption of services has the potential to influence costs through the redesign of a service product subsequent to interaction of the service provider with the consumer. In the same way, most labour and overhead costs incurred by merchandising companies result from providing assistance to customers. These costs are normally treated as general, selling, and administrative expenses rather than being accumulated in inventory accounts. Indeed, merchandising companies are often viewed as service companies rather than as being in a separate business category. Fitzgerald et al. (1991) identify five factors that can have implications for service product costing: the presence of the customer during the service delivery process; the intangibility of the service product; the heterogeneity of performance of service personnel and customers' service expectations; the perishability of most services; and the simultaneity of service production and consumption.

From a costing perspective, service businesses differ from manufacturing businesses as

follows: (a) almost all costs are period costs; (b) the output is difficult to measure; and (c) service industries are typically labour intensive with most of the labour fixed, at least in the short-term (Berry and Yadav, 1996). Service organisations are characterised by the perishable nature of the services they render that cannot be stored although some service businesses might have some incomplete (work-in-progress) work at the end of the accounting period (Drury, 2012).

Another consideration relates to non-standard services, for which costing-based prices are often determined after the service transaction is completed. Cost estimates are needed only when the service provider has been asked to provide a quotation. Given such differences between goods and services, the question we are faced is whether such differences warrant a separate costing system for services.

Do Services Need Another Costing System?

Dearden (1978) acknowledges that although management control systems are generally applicable to manufacturing and service industries alike, cost accounting principles are not, for two reasons. First, service industries differ so widely in their production processes that no universally applicable set of techniques is possible. Second, the problems of developing techniques to control costs and calculate profitability are much more intractable in service industries. Whitt and Whitt (1988) concur with Dearden (1978) highlighting the need for separate management accounting system for professional services. Hussain and Koch (1994) also lend support to Dearden (1978) and Whitt and Whitt (1988) suggesting that traditional accounting systems are inadequate to meet the needs of service functions because they ignore the flourishing investments and expenses in an organisation's service functions.

Opponents to separate costing system for services include Rotch (1990) and Ruhl and Hartman, (1998) who argue that despite differences between goods and services, service firms and manufacturing firms still have similarities, in that service benefits drive activities that cost money (Rotch, 1990).

On the other hand, Drury and Tayles (1998)

adopt a different position by contending that companies should not be required to choose between traditional and ABC. Instead they recommend categorisation of cost systems by the costs which are assigned to cost objects and the level of sophistication that is used to assign joint costs to cost objects, because there is no ideal single costing system and choice depends on individual circumstances. In a similar vein, Chea (2011) posits that service organisations face competitive challenges similar to those faced by manufacturing businesses, and as such, they need to make necessary modifications in their cost systems to remain competitive.

Capability of Cost Systems to Provide Accurate Cost Information

In the early 1900s, Church (1910, p.6) accentuated the importance of cost information by stating,

“It is very important that costs should not be regarded as something that may be manipulated, nor should they be thought of as representing anything but the cold truth, however unwelcome that may be”.

Almost sixty years later, Wilson (1972) drew attention to the overall inaccuracy of service costing. Drucker (1995) alleged that service industries (including banks) have practically no cost information at all. One wonders why we have not experienced improvement in service costing over this period. The findings of Ernst & Young / Institute of Management Accountants (E&Y/IMA) survey in 2003 are consistent with that of Cooper (1989), who reported that cost accounting systems of many companies (*manufacturing and non-manufacturing*) are inadequate and they give managers incorrect costing information, and they inundate managers with irrelevant cost information or they fail to measure the things that really count.

Getting the cost right is important for any organisation for four principal reasons. First, as cost-based pricing is still the most widely used method for pricing, the final price of a product or service is largely dependent on the total product cost (Mills, 1988; Ruhl & Hartman, 1998). Second, product costs are used to determine each product's performance

and profitability (Brignall et al., 1991; Ruhl and Hartman, 1998). Third, accurate product costs help firms distinguish between profitable and unprofitable products (Drury and Tayles, 1994). Fourth, accurate product cost information is essential for decisions relative to product introduction and capital allocation (Worthy, 1987). Anderson and Narus (1995) note that most companies do not even know the cost of their services. In support of Jones (1999) who reports incorrigible complexity in health care costing, findings of the research into costing health care services in the UK by Northcott and Llewellyn (2002) corroborate not only the lack of reliability of cost data in the National Health System database in the UK, but also highlights the presence of substantial and widespread costing problems in this sector.

