Diffusion of Activity Based Costing (ABC) in Australian Universities: An Exploration of Drivers and Barriers of ABC Adoption

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LIST OF ABBREVIATIONS

AASB	Australian Accounting Standards Board
ABC	Activity Based Costing
AEN	Australian Education Network
ASA	Association of Social Anthropologists
ATN	Australian Technology Network
BSC	Balance Scorecard
CDU	Charles Darwin University
CFO	Chief Financial Officer
DBA	Doctorate in Business Administration
EFTSL	Equivalent Full Time Students
FTE	Full Time Equivalent
GAAP	Generally Accepted Accounting Principles
IASB	International Accounting Standard Board
IFRS	International Financial Accounting Standards
IRU	Innovative Research Universities
IT	Information Technology
JIT	Just-in-Time
MAS	Management Accounting Systems
NBAC	National Bioethics Advisory Commission
NGU	New Generation Universities
PMM	Performance Measurement and Management
SEC	Securities and Exchange Commission
SEM	Strategic Enterprise Management
TPA	Toyota Production Systems
TQM	Total Quality Management
VET	Vocational Education and Training

ORIGINALITY OF DISSERTATION

I hereby certify that except where otherwise acknowledged, this dissertation described original research carried out by the author. This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published except where due reference is made in the dissertation itself.

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ABSTRACT

This study examined the implementation of Activity Based Costing (ABC) as a cost allocation tools within the public universities in Australia. Universities play a vital role in Australian society. They are important to the prosperity of Australia through their contribution to human and social capital.

The traditional methods of cost allocation both globally and in Australia have been used extensively in management accounting for over a century. Accounting researchers however acknowledge the limitation of the traditional methods. It is widely accepted that traditional methods do not provide management with accurate cost allocation information, particularly in organizations that offer multiple products and/or services. ABC has emerged as one of the most important contemporary innovations in accounting. It has the merit to assist organisations in managing competitive complexity by gaining a greater understanding of their costs. It supports quality information for good management in all aspects of organisational operations and functions.

Although cumulative ABC research is expanding, there is limited evidence to indicate the extent of ABC use in Australian universities. The role of ABC in Australian Universities has remained unanswered. As a result, this study aimed to explore three questions in the context of public universities in Australia: ABC diffusion, motives and barriers of adoption.

The study employed a sequential exploratory mixed methods research design to answer these questions. All public universities were invited to participate in this study. With an effective response rate of more than 60 percent, the study generated valuable insight into the research questions. The result from the quantitative and qualitative data analysis identified the key motives and barriers to ABC adoption. The study highlighted the critical role of senior management in driving ABC adoption as a cost allocation tool. The findings indicate that a large proportion of Australian Universities have positively accepted ABC as a costing tool.

This is particularly noticeable for the larger universities. The study found out that there is not much difference in terms of institutional characteristics such as location. Fifteen (15) of thirty-nine (39) university presently use ABC and a few others are committed to retry ABC in the future.

In terms of institutional size however, ABC implementers are dominated by larger universities measured by number of employees and annual turnover. The implementing institutions are members of either IRU or G8 categories. The non-users (rejecters) of ABC are smaller universities both in terms of their financial turnover and number of employees.

ABC related research in the higher education sector is rather new. Cropper and Cook (2000) for example investigated ABC in British universities and reported high level of dissatisfaction. By the turn of this century, more studies in ABC related to universities were published (Henderson & Brown 2001; Kinsella 2002; Mensah & Werner 2003; Lewis & Styles 2004; Reich & Abraham 2006). However, the research topics covered were limited in scope. Given the context of limited ABC research in the higher education sector of Australia, this research makes a significant contribution to our understanding by exploring some of the fundamental issues of ABC diffusion, the key drivers and the barriers perceived by the users and non-users in Australia.

CHAPTER 1

INTRODUCTION

1.1 Background Information

This chapter provides a brief overview of the thesis and contextual background to this study. The study sought to explore Activity Based Costing (ABC) diffusion in Australian Universities. The key research question the study sought to address was:

> "To assess the extent of ABC adoption in Australian Universities. Also to investigate the motives and barriers to ABC adoption."

The chapter commences by providing a background to the research and then presents the statement of the problem. As the geographical scope of this study is restricted to Australia, a brief overview of the higher education environment related to this sector is provided. This is followed by a description of the study's specific objectives. Chapter 1 concludes with an outline of the structure for the remaining chapters of the thesis.

1.2 Context of the study

The 'changing accounting practice' provides the backdrop and context of this study. Historically accounting innovations of truly global appeal have been few and the adoption of new tools and practices rather slowly – unless the innovative tools and practices are either mandated by legislation or endorsed by the professional bodies.

The emergence and adoption of ABC as an innovation therefore provides an interesting research scenario.

1.3 Activity-based Costing (ABC)

As a solution to the overhead allocation problems experienced particularly by 'multi-product' operators, Activity-Based Costing (ABC) began to develop in 1980s (Johnson & Kaplan 1987). It is acknowledged as a comprehensive approach to address the cost allocation challenge. However, the inherent complexity of the tool has hindered its rapid and widespread adoption by a large number of organisations (Rogers 2003). ABC focuses on the 'activities' that generate the costs and not on the financial information related to business transaction only (Manalo & Valenzuela-Manalo 2010). ABC is accepted as a rigorous methodology of costing and cost allocation than traditional methods. It is designed to improve the accuracy of costing and identify areas for improvement in a wide range of organisational processes (Chwastyk & Kolosowski 2009).

The new perspective provided by ABC has allowed management to address multiple concerns: (1) identify inefficient or avoidable activities within the organisation, (2) explore opportunities for cost reduction and (3) achieve production efficiency (Moore 2000). The common denominator of ABC effectiveness in all scenarios is the generation of more accurate cost information to facilitate effective strategic decision-making. As stated by Gunasekaran & Sarhadi (1998, p. 231-232), ABC adds rigor to tracing costs of activities performed thereby giving more accurate cost information with less distortion.

It is now widely acknowledged that activity-based costing (ABC) is one of the most important contemporary innovations in accounting (Bjornenak 1997; Cropper & Crook 2000). Similar views were shared by Chenhall and Langfield-Smith (1998, p. 248) as they maintained that ABC is one of the most prominent developments in management accounting as it provides "potentially powerful mechanisms" to assist decision makers understand their costs.

Some professionals viewed the impact of ABC as a paradigm shift in accounting practice. ABC and the related activity-based management processes have generated a profound transformation in accounting thought related to cost management theory and systems and pertain uniformly to a wide range of organisations including service companies, government agencies as well as manufacturing organisations (Edwards 2008). ABC as a cost allocation system is rich in data and particularly useful for organisations where products and services are manufactured and/or assembled internally. Governments, not for profit organisations and universities fall into this category as most of their services are created within (Gunasekaran et al. 2005).

The benefits of valid, reliable and timely information as a critical input in strategic decision-making are numerous and well acknowledged. With ABC's promise to deliver on this benefit, it can be argued that ABC adoption should proceed without any resistance. However, the ground reality is that many organisations continue to use the well-entrenched practices despite the stated facts that support new tools and approaches such as ABC. As the bastions of knowledge creation, it is further argued

that the incidence of ABC diffusion as a means of sustained governance improvement is likely to be significant.

The nature of operating environment of Universities provides further support to the diffusion argument. In recent years, market and supply chain complexity has increased significantly for universities in general. These competitive challenges signal the need to be proactive and responsive to maintain competitive advantage. The changes in organisational accounting practices therefore have become a relevant research topic – particularly to sustain and facilitate strategic decision-making. Whilst there is better appreciation of ABC in the manufacturing sector, little is known about the services sector practices in particular the approach of Australian Universities towards ABC.

1.4 Statement of the problem

As argued previously, inaccurate cost data has driven the need for greater sophistication in cost allocation and has become a growing concern for strategic decision makers in a wide range of sectors (Maelah et al. 2011a; Melese, Blandin & O'Keefe 2004). Inaccuracies in costing can have serious consequences in making appropriate management decisions. Quality information for example, is essential to make decisions such as whether to continue or discontinue programs in the context of Universities (Brown, Myring & Gard 1999). Similarly, course pricing is another key area of interest to Universities that needs proper cost allocation systems. University managers need cost information on courses that are necessary to be

offered whether or not the course revenues adequately cover variable costs (Cropper & Drury 1996).

A review of the domestic and international literature highlights that globally, ABC is establishing itself as a sound and robust cost allocation tool. Many studies have documented the application of ABC to investigate a range of issues. For example, 'Better understanding of costs' (Edwards 2008; Reich & Abraham 2006; Simmons, Wright & Jones 2006); 'Customer profitability analysis' (Cokins 2015; Guilding & McManus 2002) and 'Supply chain management' (Askarany, Yazdifar & Askary 2010) and so on.

Despite the limitations of the traditional approaches, it is only in the last couple of decades that the ABC diffusion received sustained research attention by governance and accounting researchers. However, there is no systematic empirical study to investigate the adoption of ABC in a large number of service dominant organisations including the higher education sector – the Universities. A review of the literature indicates that there is no identified study that explores ABC in the not for profit services sector. The vast majority of empirical studies investigating ABC have predominantly focused on commercial organisations in the manufacturing sector.

In view of the foregoing, the purpose of this research is to investigate the extent of diffusion of activity-based costing (ABC) in Australian Universities. The literature provides a window into the positive aspects of ABC and the limitations of traditional methods. Although traditional methods have been extensively used in management

accounting for over 100 years, its limitations have been a concern of the practitioners. Activity-based costing (ABC), introduced in 1988 by Cooper and Kaplan, is a system or methodology used in situations where the information provided by traditional methods has either provided management with incorrect information or limited information that may be required for appropriate decisions making.

Given the facts that (a) ABC diffusion has not been adequately explored in the Universities and (b) the significant contribution made by Australian Universities collectively, this study examines the extent of diffusion of Activity Based Costing (ABC) methods and their uses in Australian universities. The three objectives of this study are:

1. To determine the extent of ABC implementation in Australian universities
2. To examine the reasons for the adoption of ABC in Australian Universities
3. To examine the reasons for not implementing ABC in Australian universities

The focus of this research investigation is specific and sharp, restricted to public funded universities operating in Australia.

1.5 The Australian Context

It is widely acknowledged that Universities are important to the prosperity of Australia through the building of human and social capital. They organise teaching and learning activities and have direct contact with students who will be the future leaders of Australia (Deloitte 2015). Technological progress and economic growth

are powered by research conducted at universities to discover new technologies which lead to the adoption of new ideas and new practices in both private and public organisations. Universities in Australia provide leadership in the development and education of more productive workforce as employees and as future business owners. According to Deloitte's 2015 study (p. ix), "education and training is amongst the top five industries that are expected to require increased number of skilled graduates over the next ten years."

The operating environment of universities however has changed drastically in recent time. In the Australia context, the continued reduction of university funding from the Commonwealth, which many believe will continue in the foreseeable future, is critical for the ongoing viability of public funded universities. With the intense competition within the Australian universities sector for both domestic and international students in both higher education and vocational programs, university management needs as quality financial information for effective decision-making. Universities worldwide are making an effort to balance the ever-changing funding availability along with the increasing costs of their programs (Simons, Wright & Jones 2006). Universities therefore need to have an uncluttered understanding of the influence of the reasons or drivers of cost factors (Brown, Myring & Gard 1999; Edwards 2008; Goebel, Marshall & Locander 1998; Henderson & Brown 2001). This is critical so as to decide where their limited resources are best invested to achieve their desired goals and outcomes.

This study will be a descriptive research project. The primary purpose of this study as previously stated is to determine how activity-based costing (the phenomena) is being used in Australian universities. In addition to determining the presence of the phenomenon, this study explores the level of implementation of activity-based costing (ABC). It is expected that many of the Australian universities have chosen to adopt/use or investigate activity-based costing (ABC) and have experimented with its use as a decision-making tool. As per Cohen, Venieris & Kaimanaki (2005) there were enterprises using ABC (adopters), enterprises that were investigating or intending to transit to ABC (supporters), have chosen not to use ABC (deniers), and those who did not know about ABC (unawares). Universities as large professionally managed organisations, this study attempts to identify universities into two broad categories (a) adopter/implementers, attempters, and (b) those that have chosen not to explore ABC methodologies (rejecters).

1.6 Outline of the thesis

This dissertation is structured in five chapters. Chapter 2 commences with a review of the relevant literature to establish the foundation for the arguments in the subsequent chapters. Next, chapter 3 discusses the methodological approach used in the study. Since the research is a sequential mixed methods design, analysis of data considers both qualitative and quantitative responses. The results and data analysis are provided in chapter 4. It compares the results of the analysis of data with the findings in the literature review. Chapter 5 then presents the conclusion, implications for policy and practice, and the limitations of the study as well as

providing suggestions for further areas of research. Brief overview of the four remaining chapters is provided below.

Chapter 2 reviews the relevant literature, which presents background information on the evolution of ABC as a contemporary tool. In this regard, the chapter examines both ABC and the conventional approaches of cost allocation used by various organisations from both the manufacturing and services sectors. This is followed by an investigation of the Australian Higher education sector and considers the competitive challenges of the environment. Finally, the chapter presents the research questions. At the end of chapter 3 there is a discussion of Institutional Theory and how it relates to the structure of this research.

Chapter 3 commences by describing the methodological approach underpinning the study. The chapter explores the appropriateness of using a sequential exploratory mixed methods research design. Next, the chapter presents details of how the participants of the study were selected, the criteria for inclusion as well as the data collection and analysis. Other items discussed include population, sample frame, non-response bias, and the survey instrument. Chapter 3 concludes by detailing ethical considerations relating to this study.

Chapter 4 communicates the empirical findings of the thesis. The primary data obtained through questionnaires is analysed by using the appropriate statistical procedures. Given the small size of the population and respondents, descriptive

statistical procedures of frequency distributions and cross-tabulations are used to understand the composition and background of respondents of this study.
The chapter provides a profile of the participants that contributed to this study. The dominant motives and barriers are identified and explained through the use of qualitative and qualitative analysis of data. The analysis also considered narratives and observations from the interviews to gain further insights into the research findings.

The chapter also presents arguments for the overall reliability of the data and findings. Summary statistics and graphs are utilised to explain the primary characteristics of the questions. Finally, chapter 4 discusses the result of the finding in relation to the research question and then compares the findings against the background of the literature reviewed in chapter two. Chapter 4 concludes with an overall discussion of the findings in the context of Australian higher education sector.

Chapter 5 brings the thesis to conclusion. It begins by re-visiting the aim of the study and the approach undertaken to fulfil the purpose of the research. It examines how the study's aim and objectives were achieved. This is followed by an overview of the research findings, which speak to the study's research questions. In addition, the chapter investigates the implications of the study's findings for policy and practice. The chapter then discusses the limitations of the study. The chapter concludes by providing recommendations for further research which may increase the likelihood

of ABC adoption in Australian universities and perhaps more widely in the services sector of Australian economy.

1.7 Summary

In conclusion of this chapter, we posit that ABC as a distinct approach of cost allocation has been researched in a limited way in many countries and sectors since the 1980's (Edwards 2008). An initial attempt to investigate ABC in the higher education sector was made in 1990s. Cropper and Cook (2000) found in their research of 1998/1999 that 83 percent of British universities were dissatisfied with current cost system and that they desired improvement. By the turn of this century, few more studies in ABC related to universities were published albeit with narrow focus (Henderson & Brown 2001; Lewis & Styles 2004; Kinsella 2002; Mensah & Werner 2003; Reich & Abraham 2006). There was for example, a moderate amount of research in the applications of ABC in university libraries (Ellis-Newman & Robinson 1998; Kont 2011; Pernot, Roodhooft & Van den Abbeele 2007; Reich & Abraham 2006) and small individual programs (Whelan 2003). In the Australian university sector, there was little research related to the more widespread diffusion of activity based costing in the tertiary education sector of Australia. This study therefore is timely and relevant. In view of the limited prior research, this study fulfils a significant gap in our understanding the role of ABC in Australian Universities. Thus, we argue that this research will make a significant contribution to the literature on ABC.

CHAPTER 2

LITERATURE REVIEW & THEORETICAL FRAMEWORK

2.1 Introduction

The purpose of this research is to determine the extent of diffusion of activity-based costing (ABC) in Australian Universities. This chapter begins with a general overview of management accounting and the traditional techniques used to assist the decision-making process. The literature provides a window into the positive aspects of traditional methods of decision-making and their limitations. Although traditional methods have been widely used in management accounting for over 100 years, its limitations have led to the development of more contemporary techniques. Activity-based costing (ABC), introduced in 1988 by Cooper and Kaplan, is a system or methodology used in instances where the information provided by traditional methods has either provided management with incorrect information needed for appropriate decisions or limited information. In the context of the limitations of traditional method, this research is about exploring to what extent ABC is used in Australian universities.

The use of ABC has been researched since the 1980's (Edwards 2008). By the 1990's some researchers were investigating the use of ABC in institutions of higher learning. Cropper and Cook (2000) found in their 1998/1999 survey that 83 percent of British universities were dissatisfied with current cost system and that they desired improvement. By the turn of this century more studies in ABC related to universities were being published (Henderson & Brown 2001; Kinsella 2002;

Mensah & Werner 2003; Lewis & Styles 2004; Reich & Abraham 2006). Although there is a moderate amount of research in the applications of ABC in university libraries (Ellis-Newman & Robinson 1998; Kont 2011; Pernot, Roodhooft & Van den Abbeele 2007; Reich & Abraham 2006) and small individual programs (Whelan 2003) in the Australian university sector, there is little research related to the more widespread diffusion of activity based costing in the tertiary education sector of Australia.

In Australia, the continued reduction of university funding from the Commonwealth, which many argue will continue in the foreseeable future could be considered critical to the survival of universities. Managers of today view the accuracy of cost information as one of the most important challenges (James & Elmezughi 2010; Raz & Elnathan 1999). With the competition between Australian universities for both domestic and international students in both higher education and vocational programs, university management needs as much quality financial and non-financial information as possible for effective decision making. Universities worldwide need to balance ever-changing funding resources and the differential costs of their programs (Simons, Wright & Jones 2006). They also need to and have a distinct understanding of the influence of the reasons or cause factors of these costs (Brown, Myring & Gard 1999; Edwards 2008; Goebel, Marshall & Locander 1998; Henderson & Brown 2001) as to where their limited resources are best invested to achieve their desired goals and outcomes.

Inaccurate cost data suggests the need for added sophistication and has become a continued growing concern (Maelah et al. 2011a ; Melese, Blandin & O'Keefe 2004) in universities as well as commercial enterprises. Inaccuracies in costing can have serious consequences in making appropriate management decisions. Quality information for example is needed to make decisions such as to continue or discontinue programs (Brown, Myring & Gard 1999). Course pricing is another key area of interest to Universities that needs proper cost allocation systems. University managers need cost information on courses that are necessary to be offered whether or not the course revenues adequately cover variable costs (Cropper & Drury 1996).

Types of costs associated with manufacturing as well as service businesses would include the costs of labour, indirect costs and overhead. For the purpose of this research, indirect costs and overhead will generally be termed as 'overhead' unless otherwise explained. Both manufacturing industries and service sectors have other costs as mentioned later.

2.2 Managerial and Cost Accounting

Cost accounting is a subset of managerial accounting. Examples of cost accounting include costing of inventory, cost of goods sold, manufacturing costs that are used in the preparation of financial statements and recording the cost of assets and liabilities. Managerial accounting is more encompassing and its use expands beyond cost accounting. Managerial accounting uses cost information to interpret accounting information for more precise decision making. Managerial accounting would include cost vs. benefit analysis of different options, lease vs. buy decisions,

expanding or contracting product lines, target costing, customer accounting, marketing**,** etc. In this chapter, generally cost and management accounting are used synonymously because the purposes of cost and management accounting often overlap.

A key objective of a cost system is to provide relevant and timely information for management in the decision-making process (Appah 2013). As per Cooper and Kaplan (1999, p. 57), the purpose of a cost system is to estimate the costs of products, services and customers. The more accurate and relevant the information provided is, the more effective and efficient the decision process can be (Brown, Myring & Gard 1999; Cooper & Kaplan 1991; Edwards 2008; Langfield-Smith 2008; Manalo & Valenzuela-Manalo 2010). However not all decisions are based on the accuracy of numbers as other factors can be involved. Organisational strategies for example often affect decision making considerations. Accurate and relevant costing information can still be useful in providing management with expected outcomes of strategic decisions.

Organisational functions such as marketing, information technology (IT), and operations, need accounting data to manage these activities. The marketing department requires accurate cost information to better price the products or services in a competitive market and to determine the best markets for their goods and services. The IT department requires accounting data to assist in controlling their service and capital expenditure costs, and operations managers need information on labour, material and overhead costs to measure the costs to produce products (Juchau

et al. 2009). The management information needed therefore goes beyond the basic purpose of a cost accounting system. ABC recognises that not all activities are directly in proportion to the number of units produced and the level of detail in ABC depends on the complexity of the projects and the degree of accuracy required (Cooper & Kaplan 1991; Raz & Elnathan 1999).

According to Cooper and Kaplan (1999, p. ix), there are three primary objectives or 'functions' of a cost management system:

1. Measure cost of goods sold and value inventory for financial reporting purposes
2. Estimate costs of activities, products, services, and customers
3. Provide economic feedback to employees and operators about process efficiency

The results of the first and second objectives should provide the users of the system to make decisions on operational efficiency by providing feedback to those that are directly involved in the process. The information is useful for managerial purposes to help identify operational strengths and weaknesses.

There are various costing methods and cost systems that can be used to achieve Cooper and Kaplan's (1999) primary objectives. Managerial accounting involves producing financial (dollars) and non-financial (numbers of units, labour hours, number of batches, etc.) information that can be used for evaluating budget variances, product and service costs per unit/batch, and to assist in the management of activities and people.

In contrast with managerial and cost accounting, 'financial' accounting systems are designed to collect data (typically in currency amounts) to produce financial

statements for external users (Awasthi 1994; Cooper & Kaplan 1991; Johnson & Kaplan 1987; Melese, Blandin & O'Keefe 2004). There are also internal uses for this information.

Australian financial accounting systems follow statutory and regulatory requirements such as those from Australian Accounting Standards Board (AASB). The International Accounting Standard Board (IASB) issues International Financial Accounting Standards (IFRS) that influence the pronouncements issued by the AASB. Financial accounting is subject to many statutory constraints. Cost accounting systems, on the other hand, are designed to collect data for cost systems and are not subject to financial regulatory restraints. Cost systems need to take into account timely feedback about actions taken by employees and should include both financial and non-financial measures. Financial measures would include costs and non-financial measures may include number of units, quality of output and cycle times in order to improve processes in their immediate control (Cooper & Kaplan 1999).

2.3 Traditional Cost Systems

In the early 19th century most manufacturing operations worldwide were small independent shops and factories where most of the costs were direct labour and direct materials (Cooper & Kaplan 1991; Johnson & Kaplan 1987). During the time of the industrial revolution, manufacturing operation needed to be consolidated into larger enterprises as the use of heavier machinery required steam or water powered systems to drive the machinery (Noreen 1987). As manufacturing operations grew

so did factory administrative services, engineering design, machinery maintenance, machinery depreciation, insurance and property taxes, to name a few. Costs incurred for these were not directly associated with the products produced: indirect costs. That is, they were more commonly known as 'overhead.' These indirect costs were not easily allocated to the items produced. Basic allocation methods were adopted to assign these increasing overhead costs to units of production based on the number of units manufactured, using labour hours or machine hours as a basis of allocation. Today we call these approaches conventional or 'traditional methods.' Traditional cost systems did not allocate costs incurred "outside" production: administration and marketing were "period" costs.

For organisations that produce a small number of unique items, traditional methods are as effective today as they were 100 years ago. However, when organisations began to manufacture dozens or hundreds of different unique products that vary in size, complexity and cost, traditional methods were not adequate when it comes to appropriate product costing. The traditional methods do not provide management with accurate information for decision making (Cooper & Kaplan 1998).

Traditional cost systems may have done an adequate job of allocating direct costs to their products and services but these methods are often weak in allocating indirect costs (Brown, Myring & Gard 1999; Cooper & Kaplan 1991; 1999; Lutilsky & Dragija 2012; Velmurugan 2010). Traditional methods apply the indirect costs and overhead using only a few 'drivers' (typically only one) such as direct labour hours (or labour cost), machine hours or number of products produced. Cost drivers are

the “events that cause changes in the behaviour of costs in the activity cost pool” (Ellis-Newman 2003, p. 335; Toompuu & Polajeva 2014). Direct costs are those costs that can be directly associated with products and services. Direct costs associated with manufacturing include materials and labour that are used to produce a unit or batch of products (Lutilsky & Dragija 2012). Indirect costs, or overhead, are costs that are necessary for the manufacturing of products but are not readily traceable to a product (Brown, Myring & Gard 1999; Edwards 2008; Juchau et al. 2009). These would include the costs of supplies, utilities, depreciation, maintenance, administration, insurance, product tracking, and other costs that not directly associated with specific products (Juchau et al. 2009). Additional costs in the manufacturing environment include for example: quality control, indirect engineering, procurement, identification and communication of specifications, certification, and the development. The recordings of relevant data, however, were not directly related to specific products or batches (Velmurugan 2010. p. 5).

In a traditional configuration, all overhead costs are accumulated in a single overhead pool (Brown, Myring & Gard 1999). The overhead costs are then allocated to products through the use of a single driver based on direct labour hours, labour costs, or using machine hours. Direct labour is the ‘volume-sensitive’ driver most used (Cooper & Kaplan 1988; Velmurugan 2010). If an operation were more machinery driven, overhead may be applied using machine hours. Although somewhat effective for allocating some types of overhead to units, it is not suitable for other overhead costs that may not be driven by machine hours or labour costs. Hence, their allocation is misleading and may be over or under applied. Over recent

decades, overhead costs have increased exponentially in relation to decreasing labour costs and increased machination (Brown, Myring & Gard 1999; Johnson & Kaplan 1987). With the changes in the manufacturing environment, a key question remains: why is the use of traditional methods so widespread?

The simplicity of the traditional cost system, not the accuracy, is what makes it so appealing to managers (Brown, Myring & Gard 1999). Traditional cost methods are sensible for gathering and assembling costs but not for converting the costs collected into accurate managerial information (Gunasekaran, Williams & McGaughey 2005; Ismail 2010; McKenzie 1999; Simmons, Wright & Jones 2006; Swenson 1995). As cited in Velmurugan (2010, p. 7) stated that while traditional costing techniques used by most organisations are not complicated to understand and employ, they are unsuccessful in realistically allocating other indirect costs.

2.3.1 Diffusion of Modern Methods in Australia

Early in the 20th century John Jensen (later Sir John) an accounting clerk for the Ministry of Defence in Victoria, Australia, introduced modern accounting practices to Australia (Foreman 2001) to use in the manufacturing of small arms in Lithgow, NSW. Although modern at the time, these methods later became known as 'traditional' methods. They were easy to understand and implement, but lack the rigor to allocate the increasing portions of overhead and indirect costs in modern manufacturing environments. Even at the time Jensen began to utilise traditional cost accounting methods there was no widespread treatment of 'overhead' in North America (Foreman 2001). The diffusion of traditional accounting approach was likely adopted promptly in Australia because it had relative advantage, compatibility,

reasonable complexity, easy to trial and the results of its use were readily observable (Rogers 2003).

2.3.2 Limitations of Traditional Cost Systems

Although somewhat effective for allocating some overhead costs to units, traditional overhead allocation methods do not account for other costs included in overhead that may not be driven by machine hours or labour costs. Weaknesses of traditional cost system can cause significant distortion in the allocation of overhead costs especially in large scale operations that have many different products and services that do not equally correlate to overhead costs (Raz & Elnathan 1999). These cost distortions can contribute to management selling goods or services at less than their actual costs or with unacceptably low margins (Simmons, Wright & Jones 2006). Distortions can also readily apply to governmental and non-profit organisation's services and products. If a government organisation under values the costs of its services, the viable option of outsourcing these services can be overlooked. Services could be selected for outsourcing improperly [incorrectly] if the organisation over values the costs of the service. Of course, in many governmental organisations, many services cannot be outsourced.

When applying overhead to product or service costs, using only a few drivers such as machine hours, direct labour hours (or costs), or the number of services rendered, or the number of products produced, one may be able to deduce that many other product related costs have not been adequately considered. These may include facility costs, office area, manufacturing area, number of machine change-overs for

different products or sizes, number of purchase orders for direct materials, engineering costs for assembly line and product adjustments and utilities that have not been included in the allocation of overhead. The fewer drivers and cost pools used creates a greater risk that the overhead costs will be allocated in a manner that does not correlate the actual costs with the driver of those costs. Hence, traditional cost systems do not include all costs related to the production of products. Traditional costing primarily includes cost to manufacture products. While this information is useful for financial reports of costs of goods sold and inventory, it ignores additional costs for managerial decision making.

Marketing costs, product development costs and advertising are real costs to get the product to the customer and these costs are necessary for product pricing. A lack of consideration of these costs would mean that there is inaccurate costing information used from the beginning. More so, traditional costing, when producing a wide range of products, can lead to an increase in distorted cost information (Cooper & Kaplan 1999) by applying all product related costs using a small number of generalised allocation drivers. Traditional drivers do not reflect the activities that 'cause' the costs and are not specific enough to trace costs accurately. Recognition of non-value added activities (storage of direct materials, moving materials, purchasing and receiving costs and packaging adds little value to the products) whereas machining, direct labour hours and assembly add value (Gunasekaran & Sarhadi 1998). Many indirect, support costs, and other overhead costs are not used by products in proportion to the volume of their production (Cooper & Kaplan 1999) but are necessary costs for manufacturing.

Given the inherent weaknesses of not including all product costs and allocating costs using a single driver, traditional cost allocation methods do not produce accurate information (Brown, Myring & Gard 1999; Kolosowski & Chwastyk 2009) which is necessary to ascertain efficiency of the activities.

It can be argued that traditional cost methods have not evolved incrementally with the changes that have taken place in the work environment. Increasing percentages of overhead and indirect costs are being allocated to products and services using a simplistic allocation base (example: labour hours) which have little or no cause-effect relationship to the costs of hundreds of different products (Brown, Myring & Gard 1999, p. 5). The distortion of cost information can have an adverse effect on management decisions which rely on accurate product cost information: for example, make or buy decisions and pricing (p. 5).

Traditional cost approaches, it can be argued, do not create enough possible options to determine precise costs. A more complete description of "the effectiveness of realised actions [activities]" (Chwastyk & Kolosowski 2009, n.p.) is not possible within the scope of traditional approaches.

2.4 Activity-based Costing (ABC)

In Australia, traditional methods have been used to classify costs in manufacturing (Foreman 2001). In the early 1900's small manufacturing operations, as well as some larger enterprises, historically only produced a small number of products. Whether the organisation produced coal, agricultural products or clothing, the list of products were relatively small. This is in contrast to the last half of the 20th century

where some larger enterprises produce thousands of different and diverse products. This diversity is also reflected in the types of indirect costs an organisation will have.

In the 1980's a more complex system, activity-based costing, began to develop as a solution to the overhead allocation problems (Johnson & Kaplan 1987). However, the complexity of the innovation hindered its rapid and widespread adoption (Rogers 2003). ABC focuses on the 'activities' that generate the costs and not only on the financial information related to business transaction (Manalo & Valenzuela-Manalo 2010). It is argued that ABC is a more rigorous methodology of costing and cost allocation than traditional methods. It was designed to improve the accuracy of costing and identify areas for improvement in the processes (Kolosowski & Chwastyk 2009).

As described by Moore (2000, p. iv), ABC is a methodology used to measure "costs and performance of activities, resources used, and costs 'objects' such as products or services." ABC allows management to identify inefficient or avoidable activities and opportunities for cost reduction or production efficiency (Moore 2000, p. 4). The purpose is to provide more accurate cost information that is better identified to the product/services created for decision making by management. "ABC adds rigor to tracing costs of activities performed giving more accurate cost information with less distortion" (Gunasekaran & Sarhadi 1998, p. 231-232).
The primary purpose of ABC is to increase profits (Cooper & Kaplan 1999). Although profit as an objective does not specially apply to the government sector, the non-profit sector or to universities, every organisation wants to avoid the

unpleasant situation of cost blow outs on a regular basis. Therefore, almost all sectors can benefit from having more accurate cost information. "ABC can assist in increasing the accuracy of cost allocation" through the use of multiple drivers (James & Elmezughi 2010, p. 52). Through the rigor and diligence of ABC, greater accuracy in allocating overhead costs can yield better information for decision makers to operate within their means.

Some of the purposes of ABC include the following (Gunasekaran and Sarhadi 1998, p. 231):

- Decrease cost distortions of product costs
- Improved product pricing through more accurate allocations of costs
- Improved transfer pricing through more accurate allocations of costs
- Identify major cost centres
- Increased productivity
- Identify major profit centres

James & Elmezughi (2010, p. 52) argue that ABC performs the meaningful function of delivering more precision by using more 'measures of performance'. The establishment of additional activities is part of the rigor of activity-based costing. The aim of ABC is to better allocate indirect costs and overhead in a systematic rational manner through the use of a more robust methodology. The rigor of ABC can also help to identify and reduce inefficiencies and the waste of resources and with the identification of non-value added activities by eliminating or improving the overall process—efficiency (Gunasekaran & Sarhadi 1998).

There is a growing acceptance that the goal of ABC is to reduce costs by improving the accuracy of measuring the costs and adding additional performance indicators to

support improved managerial decision making (Cooper & Kaplan 1991; Gunasekaran & Sarhadi 1998). In the case of governmental organisations, improving the accuracy of costs can lead to greater efficiency in using and allocating resources. Reducing costs is important for most organisations. Having and improved understanding of the cost function (Edwards 2008; Mitchell 1996; Reich & Abraham 2006) is equally or more valuable in the not for profit and university sectors (Cropper & Drury 1996). There is growing consensus that "ABC is a method for allocating cost in a much more efficient and accurate way than that of a traditional costing system" (James & Elmezughi 2010, p. 56). It is paramount to have knowledge of the related activities that generate the costs to "ensure that appropriate cost information is provided to support decisions and actions" (Shields 1995, p. 148).

2.4.1 How ABC Works

Let me elaborate briefly on how ABC works in practice. Activity-based costing is a methodology used for allocating 'overhead' and 'indirect' costs to products and services. Broad and Crowther (2001, p. 28) explain that ABC is a system of identifying the principal 'activities' an organisation performs and then identify the overhead costs that are associated with those activities.

ABC begins with identifying and defining activities. Following Cooper's Cost Hierarchy (Juchau et al. 2009) aids in categorising the activities using unit, batch, product-sustaining and facilities-sustaining classifications (Cooper & Kaplan 1999, p. 212). *Unit-level activities* are activities that need to be performed for every unit

produced. Grinding, drilling and performing inspections are examples of product level activities. *Batch-level activities* are activities that can be traced to specific batches or production runs. Machine setups for a production run, purchasing materials and processing a customer order (p.212). *Product-sustaining activities* are necessary for the production of individual products or services. This could include customer-sustaining activities which are outside traditional normal factory activities. Examples of product-sustaining activities include "maintaining and updating product specifications, special testing and tooling for individual products and services, and technical support provided to individual products and to service individual customers" (Cooper & Kaplan 1991, p. 212). Activities to manage product or service mix and volume, brand advertising can be classified as "*brand* or *product-line sustaining"* activities since they support an entire product line or brand, (p. 212). Automobile manufacturers typically focus advertising to specific models or product lines such as light trucks, sport vehicles or specific luxury automobiles. These are examples of product-line sustaining activities. *Facility-level activities* would include plant manager, administration staff, trade-shows and general advertising, and catalogues should not be traced to individual products, services, or customers. These activities and costs cannot readily be traced to individual products and services.

The hierarchy of activity levels is a useful tool in identifying and separating activities. It is noticeable that there are some activities that can overlap to different levels of groupings, but it does not take arduous effort to separate actions or percentages of activities that can be allocated to the different hierarchy levels. A large volume of activities can often be identified when working with several

different departments. The activities can usually be grouped by activity drivers to reduce the overall number.

The next step is to develop a list of all overhead costs and to separate them into 'activity level' cost pools. The costs can be separated into unit-level costs, batch level costs, product-sustaining costs and facility level costs. Drivers can be determined to allocate support service departments costs such as maintenance, accounting, engineering and human resource costs can be allocated between other support departments before these costs are allocated to the hierarchy levels.

With the assistance of a hierarchy of unit level, batch-level, and product-sustaining level activities (Cooper & Kaplan 1991, p. 211) it is fairly easy to visualise the added accuracy that ABC can provide compared to traditional methods. Primary activities are supported by secondary activities. Human resource activities cannot be specifically 'identified' to particular units or customers. These secondary activities can be allocated to units, batches, product-level activities and facility-level activities through 'primary drivers' increasing the accuracy of the overall system (p. 210). The number of activities depends on the required level of accuracy. The higher level of accuracy needed would call for more activities. The higher number of activities would increase costs to create the system and the costs to maintain it. Cost versus benefit constraints should be

An ABC Illustration

As an example, company XYZ Ltd produces two products that it sells: standard product A and Premium product B (based on Juchau et al. 2009, p. 734-735). XYZ Ltd adequately accounts for direct costs but allocates overhead, indirect costs, based on direct labour hours. The allocation of overhead using units of production, labour hours, labour costs, or machine hours are considered traditional methods of overhead allocation. The overhead costs in this example include: product inspections, indirect materials, purchasing, and supervision and overhead is allocated based using direct labour hours.

Table 2.1: Sample Case of ABC analysis

Selected Overhead Costs:		
Purchasing Costs	$	40,000
Indirect Materials		30,000
Product Inspections		25,000
Supervision		40,000
Total Overhead	$	135,000
Divided by Direct Labour Hours		10,000
OH per DL hour	$	13.50

Table 2.2: Overhead applied using Traditional methods (Direct Labour Hours)

	Product A	Premium Product B
Unit Sales price	$ 600	$ 900
Direct Materials	150	375
DL Hours	10	10
DL Hourly Rate	18	24
Direct Labour	180	240
Overhead $13.50 * 10 hrs	135	135
Total Unit Costs	$ 465	$ 750
Gross Margin	$ 135	$ 150

Note: Premium Product B is slightly more profitable than Product A

Table 2.3: Overhead applied using ABC

Using ABC Methodology ABC Cost Drivers	900 units	100 units	1,000 units Ext.	OH Costs	**OH per Driver**
Number of purchase orders	1,500	500	2,000	$ 40,000	$ 20.00
Indirect Materials (number of units)	900	100	1,000	30,000	$ 30.00
Inspections (number of inspections)	400	600	1,000	25,000	$ 25.00
Supervision (number of inspections)	400	600	1,000	40,000	$ 40.00
				$135,000	

Table 2.4: ABC Overhead Allocations

ABC Overhead Allocations		Product A	Premium Product B	Total OH
Number of purchase orders	driver x OH/	30,000	10,000	40,000
Indirect Materials (number of units)	driver x OH/	27,000	3,000	30,000
Inspections (number of inspections)	driver x OH/	10,000	15,000	25,000
Supervision (number of inspections)	driver x OH/	16,000	24,000	40,000
		$ 83,000	$ 52,000	$ 135,000
Number of Units Produced		900	100	
ABC O/H Allocation per unit		$ 92	$ 520	

Note: Product A has much lower OH cost allocation & Premium Product B is much higher

Table 2.5: Analysis of Profit using ABC methodology

Unit Sales price	$ 600	$ 900
Direct Materials	150	375
Direct Labour	180	240
Overhead $75,000/10,000	92	520
Total Unit Costs	422	1,135
Gross Margin	**$ 178**	**$ -235**

Note: Gross margin per Product A is 32% higher when using ABC vs traditional Methods and gross margin for Premium Product B is a substanial loss per ABC

Notice that in the example above, traditional cost methods indicate a gross margin for Product A to be $ 135 and for Product B $ 150. Using ABC, the actual gross margin of Product A is $ 178 per unit which is considerably higher than the $ 135 calculated using traditional method. Notice the profit using ABC indicates a loss of $ 235 per unit of Product B. The two methodologies are using the exact same amounts of overhead costs; it is only the method of allocation that modifies the final outcomes. As you can imagine, this type of information is highly used for managers and decision makers.

This example makes it easy to see the value of ABC; however, if a company is making a million units and there is a small one dollar variance, the results of selling a product or services can be dramatic.

2.4.2 The Benefits of ABC

The main advantage of ABC is that it minimises or avoids distortions on product costs that might occur from arbitrary allocation of overhead costs (Edwards 2008).

ABC methodology helps to uncover the causal events that are part of an organisation and that may have a significant impact on the pricing of products or/and services. Organisations for example may believe that their fixed costs were increasing faster than the number of units produced. ABC can be used as an approach to 'deconstruct' overhead costs that were thought to be fixed into variable costs such as portions of "individual orders, products, services, customers, and channels" (Manalo & Valenzuela-Manalo 2010, p. 2482). Financial information alone can show a 'big-picture' view of costs of certain operations; however, financial numbers do not reveal underlying activities that create those costs. As mentioned by Melese, Blandin & O'Keefe (2004, p. 123), ABC can expose duplicated and non-value added activities because the methodology of ABC looks at the 'activities' that generate the costs.

2.4.3 Activity-based Costing vs. Traditional Methods

Traditional costing systems were designed for profit seeking organizations producing a limited number of products or services. The information was derived from readily available financial feedback generated by the monthly reporting cycle (Cooper & Kaplan 1999). In accordance with International Financial Reporting Standards (IFRS), Australian Accounting Reporting Standards (AASB), and U.S. Generally Accepted Accounting Principles (GAAP), manufacturing and related sales organisations have statutory requirements to measure and report their inventory and costs of goods sold (Cooper & Kaplan 1999, p. 455). Organisations that deliver a diversity of products or services, it can prove challenging to establish the full and separate costs for each object with acceptable accuracy. If the inaccuracies are

substantial it can lead to problems, including the dangerous error of mistakenly pricing objects below their true cost (Simmons, Wright & Jones 2006). In the case of misallocating overhead costs, the result can be the reduction of expected excess resources (the bottom line) without an adequate understanding as to why (Brown, Myring & Gard 1999; Simmons, Wright & Jones 2006). ABC is a technique designed to help overcome these challenges and to provide organizations with costing information with greater accuracy and completeness for better decision making (Maelah et al. 2011a ; Raz & Elnathan 1999; Simmons, Wright & Jones 2006).

2.4.4 ABC Applications

The potential of applying ABC is substantial. The following table is adapted from Pavlatos & Paggios (2009, p. 516). It gives a visual representation of many of the possible applications for ABC [see Table 1].