According to a survey of management accountants conducted by Ernst & Young / Institute of Management Accountants in the USA in 2012, cost reduction and generating cost information were ranked as the two principal priorities for management accounting, with all respondents indicating that costs are distorted in some manner, and 35-45% indicating that cost accuracy is significantly impaired (Linton and White, 2012). About 34% of respondents of the E&Y/IMA survey were from service organisations. Eight-four per cent of respondents to the survey stated that the current economic downturn generated a greater demand for more accurate costing.

It is contended that overhead cost allocation, in particular, can systematically distort not only product costs in manufacturing organisations but also in service businesses and consequently, inaccurate cost data may result in poor decisions (Wang et al., 2010). Whilst accurate costing is desired by most firms, Fisher and Krumwiede (2012) point to the excessive cost of achieving this objective relative to anticipated benefits.

Cost Structure of Service Firms

Direct vs. Indirect Costs

Although several studies examine the cost structure of manufacturing organisations, there is very little literature on the cost structure of service firms. Brignall et al. (1991) examine

costing practices at five different service organisations (a management consultancy, a hotel chain, a bank, a newsagent chain and a transport company) in the UK and report that most hotels have a high proportion of fixed costs, with approximately three-quarters of the total cost of running a hotel being fixed and uncontrollable. Lovelock et al. (2011) also argue that service firms have relatively high levels of fixed costs and relatively low levels of variable costs.

Furthermore, in service industries, it is harder to separate costs into their fixed and variable components, and the presence of relatively large amounts of joint costs and interrelated products in a typical service industry makes it more difficult for most service firms to identify unique costs for individual services (Dearden, 1978). Drury and Tayles (2005) find that the average proportion of indirect costs for the financial and commercial organisations was 48% with 28% for the remaining organisations (manufacturing, retail, service and conglomerate). A survey by Al-Omiri and Drury (2007) finds that direct costs in financial and commercial businesses and service industries comprise 49% and 68.1% of total costs, respectively. The proportion of indirect costs is 51% in financial and commercial businesses and 31.9% in service businesses.

The distinction between product and period costs has no relevance in service organisations (Dearden, 1978). Friedl et al. (2009) survey 250 of Germany's largest companies, 22% of which were service firms, in terms of annual revenue and find that the service sector has on average 846.9 types of costs, while the industrial sector has the highest number of cost types (1071.4), the insurance sector has the lowest (345.5), with the banking sector (827.6) and retail (638.5) having intermediate numbers of cost types.

In 2003, Ernst and Young (E&Y) and Institute of Management Accountants (IMA) surveyed 2000 IMA members on their use of management accounting tools. The results indicated that total overheads for all sectors surveyed range between 34-42% of total operating costs. As a proportion of total operating costs, operating overheads constitutes 17%, in telecommunications and media firms, 16% in finance and insurance firms, and about 20% in utility firms. Sales, general expenses and administration overhead

makes up 25% in telecommunications and media firms, 22% in finance and insurance firms and 18% in utility firms. Manifestly, our current knowledge about cost structure of service firms is not only outdated but is also incomplete and scattered.

Absorption vs. Variable Costing

Mills (1988) stresses the use of full costing in service industries is not as straightforward as it is for manufacturing businesses. Mills (1988) also reports that 65% of service firms use absorption costing as the primary cost method as opposed to 71% of manufacturing firms. The proportion of Greek hospitality industry that employs absorption costing is 66% with 34% using variable costing (Pavlatos and Paggios, 2009). Brignall et al. (1991) report that three of the five companies they examined did not use full costs (*absorption costing*) for pricing decisions, primarily because of the difficulties in tracing costs and the competitive strategies used by those firms. Schlissel and Chasin (1991) point out that although there is evidence that service firms often favour an absorption approach for pricing, this approach is not appropriate because of the small proportion of variable costs. Findings from surveys regarding the use of variable costing and absorption costing are mixed and outdated.