Kennedy and Affleck-Graves (2001, p.22) mention “Even though the ABC concept was initially developed in a manufacturing context, it can be applied equally well in the services sector, as activities are universal to all organizations”. Other industries and applications that use ABC include: hospitality and tourism (Appah, E & Binaebi, B 2013; Ferreira, Moulang & Hendro 2010; Guilding, Kennedy & McManus 2001; Pavlatos & Paggios 2009; Pellinen, J 2003), the insurance industry (Delpachitra, S 2008), customer profitability (Cokins 2015), transport and construction (Ferreira, Moulang & Hendro 2010), supply chain management (Anderson & Dekker 2009; Roodhooft & Konings 1997), hospitals (Appah &

Binaebi 2013; Pizzini 2006), public sector (Arnaboldi & Lapsley 2003; Baird 2007; Brown, Myring & Gard 1999) financial services (Hussain & Gunasekaran 2001; Innes, J, Mitchell, F & Sinclair, D 2000; Ooi & Soh 2003) and many more.

Period expenses, costs, units, etc. are historical components of primary applications of ABC used to identify costs for decision making. Acquiring more accurate measurements of prior period and current costs are necessary for making current decisions. Historical components are existing data from prior or current financial accounting data such as costs and period expenses. Period expenses are typically costs that occur during the financial periods such as cost of materials, cost of

TABLE 2.6: Applications for Activity-based Costing

Better understanding of costs	Cropper & Drury 1996; Mitchell 1996; Brown, Myring & Gard 1999;Cropper & Cook 2000; Cohen, Venieris & Kaimenaki 2005; Reich & Abraham 2006; Simmons, Wright & Jones 2006; Edwards 2008
Budgeting	Cooper & Kaplan 1999; Cokins 2008; Manalo & Valenzuela-Manalo 2010b
Costing projects	Raz & Elnathan 1999
Cost modelling	Cooper & Kaplan 1991; Innes & Mitchell, 1995; Innes, Mitchell & Sinclair 2000
Cost reduction	Cooper & Kaplan, 1991; Innes & Mitchell, 1995; Innes, Mitchel & Sinclair 2000
Customer profitability analysis	Innes & Mitchell, 1995;Innes Mitchel & Sinclair , 2000; Guilding, Kennedy & McManus 2001; Guilding & McManus 2002; Cokins 2015
Customer Service	Cooper & Kaplan 1991; Innes & Mitchell, 1995; Innes, Mitchell & Sinclair 2000; Guilding, Kennedy & McManus 2001;Guilding & McManus 2002; Cokins 2015
Linkage of cost management system to performance evaluation and compensation	Shields 1995
Make or buy decisions	Brown, Myring & Gard 1999
Output decisions	Innes & Mitchell, 1995; Cooper & Kaplan 1999; Innes, Mitchell & Sinclair 2000
Outsourcing decisions	Brown, Myring & Gard 1999

Performance measurement	Innes & Mitchell, 1995; Innes, Mitchell & Sinclair 2000
Product & service pricing	Innes & Mitchell, 1995;Clarke, Hill, & Stevens 1999; Innes, Mitchell & Sinclair 2000
Product or service-mix decisions	Cooper & Kaplan 1999; Cagwin & Bouwman 2002
Supply chain management	Askarany, Yazdifar & Askary 2010
Target Costing	Cooper & Kaplan 1999

labour, costs of work spaces, utilities, insurance, administration costs, etc. usually in monetary terms: dollar costs. Data from operations would include items that are not captured or recorded in financial (accounting) data such as the number of inspections, labour hours, allocation of labour hours, quantity of work space area, number of units produced, etc. Many of the operational items can be the actual drivers or reasons for creating the dollar costs. A more proactive use of ABC can provide management with information where decisions can be made that will affect future period costs verses using only to assign historical costs (Cooper & Kaplan 1999, p. 249). Forecasting and predictive planning is the next natural step for ABC (Cokins 1999, p. 38).

2.4.5 ABC Limitations

Let me highlight some of the perceived limitations of ABC in comparison to other methods – particularly the traditional cost systems. It has been argued that the simplicity of the traditional cost systems is a significant factor in not adopting other innovative cost systems (Brown, Myring & Gard 1999). Organisations are also constrained by the cost to acquire the information compared to the decision usefulness of the data—cost vs. benefit. The more that accurate information is needed, the more complex an activity-based costing system needs to be. More

complex systems often increase the costs of implementation and periodic updating (maintenance). However, according to Anderson, Hestford and Young (2002), high degrees of complexity do not require a significant increase in time.

ABC implementations are not for the faint of heart (Brown, Myring & Gard 1099, p. 19). ABC often takes a considerable amount of time to implement and often require multiple iterations to produce require information (Anderson 1995). ABC requires knowledgeable and well-trained staff to implement and maintain which is one of reasons that outside consultants are often necessary for successful implementations (Brown, Myring & Gard 1999). Outside consultants tend to produce more complex systems adding to costs and complexity (Anderson, Hestford & Young 2002).

As per Rogers (2003) there are five attributes of innovation: relative advantage, compatibility, complexity, trialability and observability. Relative advantage is the advantage perceived by adopters. Complexity is the perceived understanding of the innovation. The innovation needs to be relatively easy to understand and implement. Trialability relates to initiating the innovations on a trial basis. A 'trialable' innovation reduces uncertainty to a potential adopter gives them an opportunity to experiment. The final attribute is observability: the ability to observe the degree in which the results are observable and visible. ABC does not have all of the attributes necessary for widespread rapid diffusion. It lacks compatibility with existing accounting systems, it has significant complexity, and the results are not readily or immediately observable by untrained management.

Some of the most common reasons for not adopting ABC highlighted in the accounting literature are listed below: (Innes, Mitchell & Sinclair 2000; Innes & Mitchell, 1995; Pavlatos & Paggios 2009, 517)

- satisfaction with the existing cost accounting system (Brown, Myring & Gard 1999; Pavlatos & Paggios 2009),
- lack of top management support (Kaplan 1986; Shields 1995),
- linkage to competitive strategy (Shields 1995),
- high perceived cost of initial ABC implementation (Simmons, Wright & Jones 2006),
- lack of adequate training about ABC implementation (Shields 1995),
- different degrees of resistance to innovation (Bjornenak 1997) ,
- lack of time to access ABC suitability to their company, and the
- lack of appropriateness to the respondent's type of business (Broad & Crowther 2001).

2.5 ABC Adoption and Implementation

ABC adoption is a highly individualized process due to key elements: organisational strategy and structure; competitive markets; management support; organisation size; product/service diversity; ratio of indirect to total costs (Gosselin 1997). Gosselin's (1997, p. 105) ABC paradox: "if ABC has demonstrated benefits, why are more firms not actually employing it?" Not all innovations get rapidly adopted, even the very good ones. If they are adopted, it may require a longer time to become well-established (Rogers 2003; Sevcik 2004). The degree of implementation is also relevant as is the complexity of the innovation. ABC does not have a 'plug and play' option which has probably been a significant detractor from widespread implementation.

Kaplan (1986) observed four possible explanations for management accounting's lag behind the pace of change: the lack of adequate role models, the prevalence of computer-based accounting systems, the emphasis on financial accounting and the fact that top management does not emphasize the improvement of the relevance of their management accounting systems." Krumwiede (1998) states that user satisfaction with ABC depends on the stage of implementation (Krumwiede's 9 stages are listed below). Adopters within the early stages have much of the costs and initial time involvement without the full range of benefits. Whereas 'mature' adopters, where ABC is part of their routine and well integrated into their primary financial system, consider the use of ABC as "successful compared with traditional cost management systems" (Byrne, Stower & Torry 2007).

The following table include Kip Krumwiede's (1998) nine stages of ABC implementation compared with Randolph Cooper and Robert Zmud's (1990) six stages of IT implementation.

Table 2.7: Stages of Implementation

Krumwiede (1998) (ABC implementation)	**Cooper (Randolph) & Zmud (1990)** (IT implementation)
1. Not considering ABC	Initiation
2. Considering ABC	
3. Considered then rejected	
4. Approved for implementation	Adoption
5. Analysis	Adaptation
6. Getting Acceptance	
7. Implemented then abandoned	Acceptance
8. Used somewhat	Routinisation
9. Used extensively	Infusion

Adapted from Krumwiede (1998, pp. 242-3 & 270; Cooper & Zmud 1990, p. 124). Note: Some of the stages do no directly correlate with each other.

Per Byrnes, Stower & Torry (2007, p. 5), Anderson and Young (1999) expounded on Cooper & Zmud's (1990) six stages of implementation and focused them on the implementation of ABC as follows:

- initiation – feasibility analysis is done
- adoption – decision to invest some level of resources is made
- adaptation – analysis is made of firm's activities and cost drivers, ABC information is avail-able but not yet used by non-accounting staff for decision-making
- acceptance – occasionally used by upper management for decision-making, but still considered a project or model
- routinization – commonly used by upper management for decision-making and considered a normal part of the information system
- infusion/integration – used extensively and fully integrated within the primary financial system

The stages of implementation are important to this research. In order to determine if ABC has been in fact adopted, this research aims to determine at the level of implementation in Australian Universities. It is an objective of this research to determine if Australian universities have fully implemented and using ABC or if they are merely "somewhat using" it (Krumwiede 1998).

2.6 Service Organisations and Universities

Until 1996 most of the studies of ABC were related to the manufacturing sector and to a modest extent related to the service sector (Cropper & Drury 1996). This is a logical assertion since ABC was originally specifically designed for the manufacturing sector. Cooper and Kaplan (1988; 1991) did include case studies related to the service sector as well as the manufacturing sector in their books.

Although service industries have existed for hundreds of years, only in recent decades has the need for accurate costing substantially increased (Raz & Elnathan 1999; Maelah et al. 2011b). Service organisations have not had the statutory requirements to report cost of products and inventory that are necessary in the manufacturing industry (Cooper & Kaplan 1999, p. 455).

In order to determine if there are opportunities to pursuing more advanced cost accounting methods or whether the efforts are worth pursuing, service firm managers need to have an adequate understanding of the benefits and disadvantages of advanced costing activities and the full costs and benefits of the activities. "Even though the ABC concept was initially developed in a manufacturing context, it can be applied equally well in the services sector, as activities are universal to all organizations" (Kennedy & Affleck-Graves 2001, p. 22). Cooper and Kaplan (1999, p. 454) add that the structure of the ABC model is equally adaptable to service industries.

Some researchers have argued that Universities worldwide should consider some very important questions (Lutilsky & Dragija 2012, p. 34).

- Are the services provided aimed toward the users? [i.e. students]
- Are the resources used in the best manner to give the best value for money?
- Is their management successful and directed towards their stated objectives?

If used correctly, ABC can provide valuable information for university managers to decide which programs should or could be expanded and which programs should be minimised or eliminated. However, ABC can "prove to be a time-consuming

process" resulting in information that is "minimally useful" or information that can lead to possibly inappropriate decision making if applied incorrectly (Broad & Crowther 2001; Simmons, Wright & Jones 2006; Toompuu & Polajeva 2014). The latter being the result of most decisions if inadequate or incorrect information is being used regardless of what methods were being employed.

Governmental, not-for-profit organisations and universities are facing some of the same basic collection of challenges (Melese, Blandin & O'Keefe 2004, p. 103):

- improve effectiveness - (emphasizing outputs over inputs);
- improve efficiency - (managing costs); and
- improve accountability - (tying budgets to performance).

More useful accurate costing of university programs is vital for administrators and managers in the present environment (Ismail 2010; Kont 2011; Lewis & Stiles 2004; Lutilsky & Dragija 2012; Moll & Hoque 2011; Ratnatunga & Waldmann 2010). With increased competition for domestic and international students and advanced research coupled with proposed decreases in government funding, universities often search for addition revenues to cover present financial demands by developing specialized programs (such as MBA programs), or continuing education (Simmons, Wright & Jones 2006, p. 29). Unfortunately, decisions are likely to be made without a well-defined understanding of the incremental and total costs compared to the potential increase in gross revenues and net financial contribution to the organisation.

With more Australian universities offering similar academic programs there is increased competition between universities to capture a larger market share or retain their present market share of domestic and international students and research funding. Some universities have been able to successfully offer different online study programs, job placement services for current and former students, part-time MBA programs or specialised MBA's (Simmons, Wright & Jones 2006, p. 29): product differentiation strategy (Porter 2008).

When the traditional cost accounting systems were being developed, overhead and indirect costs were only a small percentage of total costs; direct materials and labour were the most significant product or service costs (Brown, Myring & Gard 1999; Ismail 2010; Kont 2011; Lewis & Stiles 2004; Lutilsky & Dragija 2012; Moll & Hoque 2011; Ratnatunga & Waldmann 2010). As organisations began to provide varied products and services, overhead cost increased significantly. Overhead rates were reaching 50-60% of total costs and could reach 500-1,000% of direct labour cost (Cooper & Kaplan 1999, p. 3; Manalo & Valenzuela-Manalo 2010, p. 2481). Per Lutilsky and Dragija (2012, p. 34), the authors reasoned that in universities "all costs are indirect," hence the need for more accurate cost allocations are essential.

On the other hand, Broad and Crowther (2001) argued that the decentralisation of university management, the university culture, and the degree of financial control systems, are all important factors. Broad and Crowther supported that existing cost systems as being adequately effective for decision making and deemed ABC to be inappropriate because of problems with ABC in the university environment (p. 56).

Problems acknowledged by Broad and Crowther include the difficulty in identifying cost drivers in universities environments, time and cost and lack of knowledge (p. 61).

Because of the "shift in processes" partially brought on by a higher degree of technology and a decrease in labour costs, indirect or overhead costs have attained a much higher proportion of total costs. Because of this shift, the allocation of these costs to products and services has captured the consideration of scholars and practicing professionals (Brown, Myring & Gard 1999; Maelah et al. 2011a).

Complex organisations would likely have much higher indirect and support costs (overhead) because of their more diverse product mix and complex processes (Cooper & Kaplan 1999, p. 209). The traditional methods of costing have become progressively more inaccurate" as the proportion of indirect costs have risen (Edwards 2008). Significant overhead costs allocated to products or services using a single allocation base for which the cause and effect relationship is no longer as valid has led to distorted product/service costs and poor decision making (Cooper & Kaplan 1999; Johnson & Kaplan 1987; Kaplan 1986;).

Universities have also discovered and increase in administrative and support costs are accompanied by a larger number of educational product lines. A number of factors have caused university administrators to analyse costs with a greater focus. Typically, government grants may not have kept pace with the increasing costs of university programs (Simmons, Wright & Jones 2006).

A growing concern is that universities do not function as efficiently as business organisations. Universities "tend to acquire 'property rights' for new programs. Once these programs are opened, they do not tend "the kind of continuous pruning of activities that characterize for-profit entities" (Mensah & Werner, 2003, p. 298). With the increased cost of operating universities and pending decreased government funding in Australia, a distinct and accurate understanding of the costs of these programs is necessary for determining which programs are generating adequate demand for their services (Cohen, Venieris & Kaimenaki 2005; Cropper & Drury 1996; Simmons, Wright & Jones 2006).

Application of ABC in universities globally has received limited attention. See Table 2 for a list of ABC studies in universities by year. As is evident, a few studies of ABC being used in universities began in the late 1990's and more studies began to proliferate after the turn of this century. The list is not meant to be fully comprehensive list of studies, but to give an idea as to the research that has been performed.

TABLE 2.8: List of research of ABC related to universities by year

	Researchers	Method	Topic	Country
1996	Mitchell, M	Survey	ABC Usage	UK
1996	Cropper, P & Drury, C	Survey	ABC Usage	UK
1998	Ellis-Newman, J & Robinson, P	Case Study	Library	Australia
1998	Goddard & Ooi	Case Study	Library	UK
2000	Cropper & Roger Cook	Survey	ABC Usage	UK
2001	Henderson, T & Brown	Case Study	Course Costing	USA
2001	Broad, M & Crowther, D	Survey	Appropriateness	UK
2003	Ellis-Newman, J	Case Study	Library	Australia
2003	Whelan, V	Case Study	Implementation	Australia

2004	Lapsley, I & Miller, P	Literature Review	General ABC in Universities	UK
2004	Lewis, B & Stiles, D	Survey & Case Studies	Cross-Subsidization	UK
2006	Reich, F & Abraham, A	Case Study	Staff Data Collection	Australia
2006	Simmons, C, Wright, M & Jones, V	Hypothetical Case Study	Benefits & Caveats	Canada
2007	Sae'b Jarrar, N, Smith, M & Dolley, C	Survey	Implementation	Australia
2007	Pernot, E, Roodhooft, F & Van den Abbeele, A	Case Study	Time-Driven ABC	Belgium
2010	Ismail, NA	Case Study	Implementation	Malaysia
2010	Ratnatunga, J & Waldmann, E	Case Study	Research Cost Allocations	Australia
2011	Kont, K	Literature Review	Library	Estonia
2011	Maelah, R, Amir A, Ahmad, A & Auzair S 2011a	Case Study	Cost per Student	Malaysia
2011	Maelah, R, Amir A, Ahmad, A & Auzair S 2011b	Case Study	Pricing	Malaysia
2012	Lutilsky, I & Dragija	Case Study	Potential Imple-mentation	Croatia
2014	Toompuu, K & Põlajeva, T	Survey	Cost Drivers	Worldwide

As per Mitchell (1996, p. 56) perhaps the most important results from the research was the focus on the value or worth of ABC methods. ABC was principally used to allocate central services to academic departments which brought more perceived impartiality to the allocations to the process. The allocation of overhead is one of the primary purposes of ABC (Cooper & Kaplan 1988; 1991). About 20 percent of the respondents indicated they were “overwhelmingly positive about its benefits, in particular its value in improving cost-awareness in the organization (Mitchell 1996, p. 51). ABC’s improvement in understanding and cost awareness is a theme throughout the literature (Cohen, Venieris & Kaimenaki 2005; Cropper & Cook 2000; Cropper & Drury 1996; Edwards 2008; Ellis-Newman & Robinson 1998; Henderson & Brown 2001; Ismail 2010; Maelah et al. 2011b; Simmons, Wright &

Jones 2006; Velmurugan 2010; Whelan 2003). Brown, Myring & Gard (1999, p. 7-8) state that the "better than usual understanding of why overhead costs are incurred" is a valuable "side benefit" for attempting to install an ABC system. This implies the principal benefit is to know the true costs for improved decision making.

Cropper and Drury's (1996) research of costing was one of the early studies focusing on university costing methods. Cropper and Drury note that a shared complaint in universities was their hesitancy to adopt commercial methods and allocate realistic overhead rates based on actual usage of overhead services. Twenty-seven percent of their respondents stated that they believed ABC provided the most appropriate methodology to ascertain their costs. The findings in their research indicated that universities desired to move towards a more accurate basis for their costing of their principal activities (Cropper & Drury 1996).

> "It may well be that institutions have good reason for accepting contracts at below full cost. For example, the research may be of a wide-ranging and intrinsic nature leading to publications. But institutions should at least be aware of the costs involved in order to make informed decisions" (Cropper & Drury 1996, n.p.).

Cropper and Cook's (2000) follow-up study was to determine if universities had made any significant progress in implementing ABC since the 1996 Cropper and Drury research. As mentioned earlier, their most significant finding was that over 83% of institutions were currently dissatisfied with their costing systems and were searching for alternatives. This is much higher than the finding in the 1996 study where only 17 percent of the universities were searching for alternative cost systems (Cropper & Cook 2000, p. 64). The comparison of the findings provides "compelling evidence" towards an expanded discussion of ABC within the

university sector. The typical explanations for higher education institutions rejecting ABC were the standard theories found in the literature: time constraints combined with lack of appropriate staff (38%) and lack of upper management support (22%) (Cropper & Cook 2000, p. 65).

In late 1990's the decrease in government financial support and university budget cuts had forced many universities to focus on expenditure relationships and attempt to make operational areas more efficient (Ellis-Newman & Robinson 19983). Similar to the private sector, university libraries produce multiple products and services. In order to improve their efficiency, libraries should be aware of private sector innovations and be prepared to implement relevant methods for analysing costs and allocating resources. ABC is ideally suited for use in academic libraries because library activities are activities are distinct and separable (Ellis-Newman & Robinson 1998, p. 374). The most significant outflow is salaries which can be readily traced to activities based on the "amount of time each staff member spends on each activity" (Ellis-Newman & Robinson 1998, p. 374). ABC can assist management gain a better understanding of the cost of each activity where traditional cost systems fail (Cohen, Venieris & Kaimenaki 2005; Edwards 2008; Gunasekaran et al. 2005; Simmons, Wright & Jones 2006).

A model of ABC surfaces from the analysis of activities which is less subjective than the methodology of traditional systems (Goddard & Ooi 1998). Goddard and Ooi state that the potential university application of ABC can improve overhead allocations that reflect a more appropriate charge of central university services: the

allocation is based on the direct usage of services. The authors found that ABC allocations to be more accurate and creditable when compared to traditional methods. They also mentioned the impracticality of developing ABC overhead allocations for all of the university's central overhead (p. 32). Goddard and Ooi's case study also focused on library services but stated the methodology was valid for other central services. The ABC methodology can result in significant differences in the allocation of overhead when compared to traditional allocations (Goddard & Ooi 1998).