Treatment of Joint Costs

A joint cost is described as the cost incurred to produce two or more outputs from the same input (Zimmerman, 2009). Hamlen et al. (1977) describe joint cost allocation as a perpetual problem faced by accountants because of management's desire for full product costing for pricing and divisional or product performance evaluation. Like other cost allocations, joint cost allocations are at best arbitrary (Thomas, 1969; Hamlen et al., 1977; Kaplan, 1977). Dearden (1978) also adds that the presence of relatively large amounts of joint costs and interrelated products in the typical service industry makes it more difficult for most service firms to identify unique costs for individual services.

The literature on joint costs generally relates to the methods of calculation. Joint costs and by-product costs create especially difficult cost allocation problems. By definition, such costs relate to more than one product and cannot be

separately identified with an individual product. An assessment of joint costs for services requires a distinction between two key types of contexts. In some businesses, e.g. manufacturing, joint costs are incurred up to the split-off point after which costs can be separated out.

Although joint cost allocation is a problem, particularly in manufacturing firms, joint costs also exist in service firms in the form of administrative and marketing costs (Hamlen et al., 1977). As indicated earlier, the fundamental problem associated with allocation of joint costs is that it is often arbitrary. Services may constitute part of the product cost, and for analysis, product and service costs may then be required to be split.

In purely service organisations, e.g. education, insurance, and finance, there should be two approaches to assessing joint costs in services. Kaplan (1977) claims that 'any allocation of joint costs – including overhead and depreciation over time – is not only arbitrary and but also fails to serve any useful purpose'. Zimmerman (1979) even proposes that research is needed to explore why firms continue to allocate costs despite suggestions from the accounting literature that cost allocations should be avoided. In service businesses, joint capacity cost represents a high proportion of total cost and is difficult to link to output-related activities (Rotch, 1990).

Mills and Cave (1990) explore cost allocations in telecommunication industry in the U.K. pointing to the relatively large amount of joint costs in interrelated products in the typical service industry. They further criticise the practice of some companies that allocate those joint costs to products as it served no practical purpose.

The contribution approach suggests that overhead costs associated with joint costs should be treated as a charge to the aggregate of profits from all products that use the joint service (Bromwich and Bhimani, 1994). Drury and Tayles (1998) suggest the use of ABC to measure accurately the cost of joint resources used by products especially where the number of products is large.

Overheads and Overhead Allocation Problems

The overhead debate has a long history. Clark (1923) comments that overhead costs are found in all industries, in agriculture and in service trades and predicted that overhead costs would likely to grow in importance as time goes by. In contrast, Edwards (1937) opposes this view because overhead allocation coupled with fixed and variable costs could cause confusion and he suggested that where overhead allocation is required it must be made in the least arbitrary manner. Drucker (1963) argues that it is the number of transactions rather than the number of units that drives overhead costs. Thomas (1974, p. xiii) then adds that “accounting had no defensible theory of allocations, that the allocated magnitudes (i.e. depreciation) reported in financial statements were irremediably arbitrary, and that this problem was severe enough that accountants should cease to allocate, and instead, should prepare reports that they can defend”.

While agreeing that cost allocations suffer from incorrigibility and arbitrariness, Eckel (1976, p. 776) proposes that rather than ceasing allocations, “accountants should use market values in an allocation-free manner, and avoid arbitrariness through uniformity by redefining the objective of the income measurement process so as to provide for unique-yielding, objective-satisfying algorithms”. Zimmerman (1979) also concurs that cost allocation has been a pervasive topic in accounting for over 75 years. Difficulties in overhead allocation devolve from the diversity of services, which makes them hard to define and difficult to use in cost analyses (Mills and Cave, 1990). Knowing that cost allocations are arbitrary, then why firms continue to practise cost allocation is a topic for examination. Brignall et al. (1991) find that overhead costs constitute a small proportion of total costs and are allocated based on direct labour hours.