Henderson and Brown (2001) said that most of the applications of ABC in education at that time were occurring in the English-speaking world: Australia, Canada, Great Britain, Honk Kong and the U.S. (p. 211). This is certainly not the case as of 2019 where several research projects have been conducted worldwide since 2000. These include Spathis & Ananiadis (2004), Aristotle's University of Thessaloniki, Greece; Pernot, Roodhooft, & Van den Abbeele (2007) of Katholieke Universiteit Leuven, Belgium; Ismail (2010) of Universiti Utara Malaysia, Malaysia; Kont, K (2011) of Tallinn University of Technology Library, Estonia; Maelah, Amir, Ahmad & Auzair (2011a) of Universiti Kebangsaan Malaysia and Lutilsky & Dragija (2012) of University of Zagreb, Croatia). An interesting observation of several of these studies was the choice of university departments: libraries. As per Ellis-Newman and Robinson's (1998, p. 374) assertion, "ABC is ideally suited for use in academic libraries. Many activities are discrete, and the major expenditure, salaries, can be easily traced according to the amount of time each staff member spends on each activity."

Not everyone agrees that ABC should be used in universities. Although some universities expressed that they were using ABC, they were actually using a "hybrid somewhere in between traditional absorption costing and activity based costing" (Broad & Crowther 2001, p. 66). Broad and Crowther were fully aware of the benefits and challenges of ABC. They question why universities prefer to cost schools rather than courses whereas manufacturers use ABC to cost product at the unit level. In this context they argue that ABC is inappropriate to provide information to decision making in the university environment. Ratnatunga and Waldmann (2010) agree that ABC and Time-Driven ABC (TDABC) are not accurate enough to provide information on teaching and research departments. Broad and Crowther (2001) state that the costs of staff represent the highest percentage of individual school costs and these costs are not easily identifiable to specific courses or research. They further state that administration costs are principally fixed costs. Universities argue that it is not practical and too complicated to cost courses. Per Broad and Crowther (2001), this is a weak argument. Universities are subject to the same business pressures as commercial organisations and may eventually have to make the same type of difficult decisions. Ratnatunga & Waldmann (2010, p. 201) state that while ABC has a technical predominance over traditional methods, ABC has not been successful in widespread supplanting traditional models.

Ellis-Newman's (2003) research, a case study at Edith Cowan University library, is a follow-up study ECU's Churchlands campus in 2001. This was the same campus that was studied earlier (Ellis-Newman & Robinson 1998). Since the first study was conducted the library had undergone extensive automation with new computers and

software. The ABC system utilised just fewer than 20 drivers for the identified activities (Ellis-Newman 2003). The financial reports required by funding bodies did not contain adequate information on the individual costs of services for managerial decision making. Although librarians are not trained as accountants, they need accounting information for strategic planning and operational control. ABC's use of multiple drivers and cost pools allowed more detailed and accurate costing of the services provided than through their tradition methods. With this added detail managers can decide if specific activities are necessary, whether they can be eliminated or whether they can be more efficiently utilized.

The Ellis-Newman (2003) paper, as well as the Ellis-Newman and Robinson (1998), is a significant study showing how ABC can be effectively used in the university setting. This contrasts with other research that suggests ABC is not appropriate for university use in an earlier study (Broad & Crowther 2001, p. 66) and Ratnatunga and Waldmann (2010), a later study.

One of the notable outcomes from Whelan (2003, p. 7) was the ABC methodology determination that teaching required only 6 percent of the overall activities in a university department. This contrasts with the common widely held view that the primary purpose of universities is the education of students (Star & Hammer 2008). A current benefit mentioned by Whelan through the development of an ABC system has been the ability to confidently make alterations in their teaching plan and the ability set break-even points based on minimum enrolment numbers. The author stressed the 'perceived confidence' with the levels of management in their

department (Whelan 2003, p. 11). ABC offered them a greater understanding of process and clarification of tasks by illuminating areas of duplication, inefficiency and initiate policy changes. They also gained an increased awareness of the contribution of programs that were important to "ongoing commercial viability" (Whelan 2003, p. 11).

Historically financial performance of universities has been measured by comparing actual results to budgets (Ismail 2010). Using this traditional practice has unintentionally allowed management to make decisions without having an accurate understanding of the underlying costs of the services provided. According to Ismail, ABC can provide universities with information to ascertain the cost of resources for the services provided. His case study compares the traditional budget information and the information provided through ABC analysis. The rigor [thoroughness, objectivity] of ABC universities can better assess the resources utilised by the activities in their cost centres rather than through comparing budget to actual results which has been traditional used (p. 42). Ismail agrees with Cooper and Kaplan's (1999) three primary functions of a costing system. Other than (1) statutory reporting requirements, Ismail states that ABC is one of the only tools that is currently able to provide (2) understanding the costs of activities, products and customers and to (3) provide economic feedback to employees and operators about process efficiency.

More useful accurate costing of university programs is vital for administrators and managers in the present environment (Ismail 2010; Kont 2011; Lewis & Stiles 2004;

Lutilsky & Dragija 2012; Moll & Hoque 2011; Ratnatunga & Waldmann 2010). Increased competition for domestic and international students and advanced research grants coupled with proposed decreases in government funding, universities often search for addition revenues to cover present financial demands (Simmons, Wright & Jones 2006). Research indicates that decisions are likely to be made without a well-defined understanding of the incremental costs compared to the potential increase in gross revenues and net financial contribution to the organisation (Broad & Crowther 2001; Goebel, Marshall & Locander 1998; Simmons, Wright & Jones 2006).

2.7 The Importance of Universities to Australia

Universities are important to the prosperity of Australia through the building of human and social capital by way of their teaching and learning activities and having direct contact with students who will be the future leaders of Australia (Deloitte 2015). Technological progress and economic growth are powered by research to discover new technologies which lead to the adoption of new ideas and new practices in both private and public organisations. Universities are the leaders in the development of and educated and more productive workforce as employees and as future business owners. According to Deloitte's 2015 study (p. ix), the top five industries that are anticipated to need increased number of skilled graduates over the next ten years are:

1. education and training;
2. health care and social assistance;
3. professional, scientific and technical services; and
4. financial and insurance services.

Combined, these industries will require an additional 500,000 new university qualifications over the next 10 years (2015-2010) which will denote a expanded requirement for university qualifications of approximately 30% (Deloitte 2015, p. 46). The first level of return through investments in human capital will result in higher earnings for the individuals and at the second level, investments in human capital will generate gains which will result in higher regional and national growth rates (Gunasekar 2004, p. 330). Thirdly, organisations will be able to have the advantage of recruiting a higher qualified workforce (Wirihana et al. 2017, p. 207). In the formation of human capital, universities will need to implement courses to address the regional skill shortages in areas such as agriculture and forestry. These would include new and expanded educational programs in viticulture and wine making in Australia's growing wine industry (Gunaskar 2004, p. 337).

It is suggested that many of the regional non-metropolitan youths lack the requirements for the future skilled workforce. Regional universities have both the duty and opportunity to fulfil the demand to educate regional youths to become part of the growing skilled workforce since many to not have the financial means to attend universities in the larger metropolitan areas (Wirihana et al. 2017). Regional universities often have direct access to unique industries including agriculture, forestry, viticulture, and mining areas. Regional universities contribute to the education of future professions by serving as "enablers" in regional economic development (Gunasekar 2004) and offer opportunities in areas such as nursing programs to students who may not have been able to attend metropolitan universities (Playford et al, 2010 as cited in Wirihana et al., 2017).

Universities are essential to maintaining Australia's economic growth and continued international competitiveness because they drive technological progress and economic growth through knowledge discovery from research (Deloitte 2015). University research contributes to the adoption of new technologies and prompts spin-off companies as a by-product of the new discoveries or for the use of other organisations. Deloitte Access Economics explains the indirect use by other organisations as 'spill-over benefits' (Deloitte 2015, p.19). In developing Asia as the middle class continues to grow, the demand for education will likely increase rapidly (Deloitte 2015). As mentioned earlier, international education will be among the top five fasting growing sectors in global economy along with health care and social assistance; professional, scientific and technical services (Deloitte 2015, p. ix).

With the growth of the aging population in first world countries, including Australia, organisations will need to replace retiring workers with highly trained and knowledgeable workers to fill the need for growth in new global knowledge economies. Like many other first world countries, Australia has a significant role to play in transforming into a knowledge-based economy by developing a knowledgeable workforce and entrepreneurs who are capable of building economic value through the use of knowledge.

Research and innovation are central to Australia's overall prosperity with pervasive benefits:

- how people are educated,
- how technology is utilised,
- how good health and environmental protection is promoted,

- job opportunities and
- increasing wages, particularly for the next generation (Westacott 2013, p. 4).

According to OECD, more than half of the growth in productivity in developed countries comes from 'innovation' (Westacott 2013). Innovation and diffusion of improved production methods, and new goods and services are the 'core drivers' of productivity growth (Inquiry Report No. 84). Innovation is about creating knowledge, and diffusion is about the communication and dissemination of that knowledge i.e. using common sense "to convert the knowledge into better economic outcomes" (Westacott 2013, p. 7).

2.8 Institutional Theory and ABC

This section will explore the relationship between the Institutional Theory and ABC as a theoretical plank for this project. 'Institutional Theory' was chosen because of its wide use in management accounting research (Arnaboldi & Lapsely 2003; Covaleski, Dirsmith & Samuel 1996; Hoque & Alam 1999). We commence with a review of the term 'institution' as used in institutional theory. This is followed with a discussion of the uses of institutional theory in general and; finally, a discussion on the uses of institutional theory in university management accounting.

2.9 What are institutions?

Institutions are "…social processes, obligations, or actualities that come to take on a rule-like status in social thought or action" (Meyers & Rowan 1977, p. 341). As in institutional economics ideas and procedures can become institutionalised as well as being institutions (Hoque & Alam 1999, p. 200). Burns and Scapens (2000) mention

that although there is no universal definition of an 'institution', institutions are the embedded embodiment of customs and habits of a group. Institutions can be regarded as the "settled habits of thought and action" (Burns & Scapens (2000, p. 6). A person or object can be considered an institution: any familiar, long-established person; Her Majesty Queen Elizabeth II; a thing, a common practice or fixture can be regarded as 'institutions'. Various practices or procedures are institutions which include religious practices and rituals, myths and ceremonies (Meyers & Rowan 1977).

As per Hoque and Alam (1999), "ideas and procedures," such as accounting techniques can become institutionalised. This would open the door to many approaches in both financial and management accounting methods to be considered either stand-alone or collectively as institutions. These approaches include Just-in-time (JIT) manufacturing or Toyota Production Systems (TPA); Total Quality Management (TQM); Activity-based Costing (ABC); and others have been utilised and modified since the 1980's. JIT and TQM have been broadly accepted and institutionalised (De Zoysa & Kanthi Herath 2007; Fullerton, Kennedy & Widener 2013; Gunasekaran & Sarhadi 1998; Hopper, Otley & Scapens 2001; Hoque 2000; Jones & Dugdale 2002). Management accounting methods that have been used in organisations and taught for several decades in our universities include variable costing, contribution margin analysis, capital budgeting, product costing, trend analysis/forecasting, etc. As per Meyers and Rowan (1977, p. 345), institutions are the undeveloped organisational "building blocks" of society which can be reorganised into useful structures. If the building blocks are considered to be

"proper, adequate, rational and necessary, organisations" should logically integrate the building blocks into their organisations to support their legitimacy. ABC has been used in universities to collect cost information that could not readily be captured using traditional methods (Alabbadi & Areiqat 2010; Arnaboldi & Azzone 2004; Cropper & Cook 2000; Ellis-Newman 2003; Ellis-Newman & Robinson 1998; Goddard & Ooi 1998; Ismail 2010).

In summary, 'institutions' in the context of institutional theory are not necessarily organizations. A specific hospital would be an organization within the institution of hospital health care. In institutional theory, the hospital is not a single hospital; it is the institution of the hospitals as a whole. A university, as an institution, is not a specific university, but it could be any space for advanced education and learning. Professions and the procedural expectations of those professions can be institutions. The professions of education, law, accounting and medicine are institutions as are some of their methods and practices. Court room and teaching techniques have been passed down for hundreds of years. Philip Selznick (1957) as cited by Scott (1992, p. 66) includes in the definition of an institution being, "a more natural product of social needs and pressures—a responsive, adaptive organism.

2.10 Institutional Theory

Some versions of institutional theory are well defined and specific, but other definitions are not as well defined. In all of the definitions, there is a fundamental likeness in methods and tactics although there may be "little agreement on specifics" (Scott 1987, p. 493). Institution theory asserts that organisational structures are

often more persuasively influenced by their environments as opposed to outside market pressures (DiMaggio & Powell 1983, p. 147). Scott (1987) contends there are two primary types of actors that shape modern institutions: the state and professional bodies. These two factors influence the actions of actors and the institutional "patterns and mechanisms." DiMaggio and Powell (1983) describe coercive isomorphism arise from the political influences of the government and regulative bodies which mandate environmental regulations, discrimination practices and tax law requirements. Indirect coercive influences can come from local communities as well as other organisations. Normative pressures from professional bodies influence change in organisations (DiMaggio & Powell 1987). Requirements and expectations of professional bodies influence the actions and policies utilised in organisations and there are normally multiple kinds of professionals within a single organisation. The educational and training requirements to be members of professional organisations influence both the professional bodies and the organisations that employ them (DiMaggio & Powell 1987). Institutional theory not only recognises the constancy of "rule-based" behaviours, but it also recognises that these rules and behaviours can change (Burns & Scapens 2000).

As per Meyer (1977, p. 56) traditional allocation theory "…tends to be assumed that education has no effect on the distribution of political, economic, and social positions in society" whereas institutional theory, is a "…legitimation theory-which treats education as both constructing or altering roles in society and authoritatively allocating personnel to these roles." Individuals, actors, are expected to act in certain ways. University graduates are expected to represent themselves in certain

ways and to be treated by others differently than non-university graduates. Through these behavioural differences, "…new competencies and authorities are created" (Meyer 1977, p. 56).

Rational systems are designed within organisations for the efficient and effective realisation of achieving and completing goals and tasks (Scott 1987, p. 48). In professions there are bodies of knowledge, as in policies and programs, are accepted and understood as rational. This allows organisations to adopt new policies and procedures and incorporate them into their operational systems (Meyer & Rowan 1977). The outside influences of professions and professional organisations influence operations via normative isomorphism (DiMaggio & Powell 1983). These normative pressures, and known ways of accomplishing tasks, influence professional procedures which affect how things are done in the workplace (DiMaggio & Powell 1983). Sometimes these established procedures and techniques are not necessarily the best methods to improve efficacy (DiMaggio & Powell 1983; Meyer & Rowan 1977; Soin, Seal & Cullen 2002). DiMaggio and Powell add that the structural changes in organisations are motivated less by achieving efficacy or competition, but by the appearance of organisations to be more similar to other organisations--mimetic isomorphism. Mimetic processes in organisations are changes to model themselves to adopt process from other organisations. Mimetic actions are not necessary executed deliberately, but may be "…diffused unintentionally, indirectly through employee transfer or turnover" from similar organisations (DiMaggio & Powell 1983, p. 151). In instances like employee turnover, it may be difficult to distinguish mimetic from normative isomorphism.

2.11 Accounting Research and Institutional Theory

Through the view of institutional theory, among others, Covaleski, Dirsmith and Samuel (1996, p. 1) investigated "sociological perspectives which have provided meaningful contributions to our understanding of managerial accounting" within institutional theory. Covaleski, Dirsmith and Samuel used "Selznik's (1957, p.17) definition '…to institutionalize is to infuse with value beyond the technical requirements of the task at hand." The common contention of the institutional perspective is that the survival of an organization requires it to "conform to social norms of acceptable behavior as much as to achieve levels of production efficiency" (Covaleski, Dirsmith & Samuel 1996, p. 10). Activity-based costing would be a specifically acceptable contemporary management accounting techniques to provide achieve the goals of extracting information in which to make better decisions and improve efficiency.

Hoque and Alam (1999, p. 199) in their case study of a New Zealand construction company's adoption of Total Quality Management (TQM) and changes in management accounting systems (MAS), suggested that companies may imitate practices like TQM to promote "institutional and quality" environment "rather than for purely technical reasons." They performed their research using institutional theory where institutional theory "…implies that once these reports are prepared, for whatever reasons, organisational members may want to consider their relevance in the context of operational activity management" (Hoque & Alam 1999, p. 201).

Hogue and Alam (1999, p. 201) utilised institutional theory to help capture external "institutional" factors such as competition, customer needs, "professional associations, public perceptions, regulatory factors (e.g. legislation, guidelines, quality standards, etc.)" which influenced the adoption of TQM and the change in the management accounting system.

Other researchers that utilised institutional theory in the realm of management accounting and related topics include: Arnaboldi and Lapsely (2003) who examined the implementation of activity based costing (ABC) in local a local government in Scotland; Brignall and Modell (2000) new public sector performance measurement and management through the introduction of private sector management techniques; Armstrong (2002) and Jones and Dugdale (2002) describe the adoption of ABC by private and public institutions;

Meyer and Rowan (1977) mentions organizational functions that are institutionalized in universities which are also important to businesses such as sales, production, advertising, or accounting and research; Brignall & Ballantine (2004) uses institution theory to study the relationships among Strategic Enterprise Management (SEM) systems, performance measurement and management (PMM) systems and organisational change programs.

Janne Jaravinen (2006) studied the institutional pressures for adopting ABC in two Finish hospitals through the view of institutional theory. Using New Institutional

theory, James (2009) examined national competition policy in relation to the implementation of balanced scorecard (BSC) in an Australian government-owned electricity provider. Alon and Dwyer (2016) examined the US Securities and Exchange Commission (SEC) allowing two different accounting methods to prepare financial statements drawing on institutional theory. Studying the implementation of management accounting by utilising the precepts of institutional theory has been widely used for decades. These are among the reasons that this study was conducted through the lens of institutional theory. While researching the use of ABC in Australia in general, ABC initiatives related to Australian universities were coupled with larger studies of ABC use in other enterprises (Baird 2007). There was a space or gap to investigate more fully the management practices focusing on ABC in Australian universities. Information gained on this research could be added to the existing body of knowledge on higher education management and the use of ABC in Australian universities.

Individual items in the questionnaire were employed to inquire as to why the university chose to use, or not to use, ABC. Was ABC selected at their institution because of Australia-wide initiatives to use ABC was encouraged (normative isomorphism)? If the universities motivation to implement, or attempt to implement, ABC was based on other universities experimentation of ABC, this could be memetic isomorphism. Both memetic and normative isomorphism could be comingled because of the transfer of employee to the university from other institutions where the employee had experience in using or implementing ABC.

There is also the notion that schools, departments or management needed better information to base decisions or to comply with governmental report requirements.

2.12 Research Proposition and Questions

ABC has been implemented in universities in many countries worldwide such as UK, USA, Italy, Estonia, and Malaysia. There have been several case studies related to the use of ABC in specific Australian universities and university departments. However, there has been no comprehensive study to systematically investigate some of the very fundamental issues about ABC. While there are many possible leads and research issues to possibly explore, this research is focussed on the assessment of the foundation questions of ABC commencing with the diffusion and implementation of ABC in Australian Universities.

In view of the literature review, the purpose of this research is to determine the diffusion of activity-based costing (ABC) amongst the Australian universities and their uses in the university departments and faculties. In order to determine the rates of diffusion in Australian universities, careful consideration needs to be made about the level of ABC implementations, and reasons for consideration, adoption and rejection of ABC methods. This research will be valuable building block in contribution to the growing body of information related to the use of activity-based costing in Australian Universities.

As a consequence of the lack of recent evidence of ABC and significant contribution made by Australian Universities collectively, and the potential benefits ABC, this

study examines the extent of diffusion of Activity Based Costing (ABC) methods and their uses in Australian universities. The overall propositions of this study are:

4. To determine the extent of ABC implementation in Australian universities
5. To examine the reasons for the adoption of ABC in Australian Universities
6. To examine the reasons for not implementing ABC in Australian universities

2.13 Summary

A review of the literature has drawn the conclusion that several researchers have researched on many aspects of ABC. This has allowed institutional theory to be considered in this research. Institutional theory asserts that organisational structures are often influenced by their environments. Two primary types of actors that shape modern institutions are the state and professional bodies. With these considerations, the research questions and propositions identified in this chapter will be tested, analysed and the results outlined in the Chapter 4.

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CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter discussed the research objectives against the backdrop of relevant literature on Activity Based Costing. This chapter presents the research strategy employed to address the research questions of section. It consists of details of the methodology adopted for conducting the present research, including sources of information, questionnaire design, data collection and handling, sampling and sample size and statistical processing. These issues have been addressed by the research questions and the proposed research propositions. The cross-sectional primary data is largely generated by administering questionnaire on all Australian Universities. The 'research design' for this study is descriptive and non-experimental.

The primary purpose of this study is to determine whether or not activity-based costing (the phenomena) is being used in Australian universities. In addition to determining the presence of the phenomenon, this study is to determine the level implementation of activity-based costing (ABC). It is expected that a many of the Australian universities have chosen to adopt/use or investigate activity-based costing (ABC) and have experimented with its use as a decision-making tool. As per Cohen, Venieris & Kaimanaki (2005) there are the enterprises using ABC (adopters), enterprises that were investigating or intending to transition to ABC (supporters),

have they chosen not to use ABC (deniers), and those who do not know about ABC (unawares)? This study will assess the universities into adopter/implementers, attempters, and those that have chosen not to explore ABC methodologies (rejecters).

Additional research objective included the assessment of reasons that underlie the choices made by Australian Universities. The research will explore the drivers of the decisions in terms of organisational, technical, behavioural and contextual factors involved in their decision.

3.2 Methodology Paradigms

A brief overview of the research approach and methodological paradigm in terms of qualitative and quantitative paradigms and specific methodologies that are to be used in collecting and analysing data.

3.2.1 Quantitative

Quantitative methodologies involve data collection techniques that are objective in both their collection and analysis methods. Quantitative information that is relatively easy to quantify in the respect that it can readily be analysed in numeric format through the use of diagrams and statistical analysis (Saunders, Lewis & Thornhill 2009). In the analysis, the data collected is compared to particular theories or analyses found in the literature. Quantitative methodology is also related to the instruments use in data collection methods such as questionnaires, surveys with mostly closed-end questions and highly structured interviews (Krosnick 1999; Saunders, Lewis & Thornhill 2009). Typical methods used to collect quantitative

data are surveys, questionnaires, observation, and individual interviews. Surveys and questionnaires are typical instruments used to collect data from large population samples. Generally, the goal of large quantitative sample sizes is to make assumptions related to the population studied as a whole (Onwuegbuzie & Leech 2007). For the purpose of this study, questionnaires will be used to collect demographic, business size, accounting methods used, and employment experience information related to a large sample population. Questionnaires will also be used to as a follow-up data collection tool to get additional feedback from study participants.

3.2.2 Qualitative

"Qualitative research methods are particularly useful in business research to understand the role of accountants and the methods of accounting used in their businesses," (Lee & Humphrey 2006, p.183).

Qualitative methods are typically used to collect data in a non-numerical format. Qualitative methodology is also defined by the data collection and analysis tools needed for research. Unstructured or semi-structured interviews, focus groups, and open-ended questionnaires are common tools used in qualitative research. The questionnaire developed for this research has both qualitative survey questions and opportunities to include qualitative responses (open ended) through carefully worded questions and opportunities to add additional comments using response "boxes." Through the use of both open-ended and closed-ended questions the researchers aim is to understand, report, and analyse the meanings of events or phenomena and how the participants view and understand their environment. In quantitative research,

the goal is to make generalisations about the population as a whole, whereas in in qualitative research the goal is usually to gain a more in-depth understanding of the practices within the sample only (Onwuegbuzie & Leech 2007a). In the case of this study, the environment is their relationship and evolvement in their businesses.

3.2.3 Mixed Methodology

Johnson, Onwuegbuzie and Turner (2007) contend that mixed methods research is the third paradigm in research methodology: quantitative, qualitative and mixed methods. Mixed methods research is a methodology that attempts to consider multiple perspectives which would include both quantitative and qualitative research. Mixed methodology research is used to select from the "strengths and minimize the weaknesses of single research studies and across studies" (Johnson & Onwuegbuzie 2004, p.14). The use of mixed methods research would appear to support the triangulation of information by combining richer data from qualitative studies with the strong statistical information from quantitative data and analysis (Denzin 2012). Mixed methodology would utilize the best methods to collect and examine data to resolve the research question or record phenomena and is consistent with the research philosophy of pragmatism (Johnson, Onwuegbuzie & Turner 2007; Sharp et al. 2012).

3.3 Sources of Information

Multiple sources have been utilised in order to gather relevant data for this study. These are discussed below under two broad categories of secondary and primary sources of information and data.

Various secondary sources have been tapped into for this study. Internet-based database at the Charles Darwin University library was the major source of secondary data. It was used extensively in the initial stages of the research to identify relevant literature on ABC in general. The availability of secondary data on ABC adaption in Australian services sector is generally limited.

Information gathered through web searches was valuable in identifying general information on ABC. Information on ABC implementation in Australia however, was insufficient, scanty and highly diffused.

Reference libraries at other Australian institutions were used to locate articles on ABC in Australia that were identified through Internet search at CDU Darwin. While a reasonable number of articles on ABC in Australia were eventually traced, overall there was limited amount of literature on the scope of ABC implementation in Australian universities operating locally. Generally, the review of secondary data indicated that other jurisdictions such as the UK attracted a much greater level of research efforts compared to Australia in understanding different aspects ABC adoption and implementation.

Several methodological issues were considered in order to systematically assess the research propositions. Given the fact that secondary data with sufficient validity was quite difficult to access from various data sources, primary data collection was considered necessary. A survey procedure with top-level executives that were

responsible for the governance of Australian Universities seemed to be the most appropriate way to explore the research issues.

An electronic questionnaire was the major instrument of generating primary information in this study. Personal interviews were conducted in two separate stages of this research to augment the pool of primary information. Pre survey in-depth interviews were conducted as part of the questionnaire design. Post survey interviews were conducted to supplement the pool of primary data gathered from questionnaire responses.

Post survey interviews were conducted with 2 respondents, to seek clarification on the reported views and opinions on ABC implementation in Australian Universities. These interviews were insightful in interpreting the responses to address the research questions.

3.4 Population

The population includes all 40 Australian universities published by the Australian Education Network (AEN 2016).

Table 3.1: Universities shown below

1 Australian Catholic University
2 Australian National University
3 Bond University
4 Central Queensland University
5 Charles Darwin University
6 Charles Sturt University
7 Curtin University
8 Deakin University
9 Edith Cowan University

10 Federation University Australia
11 Flinders University
12 Griffith University
13 James Cook University
14 La Trobe University
15 Macquarie University
16 Monash University
17 Murdoch University
18 Queensland University of Technology
19 Royal Melbourne Institute of Technology
20 Southern Cross University
21 Swinburne University of Technology
22 Torrens University
23 University of Adelaide
24 The University of Canberra
25 University of Melbourne
26 University of New England
27 University of New South Wales
28 The University of Newcastle
29 The University of Notre Dame Australia
30 University of Queensland
31 University of South Australia
32 University of Southern Queensland
33 University of the Sunshine Coast
34 University of Sydney
35 University of Tasmania
36 University of Technology Sydney
37 The University of Western Australia
38 University of Wollongong
39 Western Sydney University
40 Victoria University

3.4.1 Sample Frame

The sample frame will include university chief financial officers (CFO's) or finance directors (or equivalent titles) from 38 Australian universities. Multiple contacts were made to the participants to increase the number of responses. This approach has proven to be very effective in providing higher response rates and collecting quality data (Gosselin 1997, p. 110).

Thirty-eight universities were chosen for the sample. Two universities were not included in the analysis; one, because of the lack of readily available contact information and the other indicated they did not want to participate because they expressed their belief that ABC was only used by a few universities in Australia. Thirty-nine universities were sent the questionnaire/survey.

3.4.2 Non-response Bias

To test for non-response bias an analysis will be made of approximately the first portion of the returned surveys and compared with a final portion using t-tests to determine the levels of significance in the variation of the samples (Chenhall & Langfield-Smith 1998, p. 2; Ferreira, Moulang & Hendro 2010, p. 930; Schoute 2011, p. 125; Totten, Panacek & Price 1999, p. 29). An insignificant variance would provide support for no material non-response bias. If there is a significant level of variance, further investigations would be expected. As mentioned by Cagwin & Bouman (2007, p. 16) there are no tests to "ensure that the study is free of non-response bias," but there are comparisons that can be made to report differences and provide support for the non-response bias assertion.

3.5 The Survey Instrument

3.5.1 Survey Purpose and Structure

For the purpose of this study the questionnaire survey was used to collect predominately quantitative general information about universities and their cost accounting function. Participants were purposely targeted through an initial scan of university websites to identify the potential participants. Once relevant potential

participants were identified an electronic link to an online survey questionnaire through Survey Gizmo was sent to the sample population to reduce interviewer bias. The survey was designed using different sections of predominately closed-ended questions: demographic information, classification questions, and three sections for adopter/implementers, attempters, and those who chose not to investigate ABC. Pilot testing of the survey instrument was conducted to evaluate the questionnaire and to discover questions and proposed responses that need clarification.

General demographic information of the participant and the university including dollar ranges of annual revenues ($100-300 million, $301-500 million $501-700 million and over $700 million), ranges of the number of employees as a proxy to determine organisational size. There were also questions related to the current position of the respondent, age, years of experience and academic and professional qualifications. The last two questions in the demographic portion of the questionnaire were two "classification" questions which are designed to determine if the university is presently using ABC (implementers); if the university has attempted or implemented ABC, but are no longer using the methodology (attempters); and finally, if the university has decided not to attempt an implementation of ABC (rejecters). It is significant to separate these three groups because it provides an understanding of the diffusion of ABC in Australian universities. See diagram of the questionnaire below.

Adopter/implementer questions will include organisational, behavioural, and technical questions which many be subdivided to include descriptive, relational and

causal questions. Questions will include the number of activity drivers used, a list of drivers, and how ABC is being used in their university. A few answer points will offer the opportunity to include "no opinion" or "I do not know" as a quasi-filter to 'lay the groundwork' for more in-depth discussions through individual interviews (Diamond 2000, p. 245). Each question is designed so the respondent does not need to collect confidential or private information about themselves or their organisation. Additional information will be provided to the participants regarding confidentiality and anonymity and an independent survey company, Survey Gizmo, will hold the data independent from the researcher (see the Research Ethics section of this paper for additional safeguards).

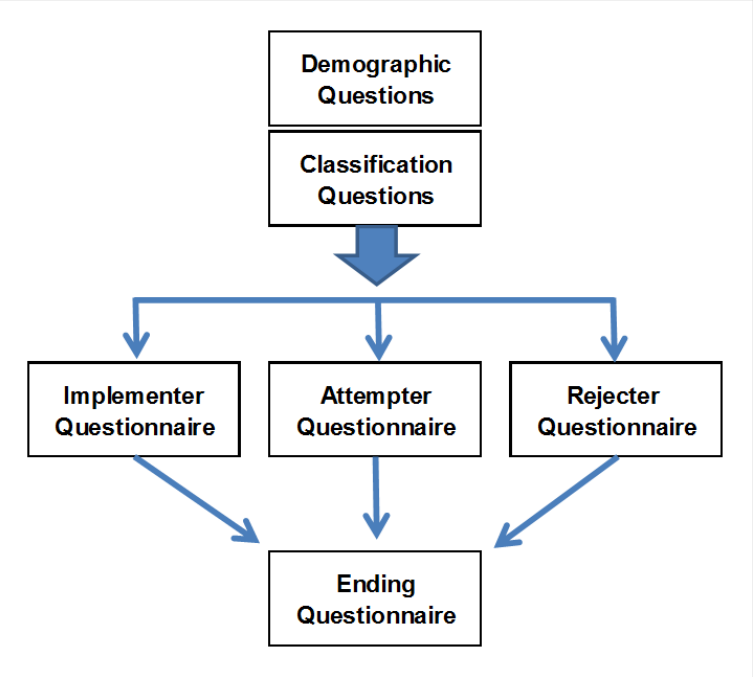
3.5.2 Questionnaire Surveys

Surveys have been widely used in management accounting but not without criticism as to reliability (Totten, Panacek & Price 1999; Van der Stede, Young & Chin 2005). If surveys are "properly designed and executed and described," they can be a source of high-quality data from large population samples (Diamond 2000, 225-226). As per Diamond (2000), the principal factor when using the survey method is in how the survey is deployed. The processes in executing a survey study requires specific steps: identifying an assessable hypothesis or phenomena, establishing the best methods to be utilized, identifying a population, selecting sample from a population, collecting data, and determining how the information collected can be analysed and interpreted, and composing the results into a readily useful format.

In the survey framework for this study, we will follow five general categories for the formation of the instrument: (1) purpose and design of the survey, (2) population definition and sampling (see Population and Sample), (3) survey questions and structure (**Appendix B**), (4) data entry and accuracy, and (5) disclosure and reporting (Diamond 2000; Van der Stede, Young & Chen 2005). Data entry, accuracy (4) and disclosure and reporting (5) are discussed in **Chapter 4: Analysis**. Surveys are an inexpensive method to collect objective information from a large population and mail/email surveys avoid interviewer bias (Abernathy, Chua, Luckett & Selto 1999). Each question in the survey needs to be worded and reviewed to minimize researcher bias, order effect bias, and not to lead the participants into their responses.

The survey instrument will begin with "This project seeks to understand and explore the diffusion of activity-based costing in Australian universities." It contains organisational, behavioural, and technical questions which many be subdivided to include descriptive, relational and causal questions.

Figure 3.1: Questionnaire Structure



3.5.3 The Questionnaire

The bulk of primary data for this research was gathered through a cross-sectional survey using a questionnaire presented in appendix A. The survey method has several advantages in terms of reaching geographically dispersed respondents at a relatively low cost (Kumar, 2000, 171, Malhotra, 2001).

The research questions and propositions provide the basis for information specifications. The questionnaire design ensured that it encouraged respondents to contribute to data collection process. The survey instrument, administered only on Australian universities firms is divided into sections, each representing a key research variable.

The questionnaire developed for this research has both qualitative survey questions and opportunities to include qualitative responses (open ended) through carefully worded questions and opportunities to add additional comments using response "boxes." Through the use of both open-ended and closed-ended questions the researchers aim is to understand, report, and analyse the meanings of events or phenomena and how the participants view and understand their environment. In quantitative research, the goal is to make generalisations about the population as a whole, whereas in in qualitative research the goal is usually to gain a more in-depth understanding of the practices within the sample only (Onwuegbuzie & Leech 2007a). In the case of this study, the environment is their relationship and evolvement in their businesses.

The majority of questions had a fixed range of alternatives. This was useful on two counts: (1) to minimize the potential of inconsistency due to misinterpretations and (2) also to enhance the choice of analysis. Most open-ended questions sought respondents' background information and clarification.

Inappropriate choice of the questionnaire language has been identified as an important source of 'non-response' in international surveys (Kumar, 2000, 210). Given the choice of the respondents for this research and also the fact that the survey was directed at the senior management of the responding organizations, the questionnaire was prepared in English language as it is widely used as the language of business.

Detailed instructions for the questionnaire were also provided in English to all respondents for a better understanding of key research issues and to minimise non-response. While the use of 'jargon' or industry specific terms is commonly used in questionnaire design, effort was made in this research to avoid the use of technical and unfamiliar words or terms. Simple and easy-to-understand words and expressions were used to facilitate the understanding of questions. Pre-testing was useful in ensuring the simplicity of questionnaire language, instructions and skip pattern. Details of the pre-testing are provided later in this chapter.

3.5.4 Survey Questionnaire

There were a total of 71 questions in the survey. No single respondent had access to all 71 questions because the questions. The survey questionnaire was divided into 6 parts: Part 1: voluntary participation, Part 2: demographic questions, Part 3:

implementers and users of ABC, Part 4: attempters, and Part 5: rejecters. The survey ends when the respondents complete the last question of Part 3, 4 or Part 5. The respondent is routed to a new survey which asks if they want to receive a copy of the abstract of the research.

3.5.5 Part 1: Introduction

There was a single introductory paragraph describing the nature of the research, why they were selected to participate in this research, statement of anonymity, and they could withdraw at any time. In this introductory section, the questionnaire asks whether the respondent agrees to participate with a link to consent details contained in the Plain Language Statement. A 'Yes' response leads the participant to the questionnaire. A 'No' response leads the participant to a 'Thank You' page and exits from the survey. There is also an additional link to a copy of the Plain Language Statement which was also an attachment to the email presented to prospective respondents.

Three bullet points followed the introductory paragraph:

(1) participation was voluntary,

(2) by pressing the 'submit' button at the end of the survey they would be expressing their informed consent, and

(3) the third bullet indicated they could access the Plain Language Statement and return to the survey.

3.5.6 Part 2: Demographic Data

There were 12 demographic questions such as age and gender were intended for all participants. The survey was only sent to adult CFO's in Australian universities. Gender choices were Female, Male and X ((indeterminate/intersex/unspecified) as examples given in accordance to Australian Government Guidelines on the Recognition of Sex and Gender, (AGO 2013, p. 6). "Individuals should also be given the option to select Male, Female or X, in line with the sex and gender classification system set out in paragraph 19." As per paragraph 19, "Where sex and/or gender information is collected and recorded in a personal record, individuals should be given the option to select M (male), F (female) or X (Indeterminate/Intersex/ Unspecified)" (AGO 2013, p. 4). The demographic information is important to this study by helping to define the different attributes of the respondent universities and the attributes of the individual respondents who completed the survey. Since this research is related to the efforts of CFO's, Financial Directors, Accounting Managers, etc., the following six (6) are about the respondent's education, professional qualifications and professional experience. Two questions ask if the respondent had any prior experience with ABC and four (4) questions about the respondent's university size, revenue ranges, student population ranges, and memberships (Australian Technology Network, Innovative Research Universities).

3.5.7 Part 3: Classification Questions

There were 2 classification questions that were carefully worded to classify whether the participant could be classified as an "Attempter, Current Implementer or Rejecter" of Activity-based Costing.

3.5.8 Parts 4 and 5: Ending information

In this section, participants have the opportunity to get a copy of the extract and or to participate in the one-on-one interview.

3.5.9 Classification Questions

Questions 13 and 14 are 'classification questions' aiming to categorize universities are current users of ABC, prior testers or former users of ABC, and universities that chose not to investigate ABC at their institution. All three classifications are valid positions for universities to assume. Some universities are highly innovative and regularly promote advanced management techniques while other universities have determined that ABC does not fit their management needs or that ABC is not an appropriate methodology for universities.

Questions 13 and 14 route the participant to one of three separate questionnaires: (1) Implementers: users of ABC (2) Attempters: universities that have attempted to use ABC, but felt it did not fit their needs or skill sets, and (3) Rejecters: universities that tested or studied the methodology and chose not to implement ABC. See the full questionnaire in Appendix X.

The word "Implementers" and "Attempters" were the title of Part 3 and Part 4 of the survey questionnaire. The title of Part 5 of the questionnaire was "Universities that chose not to implement ABC"; the term 'rejecters' was not used in the actual questionnaire to avoid the use of a term that may have caused bias or implied prejudice to the participant.

3.6 Pilot Testing

The survey questionnaire was pilot tested as to ease of use, ease in understanding the questions and available responses, completeness, length of time to complete survey, quality of responses for statistical analysis, reduction of question and order bias, and for ethical considerations (Krosnick 1999; Tolich & Davidson 2011; Totten, Panacek & Price 1999). The pilot testing was used to identify problems with the survey structure, data collection protocols (procedural methods) and the overall structure of the study (Teddlie & Tashakkori 2009, p. 203). Analysis of the quantitative data is discussed in Chapter 4. Ten people were sent links to the questionnaire for pilot testing. Seven were accountants of which four were PhD CPA's and three were CPA's with an MBA or BA. Three were non-accounting PhD's that have experiences with surveys and research.

Responses were received from the pilot testing related to understanding of questions and answers. A few questions were eliminated because of similarities with other questions and the order was changed for a few questions.

3.7 Response Rates

Response rates of 90% can offer substantial reliability the sample will represent the views, attitudes and values of the population, assuming the sample is of adequate size in relation to the population. Low response rates may logically reduce the credibility of the data collected in relation to the complete population. The expected response rate for this study will be 75% based on Totten, Panacek & Price (1999)

who state at least a 75% is desirable. The authors also mention that "even small numbers of non-respondents may cause serious bias" (p. 28).

Response rates can be problematic and steps will be needed to be implemented to maintain an acceptable level of responses. Multiple reminders will be sent to participants to maintain contact and to explain the importance of their participation. The design of the survey questionnaire instrument is of paramount importance. If the estimated time to complete it is too long, respondents may choose not to participate or exit the survey before it is completed. A response rate that is too low may substantially affect the survey results (Totten et al. 1999, p. 27). Contacting potential respondents prior to emailing the survey link may increase the response rate.

A cover page accompanied each email survey with an initial sentence to motivate and encourage potential participants. Items to be covered in the questionnaire included the research study topic, the importance of the research, the importance of the participant's responses, and that other professionals are going to be part of the study survey. Their responses will be confidential and the participants will remain anonymous and their identity will not be associated with their responses. Contact information was provided if the respondents have questions (Totten et al. 1999).

Part of the motivation for participation will be: (1) the respondents will get to show what they are doing and (2) they will get the benefit of being part of a professional survey (Totten et al. 1999; Aagaard-Hansen & Johansen 2008). Ethics approval for the use of the CDU logo and letterhead in communications with participants will

lend credibility to research in the eyes of the participants and may provide participants with confidence and increase the response rate. The guidance of the research ethics committee will help to ensure the research is conducted within proper boundaries and follow strict ethical standards.

3.8 Research Ethics

3.8.1 A Brief History of Research Ethics

There has been a growing concern about research ethics for a large part of the last century. The Nuremberg Trials of 1945-1946 were actually a number of separate trials in addition to the well-known International Military Tribunals (Parsell, Ambler & Jacenyik-Trawoger 2014). One of the other trials was related to Nazi medical personnel who were tried for crimes against humanity (Aagaard-Henson & Johansen 2008; Biddiss 1997; Rhodes 2010). One of the charges against the accused was for performing medical experiments, without the subjects' consent. As a result of the trials the Nuremburg Code was formed and has been the formal foundation of modern biomedical research: avoid harm and consent.

Nazi biomedical research was not the only indignity in medical research. In the Tuskegee Syphilis Study from 1932-1972, researches denied certain groups in the study medical treatment that could have cured their ailment (Aagaard-Henson & Johansen 2008). Other disreputable military studies were conducted form WWII to into the 1960's (Walsh 1965).

In 1964 the Helsinki Declaration was adopted by the World Medical Association to build on the Nuremberg Code. Research ethics reflect the basic ethical values and favored practices in different areas of study (Aagaard-Henson & Johansen 2008, p. 16; Parsell, Ambler & Jacenyik-Trawoger 2014). In 1965 the United States the National Bioethics Advisory Commission (NBAC) focused on the "protection and the rights of welfare of human research subjects" (p. 16). In 1999 the Association of Social Anthropologists (ASA) published three key themes: informed consent, harm, and benefits of the population studied. The ASA also addressed the subject of intellectual rights of ownership of the research (Aagaard-Henson & Johansen 2008, p. 16).