Pfaff (1994) attributes the continued use of cost allocations to restraint on full costing for pricing, for inventory valuation and finally to the ignorance of managers. There is no doubt that cost allocation remains a contentious topic in management accounting. Overhead is becoming an increasingly large component of product costs, and therefore may cause

distortion in traditional volume-based costing methods. Doost (1996) investigates cost allocations in university setting, and suggested that not allocating costs should be considered as an alternative except for services that lack regularity. When cost allocation is less arbitrary and users of services have a share of costs that they need to absorb, the measures of accountability and cost consciousness are increased (Doost, 1996). Lamminmaki and Drury (2001) survey New Zealand and United Kingdom manufacturing firms and find service/support department costs are allocated to products using a single plant-wide rate (46% of NZ firms and 27% of UK firms); they apportion charges first to production departments and then to products using departmental overhead rates (45% of firms in both NZ and UK). Another method used by 21% of UK firms and 9% of NZ firms is by charging service/support department costs to products using a separate overhead rate. As Hussain and Gunasekaran (2001) point out, overhead costs often constitute a substantial part of the total costs in service firms, and it is essential to identify cost drivers and allocate accurate overhead costs accordingly.

The determination and allocation of costs is a particularly problematic task in service organisations because of the difficulties of how to assign fixed costs (Lovelock et al., 2011). A recent survey of management accountants in the USA by Ernst and Young and Institute of Management Accountants revealed that all (100%) respondents believed that overhead allocations underlie distorted cost information with 40% rating the level of distortion as ‘significant’ and the rest ‘mild’ (Clinton and White, 2012).

The same survey also showed that 12% of respondents rejected using overhead allocations and 18% found overhead allocation irrelevant as a product costing tool. E&Y and IMA survey also revealed that while in 2003, 78% used overhead allocation, dropped to 41% in 2012. In the same vein, in 2003, 40% of the firms considered overhead allocations; in 2012 this fell to 20%. Although Clinton and White (2012) has not provided any interpretation or explanation to such drastic falls, understanding possible reasons that underlie lack of interest in overhead allocation is important, and as such, warrants further study.

Cooper and Slagmulder (1998) label the arbitrary allocation of corporate support costs to the operating units as a ‘peanut butter’ approach. The outcome of such a simplified approach is both low accuracy and zero transparency. On the other hand, transparency ensures that both sides understand the source of those costs, while accuracy ensures that costs are identified and transferred properly.

Davis (2001) claims that most companies allocate overhead costs back to user departments on a formula basis, such as by head count, as a percentage of direct labour dollars, or as a percentage of company sales. As a result, most user divisions or departments pay the same amount regardless of how much they use the service. In fact, E&Y/IMA (2003) demonstrate that operating and sales, and general and administrative overheads constitute 34–42% of operating costs across all industries. Thirty per cent of respondents in E&Y/IMA’s (2003) survey reported that cost distortions present in the cost data are attributable to inappropriate overhead allocations. The survey also found that, banks, hotels and the chain of newsagents did not allocate all costs to individual services.

Applicability of Activity-based Costing to Services

Activity-based costing which was described by Johnson (1990) as one of the most important management accounting innovations of the twentieth century, raised expectations that it was the method that could put an end to inaccurate overhead allocation problems. ABC

involves identification of both volume-sensitive and non-volume-sensitive overhead cost drivers (usually between 6 and 12 drivers) and tracing indirect costs to each driver. This is followed by setting the percentage of drivers consumed by each service product. Developers of ABC (Kaplan and Cooper, 1998) suggest that service companies are ideal candidates for ABC, even more so than manufacturing companies. Drucker (1995) envisages that ABC would have its greatest impact on services. Several researchers (Rotch, 1990; Chaffman and Talbot, 1990; Antos, 1992; Bussey, 1993; Geri and Ronen, 2005) propose using ABC for service industries, while others (Lowry, 1990; Ruhl and Hartman, 1998) doubt the applicability of management accounting tools in service industries. Ruhl and Hartman stress the difficulty in implementing ABC in service businesses because of the variability of employees’ work on projects with respect to days and hours worked for various projects.