3.8.2 Informed Consent & Voluntary Participation

"Voluntary informed consent is universally accepted as a precondition for scientific research involving human beings" (Marshall et al. 2006). Informed consent addresses other issues related to the rights of individual participants other than giving their permission to participate in a study: minors and others who are legally incompetent. The NBAC noted that no participant in a research study may participate without voluntary informed consent for protection of the vulnerable. All of the aforementioned lead to the modern ethics principles of: voluntary participation, informed consent and do-no-harm.

3.8.3 Avoiding Harm & Avoiding Deceit

Avoiding harm for participants includes the concepts of safety, dignity, and privacy of the subjects (Aagaard-Hansen & Johansen 2008). This includes the long-term

outcomes that may develop from the research. 'Confidentiality' is related key element to avoiding harm in business and other research. Long-term effects would include not allowing unauthorised access to data by inappropriate individuals or organisations to information that was meant to be held in confidence. The linkage of avoiding harm and confidentiality would be the dissemination of private information of participants or company information that could cause undue harm if disclosed.

3.8.4 Confidentiality & Anonymity

Confidentiality and anonymity are not the same although they may appear to be. A company that participates in a research study may forego anonymity and find it acceptable, if not desirable, to be disclosed as being part of the research project. However, private information that is disclosed to the researchers is not to be disclosed. This information is confidential and the researcher must protect this information from unauthorised access. Employee participants who are part of a survey related to the research need to remain anonymous in order for them to have the freedom of providing valuable information to the researcher (Chang, Witteloostuijn & Eden 2010). There individual comments would be confidential and their identity would be anonymous. The total analysis of their comments would be disclosed but the association of the participant with their comments would remain with the researcher or an independent survey analysis provider: SurveyGizmo.

As related to one-on-one interviews, the identity of the participants will not likely be anonymous. Often management helps to select employees with important knowledge of the company's strengths and weaknesses to aid in the research.

However, the direct association of the comments of the individual will remain confidential and not disclosed. With focus groups the participants are not anonymous nor are their comments confidential because all members of the focus group can hear and reply to each participant. In this type of format, the structure of the questions or topics of discussion needs to remain in control of the researcher to avoid discussions unrelated to the topic at hand.

As it relates to this study, individual interviews and surveys will be the primary techniques used to gather information about a specific company or phenomenon. Focus groups are not part of the initial plan for this study. All of the survey questionnaires distributed to participants via email containing a link to our survey questionnaire provided by Survey Gizmo, an independent survey provider. The individual names, contact information, and responses will be held by the independent survey provider only and names and contact information will be made available to the researcher for use in contacting participants for one-on-one interviews or those who chose to withdraw from the study.

In order to address the issues in this study, a "Plain English Language Statement" will be provided to each participant stating the purpose of the study and the risks, inconveniences and remedies associated with their participation (Deschamps 2011). A Letter of Consent will also be provided electronically with the survey link in order for the respondents to informed consent and voluntarily participation in the study.

3.8.5 Other Ethics Considerations

Self-interests of the researcher, profit motives, and conflicts of interest and need to be considered in research (Deschamps 2011; Gallagher 2011)). There is no profit motive or conflicts of interest known to the researcher other than the successful completion of Doctorate in Business Administration (DBA). The self-interest of the DBA is disclosed in the Plain English Language statement presented to all participants.

Other ethical considerations would include: privileged access, intrusion, vulnerable populations, plagiarism, validity, power and transparency (Quinlan 2011). Much of privileged access in this project has been discussed through confidentiality and anonymity. Intrusion and inconvenience will be mentioned in the plain language state and in the letter of consent. Plagiarism is address throughout this project and no intentional copying the work of others without referencing their contributions to in this research project. Validity, perceived power of the researcher and transparency are important considerations and all ethics and research validity are thoroughly investigated by the Charles Darwin University (CDU) research committee. In addition to reviewing and approving valid research opportunities the importance of research committees in evaluating ethics in research cannot be understated. Research committees are valuable resources for protecting the researchers, the institutions they represent, the research participants and the science of research.

3.9 Summary

A mixed method that includes quantitative and qualitative approaches is used for this research. It is an attempt to consider multiple perspectives and to minimize the weaknesses of single research study. A questionnaire with five parts is prepared and sent to all 39 universities in Australia.

* * * * *

CHAPTER 4

DATA ANALYSIS

4.1 Introduction

The previous chapter considered methodological and data preparation issues. This chapter looks into the next stage of the research process – analysis of data. The primary data obtained through questionnaires is analysed by using the appropriate statistical procedures. Given the small size of the population and respondents, descriptive statistical procedures of frequency distributions and cross-tabulations are used to understand the composition and background of respondents of this study. Respondents' characteristics are analysed to create a profile of participants. Further data analysis is conducted to explore the key research questions highlighted in previous chapters and listed below:

- To determine the extent of ABC implementation in Australian universities
- To examine the reasons for the implementation of ABC in Australian universities
- To examine the reasons for not implementing ABC in Australian universities

As a general approach, key responses are assessed at a macro level and then progressively dis-aggregated using respondents' characteristics. Primary data obtained through open ended responses and interviews are also considered simultaneously at appropriate places in this chapter to better understand the views of respondents for key research questions.

As reported in the previous chapter, the survey targeted all Australian public universities. The questionnaire survey link was sent to all Australian universities' Chief Financial Officer (CFO's) or their equivalent listed in Australian University Network (http://www. Australian universities. com.au/list/). Three of the forty-two universities on the list did not have readily available contact information. After multiple attempts using various methods to obtain appropriate contact information, three universities were eliminated from the list of possible respondents. Thirty-nine Australian universities were sent email requests with a link to the research questionnaire and therefore constitute the population of this research.

The following sections provide details of the population characteristics followed by an assessment of the key characteristics of the respondents. The significant findings of the survey constitute the next section of this research. The three key sections that follow refer to:

- The **characteristics of the population** (39 universities),
- The **characteristics of the survey respondents**, and
- The **significant findings** in the context of the research questions of the study as mentioned earlier.

4.2 Characteristics of the population

The population of this study- the public Australian universities –are geographically dispersed in all states and territories including the Northern Territory (NT) and Australian Capital Territory (ACT) of Australia. There is however a greater concentration of universities in the larger states such as New South Wales (NSW), Victoria and Queensland. While most universities focus their activities to a single

location in Australia, there are some universities with operations in other countries and with multiple campuses including multi-site domestic delivery of courses. This, we argue adds to the operational and strategic decision making complexities of these institutions. A small number of respondents can be termed as ‘dual sector’ institutions with a significant Vocational Education and Training (VET) component. Almost all universities offer a large proportion of their courses in both ‘internal’ and ‘external’ modes. Some institutions such as the Charles Darwin University (CDU) has a significant focus on indigenous teaching, learning and research. Similarly almost all universities have targeted both domestic and international students.

The population of Australian universities for this study comprise of the following:

1 Australian Catholic University
2 Australian National University
3 Bond University
4 Central Queensland University
5 Charles Darwin University
6 Charles Sturt University
7 Curtin University
8 Deakin University
9 Edith Cowan University
10 Federation University Australia
11 Flinders University
12 Griffith University
13 James Cook University
14 La Trobe University
15 Macquarie University
16 Monash University
17 Murdoch University
18 Queensland University of Technology
19 Royal Melbourne Institute of Technology
20 Southern Cross University
21Swinburne University of Technology
22 University of Adelaide
23 The University of Canberra
24 University of Melbourne
25 University of New England
26 University of New South Wales

27 The University of Newcastle
28 The University of Notre Dame Australia
29University of Queensland
30University of South Australia
31 University of Southern Queensland
32 University of the Sunshine Coast
33 University of Sydney
34 University of Tasmania
35 University of Technology Sydney
36 The University of Western Australia
37 University of Wollongong
38 Western Sydney University
39 Victoria University

It is important to acknowledge that collectively, universities make a significant contribution to Australian economy. Annual turnover, for example, for the year 2016 of all Australian universities according to the Department of Education publication (2016) (https://www.education.gov.au/finance-publication) was over AUD$30 billion dollars [mean $802 million; median $600 million]. The older universities of NSW, Victoria and Queensland are the biggest economic contributors with their annual budgets and turnover in billions of dollars each financial year. Furthermore, in 2016 Australian universities serviced 961,404 Equivalent Full Time Students (EFTSL) and employed 127,545 Full Time Equivalent (FTE) staff (CAUDIT 2018). The average staff and students per university in 2018 was 3,270 and 24,651 respectively. The overall economic and social contributions, it is argued, therefore is clearly substantial and multifaceted. Collectively, the higher education sector is the prime mover of research and innovation in many sectors including health, tourism, engineering and information technology. Furthermore, all universities are proactive in providing education and training opportunities to indigenous and socially disadvantaged segments of the Australian society.

4.3 Response Rate

As stated earlier, thirty-nine universities were sent emails with links to an online survey and were asked a wide range of questions about the activity-based costing (ABC). Twenty-seven Australian Universities responded to the survey questionnaire within the specified time period providing a response rate of 69% (n=27/39). Scrutiny of responses indicated that three (n=3) surveys were incomplete, deemed unsuitable for analysis and therefore excluded from overall data analysis, providing an effective response rate of 61% (n=24/39). This response rate compares favourably with similar studies in Australia and overseas particularly with Baird's (2007) study referred to as "Adoption of activity management practices in public sector organizations" which achieved an overall response rate of 46 percent. Sectoral response rate in Baird's (2007) study varied in a noticeable manner. There was a response rate of 43 per cent for governmental business enterprises and 56 per cent for universities. Although the response rate achieved in this study was higher, the small population size (n=39) and smaller response group (n=24) created constraints in term of subjecting the primary data to more rigorous statistical analysis, particularly in making statistical predictions about the entire population of Australian universities.

4.4 Characteristics of the respondents

This section now considers the demographic characteristics of the respondents both in terms of the institutions they represent and in terms of the individuals providing information on behalf of the responding institutions. The demographic information is presented in various tables that follow. Collectively, based on the individual and

institutional characteristics, a profile of the respondents is created. This will assist in determining the extent to which these findings can be extended to the entire population of Australian universities in a qualitative manner. We will commence this section with a discussion of institutional characteristics.

4.5 Location

Respondent's geographic location is a critical feature of Australian Universities. Table below shows basic characteristics of the 24 respondent universities in terms whether they view their institutions as a city based or a regional university.

Table 4.1: City based or Regional Universities

		Count	Percentage
Is your university a city based university or regional university?	City based	13	54.2%
	Regional university	11	45.8%
	Total	24	100.0%

It is clear from the table above that out of 24 respondents, slightly more than half (13/24) respondent universities are city based and 11 respondents are based in regional areas of Australia. This is a self-reporting question where the respondents were asked to indicate the primary location of their main campus. It is important to note, and stated earlier, that many universities have multiple campuses. Some regional universities for example have their main campus in a regional area while they also have other campuses in cities such as Sydney, Melbourne, Brisbane and other key cities of Australia. The location information is also indicative of the location where 'top management' of the institution is normally based and strategic decisions made and implemented.

4.6 University Size

Responding universities in this research differ in terms of their respective sizes – which is similar to the overall population characteristic. Two survey questions were used as proxies to determine the size of the responding organisations including their annual revenue and number of employees. The ranges for annual revenues in millions included: under $100; $100-300; $301-500, $501-700, and over $700 million. Ranges of the number of employees included options of - less than 1,000; 1000-2000; 2001-3000; 3001-4000; 4001-5000; more than 5,000. Baird (2007) has used a similar size classification approach in a previous study. While 'student numbers' can be used another size indicator, in this research university size was not assessed by number of students enrolled because there are large variations in enrolment statistics based on number of students enrolled, equivalent full time students, and higher education versus TAFE/VET sector enrolments particularly for dual sector universities.

Table 4.2: Questionnaire analysis

9. What are the approximate total annual revenues reported on your university's most recent annual report?*						
Revenue(millions)	<100	100-300	301-500	501-700	>700	
n=		3	5	6	10	24
percent		13%	21%	25%	42%	100%

Table 4.3: Questionnaire analysis

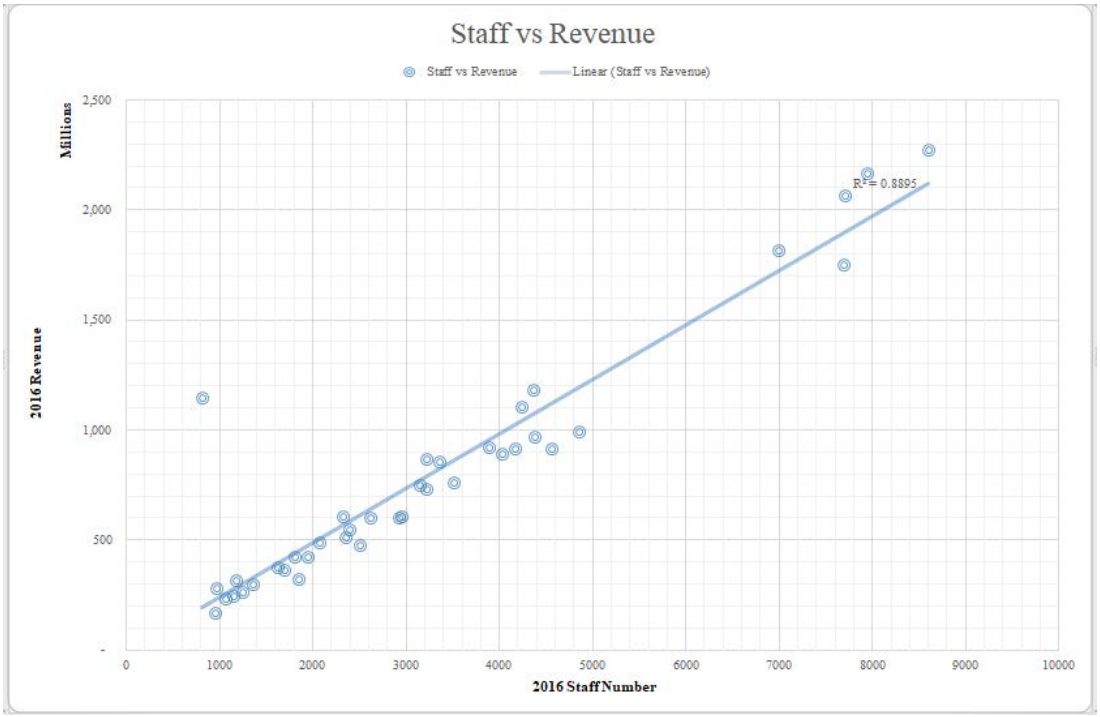
10. What is the approximate number of employees at your university?							
No. of employees	<1000	1000-2000	2001-3000	3001-4000	4001-5000	>5000	
n=		5	5	6	4	4	24
percent		21%	21%	25%	17%	17%	100%

Tables above provide an indication of a wide cross section of universities in terms of annual turnover and number of employees. Ten of the 24 respondents were universities with employee numbers: less than 2,000, with remaining 14 with more than 2000 employees. There is a noticeable separation between respondents in terms of their revenues. A very large proportion (16/24) of respondents have annual turnover that is greater than 500 million compared to 8/24 respondents with revenues in 100-500 million dollars range. There is a clear pattern in terms of overall revenue and the number of employees. The positive correlation between the revenues and the number of employees indicates consistency in using either or indicators of institutional size.

Breakdown of primary responses further indicates that there are 5 universities that have revenues of $100-500 million and have 1000-2000 employees; there are also 5 universities with revenues of $301 to more than $700 million with 2001-3000 employees. There are 6 universities with revenues $301 to more than $700 million; 4 universities with revenues of $501 to more $700 million with 4001-5000 employees, and finally, 4 universities with revenues greater than $700 million that have more than 5000 employees.

It is important to note that the strong evidence of a linear relationship between the staff and revenue for thirty-nine university with one outliner. University with higher revenue tend to have larger staff and vice versa.

Figure 4.1: Staff vs Revenue



4.7 Affiliation

In recent years many Australian universities have started to form groups or alliances of likeminded institutions in order to achieve their strategic objectives such as lobbying local, state or national governments also in terms of achieving economies of scale in terms of marketing et cetera. As highlighted by an interviewee, "*membership or affiliations such as G8 provides great opportunity to share critical information with other members and learn ways of doing things more effectively"*. It was therefore found necessary to find out if the responding universities were part of any groupings. The survey asked if the respondent's university was part of any particular group such as the Group of 8; Australian Technology Network (ATN); Innovative Research Universities (IRU); Regional Universities Network; and

Australian New Generation Universities (NGU). The purpose of this question was to seek further insight into respondents' strategic approach and operations (Yao, Xu & Lu 2003, p. 79).

Table 4.4: University Grouping

12. Is your university a member of:	F-M	totals	perc.
Group of 8 (Go8)	1-4	5	21%
Australian Technology Network (ATN)	2M	2	8%
Innovative Research Universities (IRU)	3-2	5	21%
Regional Universities Network	3-1	4	17%
Australian New Generation Universities (NGU)	1M	1	4%
I do not know	4-3	7	29%
		24	100%

Many universities it seems (8/25) either did not know or possibly were not a member of any of the groups listed above. However, Go8, IRU and Regional Universities Network were the most noticeable alliances.

4.8 Individual background

The characteristics of **individual respondents** suggest that they come from a wide range of backgrounds in terms of gender, age, organisational titles, education and experience. Of the 24 respondents, there were slightly more male respondents – (11 female and 13 male - 46-54%). Primary data on age distribution indicated that a significant proportion (14/24) is within 40-49 years age category. However, there were more female (female n=8, male n=6) respondents between the ages of 40-49 than male. The 50-59 years age group was dominated by male respondents. As indicated in the tables below there was 1 female respondent and 5 male respondents from the older age bracket.

Table 4.5: Age and Gender Analysis

1. Age Range	30-39	40-49	50-59	60-69	>70	total
n=	4	14	6	0	0	24
percent	17%	58%	25%	0%	0%	100%

2. Gender	Female	Male	Unspecified	total
n=	11	13	0	24
percent	46%	54%	0%	100%

Organisational titles often indicate position that an individual occupies within the organisational hierarchy and the corresponding role that is expected of the title holder in strategic decision-making process. The reported data indicates quite distinct spread of individual and organisational titles. Collectively however, most titles of responding individuals suggest that the respondents hold senior and executive positions within their respective organisations.

The organisational titles of respondents suggest that almost all of them were part of middle to senior management within their respective organisations. Of the twenty-four respondents, two respondents were deputy vice chancellors, ten respondents had director of finance titles or similar, including three associate directors. Five were CFO's with one 'acting' CFO, six respondents were titled as finance managers or similar titles, and one respondent was a senior accountant. All titles were deemed appropriate in having access to relevant information to provide answers to all questions of this research.

Table 4.6: Participant Job Title

2	Deputy Vice Chancellor - Finance & Planning
10	Directors
5	Chief Financial Officers
6	Managers of reporting, management accounting, financial analysis, budgeting & course costing, financial projects
1	Senior Accountant
24	Total

'Educational qualifications' attained by an individual is one of the key indicators of the quality and performance of an employee. It is pertinent to note that all respondents in this research had university qualifications with 42% (n=10/24) of the respondents listed bachelor's degrees as their highest level education achieved and 58% (n=14/24) had advanced degreed (masters/PhD). There was a larger percentage of respondents with advanced degrees (62.5%, n=10) at the larger universities ($501million and above) than those with bachelor's degrees (37.5% n=6) when compared to the smaller universities.

Table 4.7: Participant Education Level

3. Highest education level of education achieved							
Revenues in $mill.	<100	100-300	301-500	501-700	>700	Totals	Percent
Bachelor	0	2	2	3	3	10	42%
Advanced	0	1	3	3	7	14	58%

Advanced degrees (masters/PhD)

4.9 Experience

Consistent with educational qualifications, all respondents in this research reported extensive experience working in the accounting profession. Almost 92% (22/24) had

more than 15 years' experience and 67% (16/24) had more than 20 years' experience.

Table 4.8: Participant Experience Level

4. Years' experience in the accounting profession						
Years	<5	6-9	10-14	15-19	20 >	total
n=	0	1	1	6	16	24
percent	0%	4%	4%	25%	67%	100%

The primary data also indicates that many respondents had extensive work experience in the Higher Education sector (Universities) in Australia. Thirty-eight percent (38%, n=9) of the respondents were in their current position for 5-10 years; Twenty-nine percent (29%, n=7) were in their current position for 3-4 years; and 8% were in the current position more than 10 years.

In addition to accounting experience, most respondents had quite diversified prior experience in terms of a wide range of industry sectors such as experience in banking and finance; mining, non-profits, hospitality, medical, shipping and travel, 'fast moving consumer goods' and wholesale/retail. Overall services sector experience is more pronounced in majority of respondents with a limited few (3/24) from the manufacturing sector background.

The foregoing characteristics reported by responding universities do not suggest anything extraordinary in terms of the features of research participants in terms of their size, location or membership of any particular group. As stated earlier while it is statistically difficult to assess the similarities between the respondents and the

population characteristics, in a qualitative sense it clearly appears that the respondents in this study are similar to the population of Australian universities in terms of the stated demographic characteristics such as number of employees, annual turnover and their primary location of operation.

Similarly, based on the individual characteristics of the respondents, we hold the view that the participants in this survey are highly qualified individuals that have significant organisational responsibility to manage accounting and finance function within their respective organisations. That is also clear indication that these individuals have a good understanding of ABC as a costing. The demographic characteristics of individuals and the organisations they represent collectively, in particular the qualifications and experience, provide high degree of reassurance in terms of the credibility of these respondents in addressing specific issues raised in this research questionnaire. The demographic profile provides confidence to the researcher that all respondents had a high level of comprehension and understanding of research issues.

4.10 Findings of key research question

This section now explores the findings and considers them in relation to the three research questions that were identified in the previous chapter and also indicated earlier in this chapter namely:

- To determine the extent of ABC implementation in Australian universities
- To examine the reasons for the implementation of ABC in Australian universities

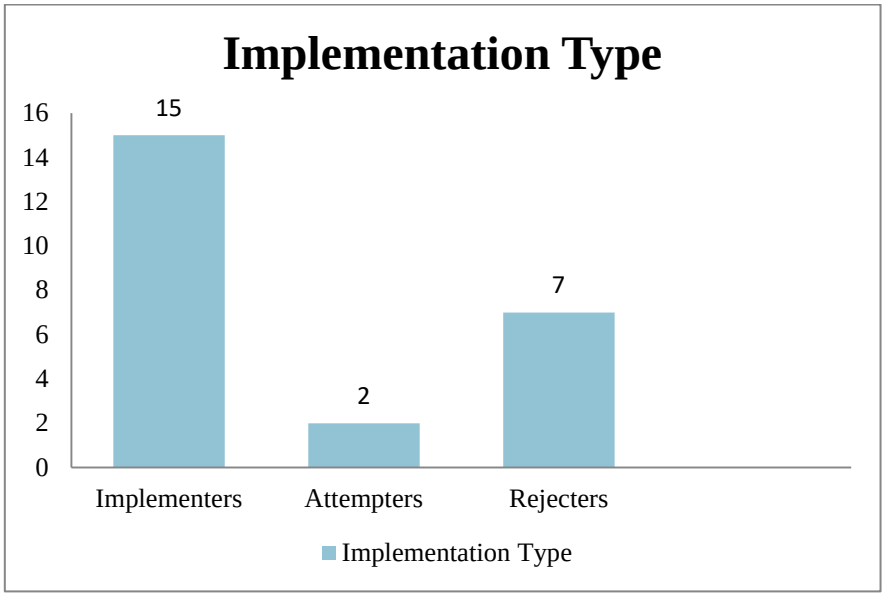
- To examine the reasons for not implementing ABC in Australian universities

Let us consider the primary data in relation to the principal questions of this research starting with the assessment of "the extent to which ABC is implemented in Australian universities". Given the fact that the decision to implement ABC or not is not quite straightforward or dichotomous, this survey used three categories initially (rather than only 2) to assess the extent of ABC implementation namely: implementers, attempters and rejecters. For the purposes of data collection and investigation in this study -

- "Implementers" are classified as institutions that are the present users of ABC;
- "Attempters" are universities that have attempted to use ABC, but felt it did not fit their needs or skill sets, and therefore continued to use options other than ABC
- "Rejecters" are universities that chose outright not to implement ABC.

The terms "Implementers" and "Attempters" were used explicitly in the survey. However, the term 'rejecters' was not used in the actual questionnaire, as highlighted in the pre-testing of the questionnaire to avoid the possibility of interpreting the term that may have caused bias or implied prejudice to the participant.

Figure 4.2: Implementation Type



The table above provides a distribution of responses in the 3 categories mentioned earlier. It indicates that out of the twenty-four respondent universities, fifteen identified themselves as "implementers" (62.5%) and confirmed that they were presently using ABC (n=15/24); two respondents indicated that they had explored the ABC initially but chose not to continue using it (8.3%); and seven universities made a decision not to implement this approach outright (n=7/24 = 29.2%). It is clear that a majority (62.5%) of Australian universities use ABC. The incidence of ABC use is significantly higher, compared to non-adopters in Australian Universities sector. This figure is significantly higher than the ABC adoption reported by Baird (2007, p. 561).

Given the small size of the 'attempter' cohort (2/24), data analysis and discussion will predominantly focus the two significantly larger categories of 'implementer' or adopters of ABC and 'rejecter' on non-adopters of ABC.

Understanding of the features and characteristics of ABC adopters and non-adopters (rejecters) is critical in appreciating the two groups of institutions. We will now unpack the aggregate data to gain further insight into the research issues. This knowledge will allow us to better understand the positions and thinking of the two distinct groups and further exploration of potential contribution of structural differences in establishing the adopters and non-adopters.

4.11 Implementers

The demographic profile of adopters indicates some interesting institutional and individual characteristics. There is not much difference in terms of level of qualifications (bachelor or masters – 8 with bachelor and 9 with masters) or gender (7 female and 10 male) of the individual respondents in this category. However, three features are worth noting in terms of age, accounting industry experience and length in current position. The implementers are slightly older (14/17 are older than 40 years) with more accounting profession experience (14/17 with more than 15 years' experience) and more experience in their current position (9/16 with more than 5 years' experience in current position). Similarly, there is not much difference in terms of institutional characteristics such as location – city versus regional base with 9 city based and 8 regional institutions. In terms of institutional size however, implementers are dominated by larges universities on both counts – number of employees and annual turnover. For example, 15 out of 17 implementers have annual turnover greater than 500 million dollars and 10 out of 17 institutions have more than 3000 employees. There is indication that implementers membership is dominated by either IRU or G8 categories (4 each – 8/11 with 6 don't know).

Having isolated the structural features of adopters, we will now analyse the data in exploring the key research questions. It is pertinent to note that implementation and adoption of ABC is characterised by four distinct and inter-related dimensions and processed that are labelled as: (1) pre- implementation trial; (2) utilisation of external professional support; (3) positive role played by the senior management of the institution and (4) training of staff.

Let us look into the pre-implementation stage and its contribution in an organisation eventually becoming an ABC adopter. Exploration of data provides interesting insights into the characteristic of these respondents particularly the implementation path adopted by them. For example, while fifteen institutions that implemented ABC and were still actively using it, only seven institutions had adopted ABC without any trial period while the remaining eight institutions adopted ABC after an evaluative trial period. The extent and scope of trail also varied. Three institutions indicated the trial evaluated ABC at all levels of organisational operations (Central costs, Department-level, School-level and per subject/unit level). One institution evaluated ABC only at department -level and individual subject/unit level.

The role and contribution of ‘external professional assistance’ has emerged as one of the key dimensions of ABC adoption journey. It seems the decision to adopt and implement ABC through a systematic trial was very largely supported and facilitated by external professionals. Both trial and implementation stages, it is evident, were significantly facilitated by professional support of external consultants. Twelve of the fifteen institutions received assistance from an external consultant/s in the

implementation of ABC, although, the levels of assistance varied between institution. As indicated by a respondent, *"it was really helpful in the very early stages of ABC implementation to have expert assistance at hand – people who know ABC. We did not have the right skills then*".

Following the systematic trial of ABC – facilitated by independent external consultant, it is also evident that most 'adopters' recognized the need for appropriate staff training and development. An important feature of ABC implementation therefore was the organizational commitment to staff training and development. Training of staff particularly from accounting and finance sections (and their equivalent organizational units of the respondents) is a significant contributing factor reported by the cohort of adopters before the full scale implementation of ABC tool.

Quality of training to both end users of ABC and accounting staff in general was reported as a relevant factor with a mean score of 3.26/5 with five institutions reporting very good success (4), nine reporting moderate success (3) and only one reporting moderate unsuccessfulness (2). Additionally, nine institutions reported that upper management strongly believed that ABC provides strong economic benefit, while four institutions reported that there will be future perceived economic benefit from using ABC. One institution reported that upper management do not perceive any economic benefit from the implementation of ABC. In one further case an institution reported that a previous attempt at adopting ABC had not been well implemented but a revised implementation had been used and this would in the future have a perceived economic benefit for upper management.

The last element of the positive implementation journey and perhaps the most significant to emerge was 'top management disposition'. Complementing the trial, external assistance and staff training, it is evident that the decision to implement benefitted very significantly from 'top management support'. As stated by a respondent, "*our implementation journey benefited from clear support from top management of the institution*". This view is also reflected by a majority of other respondents in the implementer cohort with a mean score of 3.5 / 5. Of the 15 universities presently using ABC, 3 universities (20%) indicated the ABC initiative had extremely high support from top management. Five (33.3%) had good support and another 5 (33.3%) had moderate support from top management. Two universities (13.4%) had some support and extremely low support from top management. Shields (1995) listed 'top management support' as being the second most present variables (mean=4.93 on a 7 point scale; 70%) for successful ABC implementations; the first being a 'stand-alone system' (mean=5.1on a 7 point scale) present in 72% of the respondents.

Top management support in most cases was also formalised by establishing 'project champion' (or similar title) with trial and implementation responsibilities. In all but two cases the implementers had a local owner or champion driving the implementation of ABC internally.

In addition to top management support during the trial period, it is important to note that even in post-implementation phase, there continued to be a similar level of top management support for ABC. With a total of 13 Australian universities (86.6%)

receiving some top management support, of which, 8 universities (53.3%) received good or extremely high support. Top management support in Shields' study corresponds with the results of in Australian universities.

Figure 4.3: Management Support

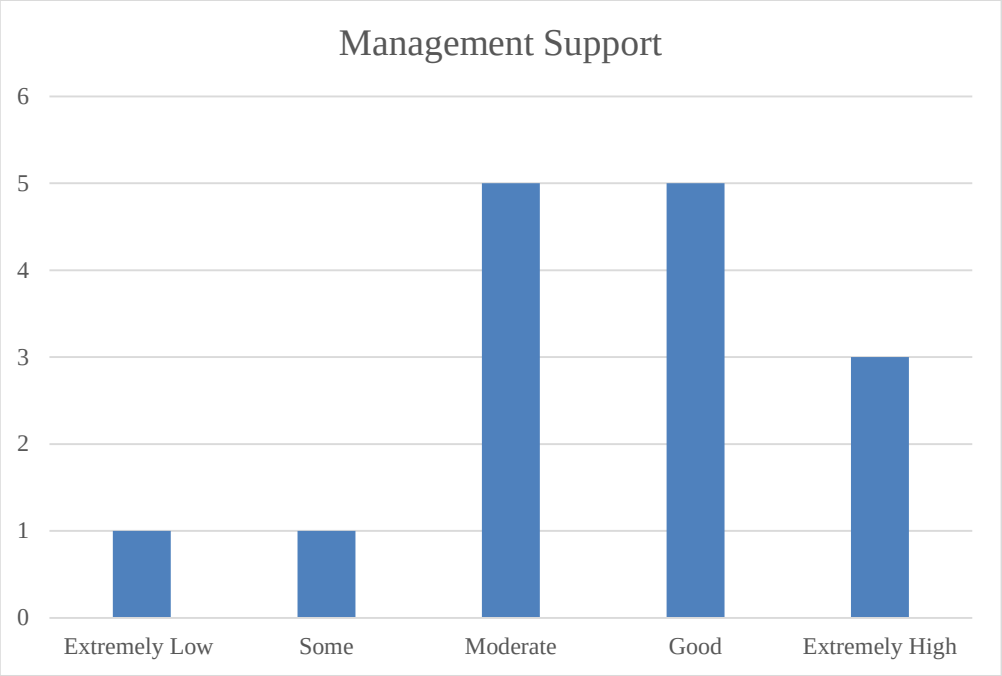
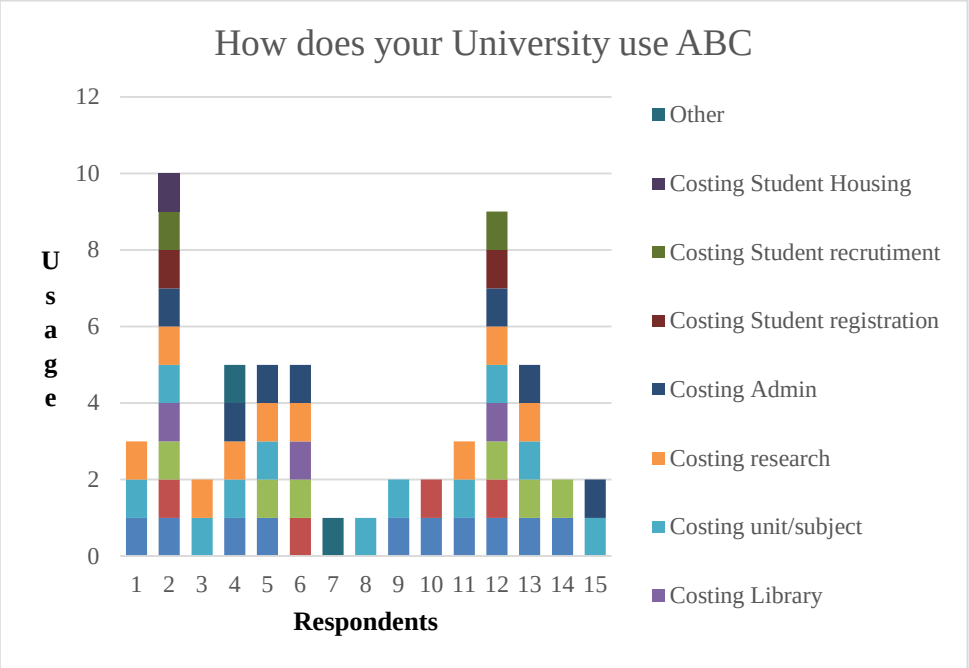


Table above provides frequencies of management support as reported by the adopters.

Figure 4.4: How the Implementer University uses ABC



While the understanding of the four distinct features of 'adoption' journey is insightful, so is the awareness of the reasons for using ABC. It is clear from the responses and subsequent interviews that most universities implemented ABC to address more than one costing objectives. This is more pronounced amongst the larger and diversified universities based on the cities. The table above indicates that 'implementers' use ABC to address multiple costing objectives. These objectives vary over a wide range of costing objectives including:

- Costing of individual units (subjects) and courses (academic programs)
- Costing of support service such as Library, IT and facilities, etc.
- Costing of research and research training activities
- Costing of administrative activities
- Costing of student recruitment and marketing activities
- Costing of student accommodation and housing

4.12 ABC and Satisfaction

It is widely acknowledged that adoption and transition to ABC is a time-consuming initiative and an exercise with significant cost implications. In this context, the respondents were also asked about their overall perception of the worthiness of the implementation and their current satisfaction with the cost of implementing ABC. This is captured through the notion of 'value of money' assessment. It is insightful to note that a clear majority (11/14) of respondents indicated that the cost of ABC is entirely justified. Nine institutions reported that it was worth the cost or somewhat worth the cost of implementing ABC. Four institutions were neutral and the remaining two indicated that it was somewhat not worth the cost.

Figure 4.5: Worth the Cost of Implementation

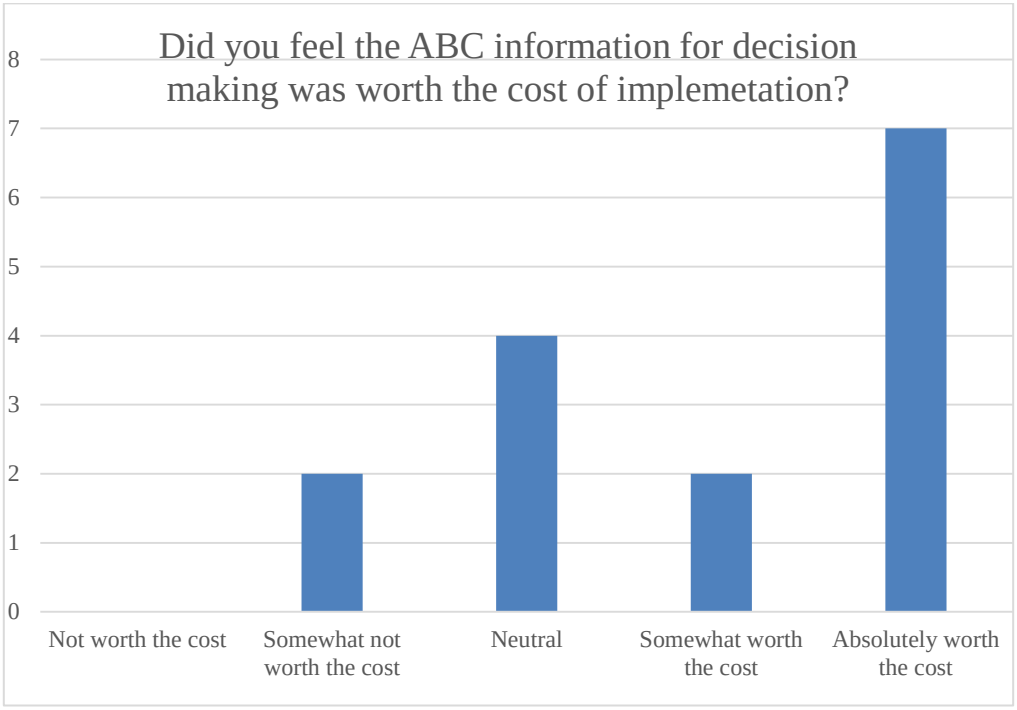


Figure 4.6: Cost and benefit of ABC

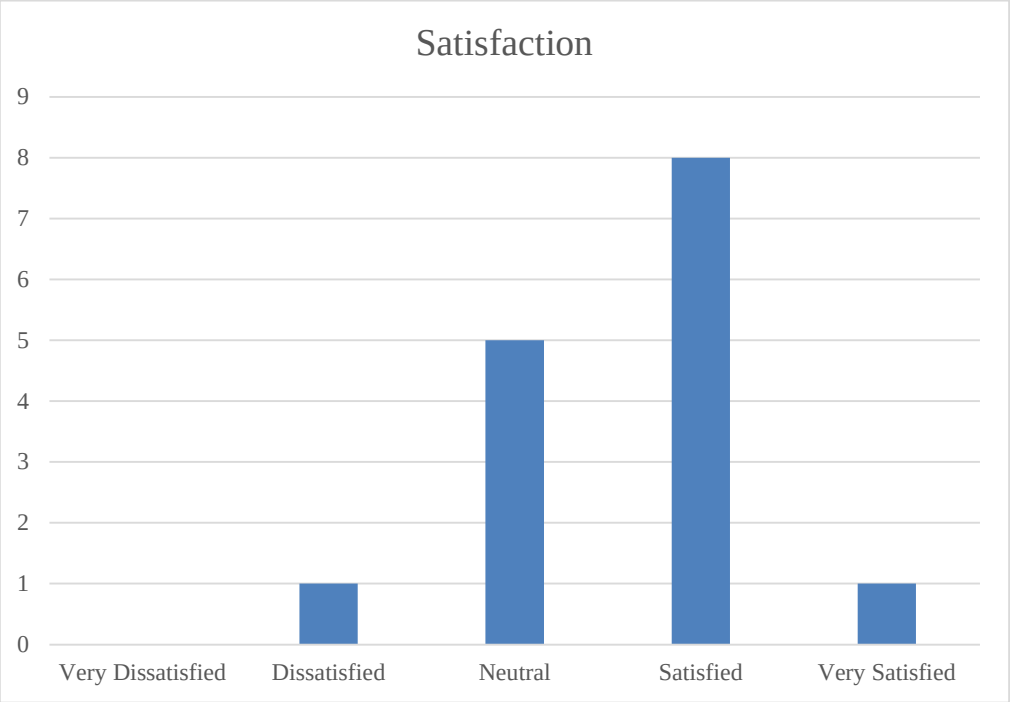


Table above highlights the overall satisfaction of respondents that are currently using ABC. Given the positive perception amongst implementers for 'value for money', coupled with the belief that ABC is useful in addressing multiple costing objectives, the overall satisfaction with ABC is quite significant. When asked about the level of satisfaction, 9/15 respondents reported 'very satisfied and satisfied' collectively. No respondents selected 'Extremely unsuccessful' or 'extremely successful.'

The next table provides a comparison of satisfaction responses in terms of university revenues. Eleven (n=11/15= 73.3%) responses for moderately and very good success was from universities with revenues greater than $501 million. Seven (n=7/15=46.7%) of the successful responses were from universities with over $700 million in annual revenues. These results indicate there is a positive correlation with

size and adoption of ABC, which is in agreement with Cagwin and Bouwman (2002), and Innes and Mitchell (1995), Bjornenak (1997) and Malmi (1999).

Table 4.9: The Value of ABC Implementation

Q15. Overall, how successful do you believe the ABC is at your university?						
Revenues in $ millions	<100	100-300	301-500	501-700	>700	Totals
Extremely Unsuccessful						0
Moderatly unsuccessful		1 6.7%		1 6.7%		2 13.3%
Moderately successful			1 6.7%	3 20.0%	4 26.7%	8 53.3%
Very good success			1 6.7%	1 6.7%	3 20.0%	5 33.3%
Extremely suscessful						0
Totals	0	1	2	5	7	15

The overall perception of the 'satisfaction and success of the implementation' of ABC is quite strong with a mean score of 3.26 on a five-point scale. This seems to be consistent with the majority view (9/14) that upper management of the implementer institutions believe that ABC offered ongoing economic benefit to them.

4.13 Reasons for adopting ABC in Australian Universities

After exploring the extent of ABC use in Australian Universities, including insight into the implementation journey, this section investigates the reasons for the adoption of ABC. While the literature has alluded to the 'efficiency argument' for opting for ABC particularly in decision-making (James & Elmezughi 2010), primary data will be analysed to understand specific reasons indicated by Australian Universities in this research.