Horngren (1995) reported that he does not know any consulting firm that use ABC while consulting firms continue to use a single cost allocation base (direct labour) and yet push their clients to use ABC. This is interesting given that the very same firms provide consultancy services to clients on how to implement ABC. Horngren (1995) also adds that Japanese companies appeared to show no interest in ABC despite being successful international players. However, since Horngren made this observation in 1995 successful ABC implementations in service companies have been reported (Table 2).

Table 2: Examples of Successful ABC Implementation in Service Industries

Context	Author(s)
Financial services	Sharma (1992), Innes and Mitchell (1997), Cross and Majikes (1997), Ashorn et al. (2003), Byerly et al. (2003), Kocakülâh (2007), Carenys and Sales (2008)
Healthcare	West and West (1997), Baker (1998)
Hospitality	Dalci et al. (2010), Vazakidis and Karagiannis (2011)
Information Services	Neumann et al. (2004), Kocakülâh et al. (2012)
Insurance	Norkiewicz (1994)
Library services	Goddard and Ooi,1998, Ellis-Newman (2003)
Marketing	Kuchta and Troska (2007)
Restaurants	Raab and Mayer (2007); Raab et al. (2009)
Telecommunications	Hobdy et al. (1994), Dorey (1998), Pike et al. (2011)
Transportation & logistics	Bremser and Licata (1991), Baykasoğlu and Kaplanoğlu (2008)

As shown in Table 2, most of the studies demonstrate successful implementation of ABC in the services industry with only a handful studies (Norris and Innes, 2002; Eden et al. 2006; Abdallah and Li, 2008); that left users of ABC with a less than satisfactory experience. Despite some documented successful applications of ABC in service industries, judging from the reported adoption rates of ABC, it appears it is too early to claim that management accounting has finally found the magical method that could end its long-lasting overhead allocation problem.

Table 3 below shows ABC implementation rates by service firms. Analysis of Table 3 suggests that the take-up of ABC by service firms is greater than that of manufacturing firms overall. However, whether the current adoption rates are satisfactory is subject to interpretation. Although few longitudinal studies have been carried out, if the survey of Innes and Mitchell (1997, 2000) is a guide, the decline in adoption over the 5-year period (in

non-manufacturing business from 18.9% in 1995 to 12.1% in 2000 and in the financial services sector from 54.0% in 1995 to 40.7% in 2000) is noteworthy.

On the other hand, however, ABC and activity-based management are viewed as interesting and significant phenomena worthy of study in their own right (Hopper et al., 2001). Berts and Kock (1995) note that ABC should be considered by service firms where cost of activities is not too small or the activities are not too complex. They also stress the importance of the information used in the ABC analysis. Lucas (2000) observes that ABC has made the most impressive inroads in the service industries. Caution must be exercised when comparing the implementation rates as in some cases companies might be using costing systems of their own which is not called ABC but resembles ABC (e.g. Bussey, 1993).

Table 3: ABC Implementation Rates of Service Firms

Study	Industry	ABC implementation rate
Pavlatos and Paggios (2009)	Hospitality (Greece)	23.5%
Carenys and Sales (2008)	Banking (Spain)	30.8%
Al-Omiri and Drury (2007)	Services (UK)	33.0%
	Financial and commercial firms (UK)	68.0%
Cohen et al. (2005)	Services (Greece)	65.0%
Anand et al. (2005)	Non-manufacturing (India)	23.1%
Pierce and Brown (2004)	Non-manufacturing (Ireland)	27.8%
	Financial services (Ireland)	11.1%
Cotton et al. (2003)	Non-manufacturing (New Zealand)	18.8%
	Financial services (New Zealand)	8.0%
Krumwiede and Leikam (2002)	Non-manufacturing (USA)	25.0%
Clarke and Mullins (2001)	Non-manufacturing (Ireland)	19.0%
Innes et al. (2000) - 1999 survey	Non-manufacturing (UK)	12.1%
	Financial services (UK)	40.7%
Innes et al. (2000) - 1994 survey	Non-manufacturing (UK)	22.0%
	Financial services (UK)	54.0%

Time-Driven Activity-Based Costing (TDABC)

According to the Kaplan and Anderson (2004), ABC fell short of expectations in regard to widespread adoption because ABC failed to capture the complexity of businesses' operations, took too long to implement, and was too costly to build and maintain. As a

result, they devised Time-Driven Activity-Based Costing which in their opinion was capable of addressing the shortcomings of ABC. Pernot et al. (2007) carry out a case study at the library of Katholieke Universiteit Leuven in the Netherlands to examine the implementation of TDABC in the inter-library loan system at KULEuven Arenberg Library. The implementation was successful and Pernot

et al. (2007) report that TDABC made possible provision of inter-library loan services at a lower cost and that this led to disaggregation of per-transaction costs based on activity analysis. Cardinaels and Labro (2008) find that 77% of respondents consistently overestimated by an average of 37%. This is a profound hurdle for successful implementation of TDABC which uses time estimates. A case study by Stouthuysen et al. (2010) at a Belgian university reports successful implementation of TDABC to library acquisition which was able to calculate minimum and maximum cost of the acquisition process, provided better information relating to cost drivers and highlighted process improvements.

However, Ratnatunga and Waldmann (2010) show how inappropriate TDABC was, when the Australian Government used this methodology to allocate research time in universities. Further, a longitudinal case study conducted by Gervais et al. (2010) found that TDABC failed to give due consideration to the required regular maintenance of the system and questioned the accuracy of time estimations and consequent reliability problems. It was the contention of Gervais et al. (2010) that the improvements made on ABC failed to render TDABC a better system. What makes Gervais et al.'s (2010) study interesting is that the company that they chose for the case study was one of the first companies to have implemented TDABC in continental Europe in 2004. In a service context, Gervais et al. (2010) points to the unpredictability and irregular nature of service demand, and therefore they do not consider putting a value on underactivity a necessarily important advantage. Somapa et al. (2012) conduct a case study to examine TDABC implementation in a small-size transportation and logistics company and found that overall the company benefited from the implementation of TDABC particularly in obtaining accurate cost information pertaining to service routes and that TDABC also disclosed inefficiencies and potential areas for cost reduction. Like Gervais et al. (2010), Somapa et al. (2012) also point to the difficulties in time estimations when using TDABC.

In the manufacturing context, case study carried out by Ratnatunga et al. (2012) it was demonstrated that there was no difference between ABC and TDABC where standard

activity times were used as cost drivers. In contrast to Hoozée et al. (2012) who report increasing acceptance enjoyed by TDABC, Ratnatunga et al. (2012) also predict that TDABC will result in fewer implementations sustained than ABC has managed. Hoozée, et al. (2012) develop a model to quantify the trade off between identification error and estimation errors on the inaccuracy of estimated transaction times.

Conclusions and Suggestions for Future Research

The premise of this paper was to highlight the challenges and specific costing issues that service industries have been facing for years, and call for research into this area. In the light of the increasing importance of the services sector globally, service costing continues to be a relatively little-researched area of management accounting, and the need for future empirical research on costing in service setting remains. While acknowledging sporadic improvements in service costing over the past two decades, most managers are still unsure of the reliability of cost data provided to them for making decisions. Managers have the unenviable task of making strategic decisions day in and day out based on cost data in which they have little confidence. Furthermore, judging from the trend in adoption rates, ABC does not seem to have lived up to expectations in resolving the overhead cost allocation problem. The current view, which posits that overhead costs constitute a substantial portion of total costs in service firms, further complicates the overhead allocation problem. Scant research on the ubiquitous cost allocation problem points to the need for further research to ascertain the proportion of overhead costs in various service sectors and to trace the trend over several years. Current knowledge about cost composition in service firms is restricted. Brignall et al. (1991) pinpoint the need for further research to ascertain if cost structures in some services are moving toward a higher proportion of fixed indirect costs. The lack of a starting point in this regard impedes the identification of any trend. The association between the adoption of activity-based costing (ABC) and enterprise resource planning systems and accuracy of costing information also merits further investigation. The task ahead of researchers is not easy, but it is about

time that management accountant researchers shift their focus to understanding costing in service industry and attempt to resolve the existing costing problems. Future research should not only investigate and describe the current practices, but should also attempt to comprehensively identify the key costing challenges. A major limitation of this paper is that findings resulting from a review of the literature are based on the relatively limited amount of research that has been conducted on service costing.

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