A range of questions were presented in the survey to understand why Australian Universities decided to adopt and implement ABC as a costing tool. It is insightful to note that a large majority of the respondents (12) institutions indicated that the main motivation to use ABC was to support the need for senior executive to have better access to information for strategic decision making. This is quite specific and revealing but consistent with the strategic orientation of Australian Universities operating in a complex and unpredictable macro environment. Two respondents extended it to the specific requirements of the schools and departments as well to facilitate in assisting with their unit specific decisions. The contribution of ABC in supporting 'external reporting requirement' was also indicated as a key reason to adopt ABC.

Follow-up investigation revealed that this is particularly the case with larger universities that regularly availed external funding from sources other than State and Commonwealth agencies. As part of reporting and acquittal, many external fund providers required specific costing details and information – which according to an interviewee was better provided by ABC.

In addition to the foregoing strategic reasons, the primary data also highlighted specific reasons at operational level. At the department or unit level, the range of specific reasons vary and include a wide range such as academic and administrative issues such as profitability analysis, streamlining course curriculum; evaluation of course continuation decisions, program rationalisations and cost reduction.

The specifics of ‘cost drivers’ in terms of importance however vary significantly for the two core operational areas of the universities – (a) Academic and (b) Support departments. The key drivers for Academic departments most notably Schools of Management, and School of Accounting included the following in order to importance indicated by frequency count:

[13] Number of staff

[13] EFTSL Equivalent Full Time Student Load

[13] Space occupied

[12] Lecture teaching hours or percentage

[7] Number of subjects/units taught

[3] Library usage statistics

The ‘cost drivers’ for non-academic and support departments such as Human Resources (HR), Purchasing, Information Technology (IT), are quite distinct as listed below:

[13] Number of employees/staff

[11] Space occupied

[8] Number of students

[5] Employee hours

[3] Number of new enrolments

[1] Number of purchase orders

[1] Number of invoices processed

It is pertinent to observe that the cost drivers reported are not exclusive as some items reported for ABC also include drivers used in traditional methods, but not

necessarily in reverse. 'Number of students and staff, EFTSL and space occupied are not 'activities' but are more commonly used in traditional methods of allocating costs. Lecture teaching hours, student contact hours, library usage statistics and number of IT support calls are more related to ABC, especially when determining the costs of academic departments or the cost of individual units or classes. There is also indication that both process improvement and cost reduction are equally important reason for the use of ABC. It is interesting to note that none of the respondents have highlighted or reported reasons such as 'inaccuracies in costing' as a motive of ABC.

There is no doubt that activity-based costing (ABC) is one of the most important contemporary innovations in accounting (Bjornenak 1997). As highlighted by the findings in this section, ABC has merit to assist universities in managing competitive complexity by gaining a greater understanding of their costs. Quality information is necessary for good management in all aspects of universities operations and functions.

4.14 Reasons for not implementing ABC in Australian universities

Preceding sections have addressed and investigated two key questions of this research: Extent of ABC implementation in Australian Universities and the reasons that support its use. The following section will now explore similar issues that relate to Australian universities that currently do not use ABC. We will commence by assessing the characteristics of non-users followed by the extent of non-use. Reasons provided by non-users (termed as 'rejecters' in this research) will then be analysed.

4.15 Rejecters

As reported earlier, 7 of the 24 respondents identified themselves as ‘rejecters’ of ABC (29%). This does not include the 2 institutions that initially attempted but did not eventually implement ABC. It could be argued that the non-users of ABC are in a noticeable minority with almost two thirds of institutions currently using ABC. While a reasonable number of Australian universities are in the ‘rejecter’ category, the journey of this cohort in not adopting ABC is quite interesting and varied. Two universities (out of 24) made an initial attempt, invested some time and effort to trial the ABC system and its requirements and then formed a view not to implements. Given the small size of this group of non-adopters, qualitative views expressed in follow-up interviews will be considered simultaneously to better comprehend the thought process of this cohort.

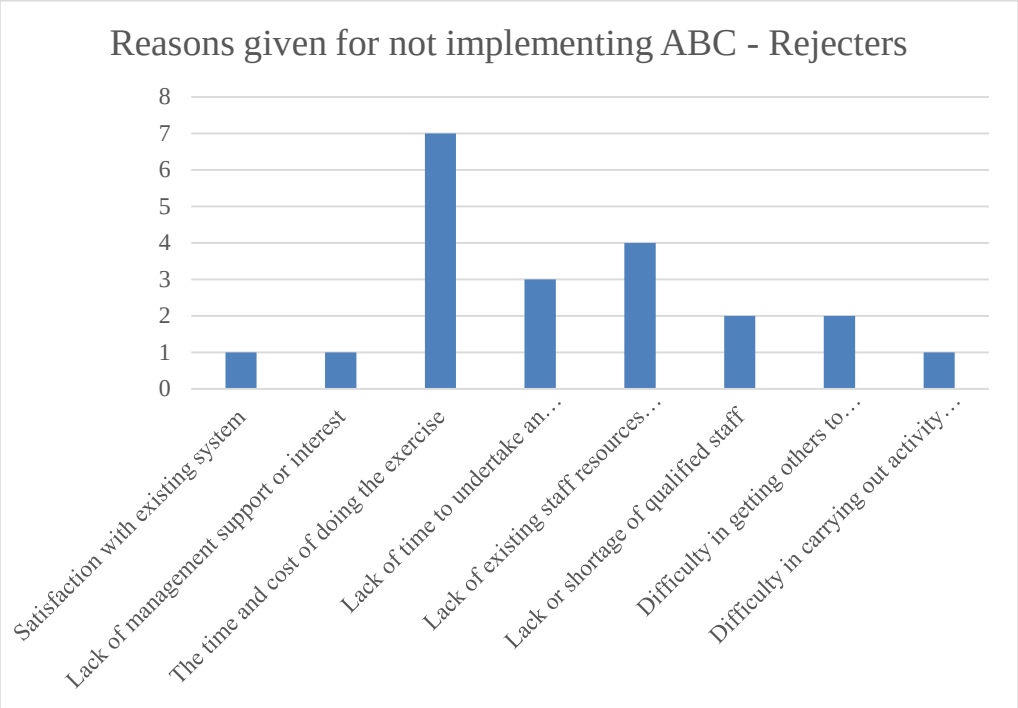
Let us commence by considering two key dimensions of this group of respondents (1) structural characteristics of the rejecter institutions and (2) demographic characteristics of individuals responding on behalf of the institutions. It is interesting to note that a large proportion (5 out of 7) institutions are city based. There are clear indications that non-users (rejecters) of ABC are smaller universities both in terms of their financial turnover (5 out of 7 with less than 500M) and number of employees (4 out of 7 with less than 3000 employees). The background of individual respondents indicates that this cohort is professionally well trained and qualified in their current positions (5 out of 7 with masters’ qualifications). Their work experience in accounting field is also noticeable with 6 out 7 respondents with more than 20 years accounting experience. However, their experience in current position in Universities

seems limited with 3 out 5 with less than 4 years' experience in present position. This is significantly different from the work experience profile of universities in the 'adopter' category.

Apart from the structural and demographic characteristics, primary data highlights two interesting dimensions of the 'rejecter' group. For example, there was a dominant view that reflected a lack of top management support coupled with indifferent attitude towards ABC as a reason of not adopting it as a costing tool. Furthermore, and quite understandably, there was no one within the 'rejecter' cohort that could be labelled as an ABC 'champion'. The lack of management support is again quite noticeably different from the support top management provided to ABC adopter universities. It is also revealing that the views of accounting professionals within these universities were also ambivalent towards ABC stated by a respondent, '*we are happy to provide costing information to senior managers in a format they want. Personally, I don't have preference'*.

The specific primary reasons as to why ABC was not implemented varied considerably as indicated in the table below. It is clear that the decision not to adopt ABC is driven by multiple factors.

Figure 4.7: Reasons for Not Implementing ABC by the Rejecters



As demonstrated in the table above, ‘time and cost’ associated with ABC implementation is reported as the dominant reason for not implementing ABC. This is followed by reasons that can be termed as ‘capacity constraints’ in terms of current staff of the university. There seems to be dominant view shared amongst this group that their staff did not have the technical capacity to deal effectively with the complexities of ABC. As stated by an interviewee, “staff limitations in a way point towards cost concerns as well”. Additionally, three institutions reported that there was a lack of time to undertake any assessment of ABC and that there was a lack of existing staff resources to implement ABC. Two institutions reported that there was a lack of qualified staff and that there was difficulty in getting others (non-finance) to understand ABC and co-operate. Further one respondent each reported some

difficulty in carrying out cost analysis activities, a lack of management support and satisfaction with the existing system respectively as reasons for non-implementation.

It is worth recording that the decision not to adopt ABC was entirely 'internally driven' with no input or consultation with external consultants as stated by 4 out of 7 respondents. None of the non-user had any external input by way of consultants at any stage of considering ABC as a costing tool. The findings of this group considered collectively are not difficult to explain or comprehend. While all rejecting respondents indicated that they were able to identify unprofitable/underperforming activities using the current costing system, their overall level of satisfaction with their current systems was low. The decision not to implement and adopt ABC therefore seems intriguing in the context of their current level of dissatisfaction. Two institutions indicated that they believe that implementing ABC in the future is a possibility. One institution found ABC useful but would not be actioning it in the near future. However, one institution did report that they were actioning the implementation of ABC in the future. In this case, the institution had performed a feasibility analysis. The remaining institutions had no plans to implement ABC.

Based on the responses and follow up interviews, two distinct features emerge: (1) a lack of top management support for ABC adoption, (2) perception of 'resource constraint'. It is argued that resource constraint or limitations perceived by the non-adopter universities is a significant driver of not adopting ABC. The dominant view of this group is that the current environmental complexity is not conducive for any

disruption, skills challenge and experimentation. This view seems contradictory and counter intuitive and difficult to comprehend in the context that most respondents in this group also accept that their current cost allocation systems (or alternative to ABC), has significant limitations and challenges.

4.16 Taking a Holistic View

Australian universities collectively constitute a critical component of Australian social-economic fabric. As predominantly publicly funded institutions, they are expected to operate in a socially responsible and prudent manner. In this context, the role and importance of accounting practices generally and cost accounting practices in particular assume a new meaning in this highly competitive market for global education. It is expected that as a services sector operator, Australian universities adopt global best practice in their strategic and operational managements. Use or otherwise of ABC should be assessed from this perspective.

Let us now consider all responses as part of the overall context starting with the historic antecedents of ABC use in Australian Universities. Primary data clearly indicated that the use of ABC in the Australian Universities is largely a recent development. Apart from 2 respondents, most users of ABC have implemented it within the last decade. Some as recently as a couple of years back. Only two universities adopted ABC more than a decade ago. For a clear majority (11 out of 14), the decision to implement has been made within last ten years. This suggests a time line around 2008 global financial crisis as a catalyst for a majority of Australian universities to review their strategic options including cost reduction and process

improvement. Financial stringency was noticeable during the GFC era and Australian Universities were not immune from its downside effects. Many universities started to experience a decline in international student enrolments adding to the financial pressure. We argue that the dominant global 'economic context' of GFC triggered many larger universities to explore all possible options including 'efficiency tools and models'. The promise of evidence-based approach to strategic decision-making offered by ABC was considered positively in the transition from traditional cost allocation tool to ABC.

Looking at the big picture, the foregoing sections confirm that while the use ABC in Australian Universities is driven by multiple reasons, justification driven by 'process improvement' and 'cost reduction' are the two dominate reasons for the use of ABC. The underlying logic of other reasons that include academic and administrative issues such as profitability analysis, streamlining course curriculum; evaluated course continuation decisions, and program rationalization, are also embedded in developing organizational capacity to deal with financial challenge emerging from the global financial crisis.

It seems that while the global financial crisis forced many universities to seriously consider ABC, the more specific expectation was to enhance strategic decision-making capabilities. As stated by an interviewee, *"our university wanted to move on to a system that could service the needs of senior executives to make timely decision based on reliable cost data"*. This sentiment was reported as the dominant

motivation of ABC implementation with 12 out of 14 respondents citing this as one of the key drivers to adopt ABC.

Collectively the primary data reported in the previous sections point to three intangible dimensions that are noticeable in Australian universities currently using ABC**. Firstly**, there is visible and overarching theme of 'senior management support' for ABC. Top management support for ABC very significantly influenced the institutional choice in favour of ABC. As mentioned by an interviewer, '*the dominant driver of ABC use was the executive management needs. Once put in place, ABC has subsequently benefited other units – (both academic and non-academic) of university processes*. The other reported decision scenarios included three aspects:

- Equitable resource allocation to schools and departments
- Restructuring of schools, departments or activities
- Identification of duplicated non-value added activities.

It is interesting to note that none of the university has directly highlighted or reported reasons such as 'costing inaccuracy' highlighted in the literature.

The **second** common factor of implementers was their commitment to ABC staff training. Training in design, implementation and use of ABC has been an important way to integrate ABC among strategy, performance evaluation, and compensation and ABC objectives. The pre-implementation training provided a mechanism for

employees to understand and accept ABC as well as to feel comfortable with it. Since ABC information was intended to be used by a variety of employees for analysis and action, such training was also a good method for creating ownership.

Training has been typically used in different areas prior to an ABC implementation. Training on how to implement assists employees in interconnecting with ABC procedures and in understanding ABC (Shields 1995). Through a better understanding, employees gain acceptance and ownership of ABC (Ibid). Training and understanding ABC applies to both accounting and non-accounting staff. Top management support affects positively on higher non-accounting ownership and support of ABC (Shields 1995, p. 150).

The **third** common factor of implementers related to the existence of 'product champion'. Thirteen (n=13: 86.7%) of the Australian universities that currently use ABC responded that they had formal or informal internal ABC "owner" or "champion" to lead, motivate, and support the implementation and development. Interestingly there appears to be a correlation with university size. Eleven (n=11) of the universities had revenues of greater than $501 million. Two (n=2) universities had revenues in the $301-500 million range. One university with revenues in the range of $100-300 million and one university in the greater than $700 million did not have an ABC owner or Champion.

Table 4.10: Informal or Formal ABC 'Champion'

22) Is there a formal or informal internal ABC "owner" or "champion" to lead, motivate, and support the implementation and development?*						
Revenues in $ millions	<100	100-300	301-500	501-700	>700	Totals
Yes			2 13.3%	5 33.3%	6 40.0%	13 86.7%
No		1 6.7%			1 6.7%	2 13.3%
Totals	0	1	2	5	7	15

To conclude this section, consistent with the contemporary economic and political reality, this study argues that when thinking about ABC adoption, it is entirely appropriate to consider organisational resources and complexity. Complex organisations would likely have much higher indirect and support costs (overhead) because of their more diverse product mix and complex processes (Cooper & Kaplan 1999, p. 20), and therefore more likely to adopt ABC.

The research findings provide valuable insights into understanding the strategic role of senior management in facilitating the transition from a traditional approach to more robust ABC. When viewed collectively, these findings provide a strategic vision and a dynamic description for non-users to embrace ABC. Furthermore, with some caution, the findings discussed could be extrapolated to the entire higher education sector of Australia.

4.17 Discussion

This section examines the research findings reported earlier, within the context of the relevant literature relating to ABC. As stated previously, there is now a well-established tradition of ABC research. Both domestic and international ABC

adoption researchers have examined a wide range of questions in services and manufacturing sectors (Cropper & Drury 1996). However, ABC adoption and implementation has not been examined in the Australian Universities context. As a result, this study fills in a gap in the literature by identifying and examining the drives of ABC adoption in this unique context i.e., higher education sector in Australia. At the same time this research also explored the barriers that either prevent or inhibit Australian Universities to incorporate ABC as a tool of cost allocation.

It is significant to acknowledge the quality of primary data. The considerable qualitative and quantitative data provided a worthwhile context to examine the ABC adoption and barriers. By investigating the experiences of senior executive of responding universities from diverse demographic backgrounds, the researcher was able to acquire in-depth information about the factor that either facilitated or prevented ABC adoption.

The overall response rate of more than 60% is reassuring and a significant improvement on similar studies conducted overseas. However, as there is no history of previous empirical research investigating the research questions in the context of Australian Universities, the results of a study such as this must be interpreted with caution.

4.18 ABC Diffusion

The extent to ABC diffusion is inadequately explored globally. As a result, there are few benchmarks available to make any meaningful comparisons. While the primary data of this research suggests a sizeable diffusion within Australian Universities of more than 60%, it is still a long way of demonstrating complete acceptance by the sector.

Activity Based Costing (ABC) is a recent innovation. The traditional methods have been widely used in management accounting for over 100 years. Limitations of the traditional methods led to a realization that there was much scope for improvement and sophistication. After considerable effort, Activity-based costing (ABC) was introduced in 1988 by Cooper and Kaplan to provide management with more precise information needed for appropriate decision-making (Appah 2013).

It is widely accepted that traditional methods do not provide management with accurate cost allocation information, particularly in organizations that manufacture in multiple product lines. In a traditional configuration, all overhead costs are accumulated in a single overhead pool (Brown, Myring & Gard 1999). Traditional methods apply the indirect costs and overhead using limited 'drivers' such as direct labour hours (or labour cost), machine hours or number of products produced (Ellis-Newman 2003). This approach of cost allocation is misleading and may be over or under applied. Furthermore, in recent times, overhead costs have increased exponentially in relation to decreasing labour costs and increased machination (Johnson & Kaplan 1987).

The implications of cost distortion are quite serious as they can contribute to pricing goods or services at less than their actual costs or with unacceptably low margins (Simmons, Wright & Jones 2006). Such distortions can apply to almost all sector including governmental and non-profit organisation's services and products. If an organisation under values the costs of its services, the implications can be concerning. For example, viable option of outsourcing these services can be overlooked. Similarly, services could be selected for outsourcing improperly [incorrectly] if the organisation over values the costs of the service.

In discussing the slow rate of ABC diffusion globally, Rogers (2003) contends that often the complexity of new tools or systems can hinder its rapid and widespread adoption. ABC focuses on the 'activities' that generate the costs and not simply on the financial information related to business transaction that add to the perceived complexity (Manalo & Valenzuela-Manalo 2010). As Moore (2000, p. iv) explains, ABC is a methodology used to measure "costs and performance of activities, resources used, and costs 'objects' such as products or services." ABC allows management to identify inefficient or avoidable activities and opportunities for cost reduction or production efficiency (Moore 2000, p. 4).

Coming with the strong features and credentials to overcome the limitations of the traditional cost allocation methods, one could reasonably assume the potential of widespread use of ABC. One could be forgiven to accept that organizations would embrace ABC with open arms. Overall, the facts available through the literature and also this research however tell a different story. For organisations that produce a small number of unique items, traditional methods are as effective today as they

were 100 years ago. The simplicity of the traditional cost system makes it so appealing to managers (Brown, Myring & Gard 1999).

While limited data currently exists about the overall adoption of ABC, given the challenges and complexity, ABC application has not made huge inroads. The findings of this research in this backdrop provide a somewhat unexpected result. However, on closer examination of the structural characteristics of this section, it can be understood. Three features justify the higher level of ABC diffusion in Australian universities: (a) professional workforce of knowledge based institutions (b) intensity of global competition and (c) operational complexity of universities. As canters of academic excellence, universities are often at the forefront of knowledge creation and dissemination and more likely to adopt the new tools such as ABC.

4.19 Why ABC

Previous studies and literature that explore the reasons for ABC adoption is growing. It is generally accepted that the traditional methods have been widely used in management accounting for over 100 years and their limitations have led to the development of more contemporary techniques. In this context, activity-based costing (ABC) was introduced in 1988 by Cooper and Kaplan. The primary justification lies in the capacity of ABC to provide precise information for organizational decision-making. There is growing consensus that “ABC is a method for allocating cost in a much more efficient and accurate way than that of a traditional costing system” (James & Elmezughi 2010, p. 56). The main advantage of

ABC is that it minimises or avoids distortions on product costs that might occur from arbitrary allocation of overhead costs (Edwards 2008).

In this sense, findings of this research are corroborated by the literature. These findings have reinforced some of the factors that the literature suggested in better understanding the reasons for ABC adoption or otherwise. However, these findings also provided a new perspective and context to the decision-making argument. The primary data points only to 'strategic decision making' only as a key driver of ABC adoption in Australian Universities.

The continued reduction of university funding from the Commonwealth, which many argue will continue in the foreseeable future, has forced Australian Universities to be more strategic in their planning and implementation. Managers of today view the accuracy of cost information as one of the most important challenges (Raz & Elnathan 1999; James & Elmezughi 2010). With enhanced competition between Australian universities for both domestic and international students in both higher education and vocational programs, university management now relies on quality financial and non-financial information as a foundation of effective decision-making.

Australian Universities are not alone in this predicament. Universities worldwide constantly balance ever-changing funding resources and the differential costs of their programs (Simons, Wright & Jones 2006). They also need to have a distinct understanding of the influence of the reasons or cause factors of these costs (Goebel,

Marshall & Locander 1998, Brown, Myring & Gard 1999; Henderson & Brown 2001; Edwards 2008) as to where their limited resources are best invested to achieve their desired goals and outcomes.

The decisions of Universities that have adopted ABC and the reasons of ABC implementation is supported by the arguments put forward by Scott (1987, p. 48). He observed that rational systems are designed within organisations for the efficient and effective realisation of achieving and completing goals and tasks. Institutional theory acknowledges the constancy of "rule-based" behaviours, including the recognition that these rules and behaviours can change with the changed context (Burns & Scapens 2000).

As centres of knowledge and research, Australian Universities are an example of creating and sustaining 'rational systems' that are designed for the efficient and effective realization of achieving and completing goals and tasks (Scott 1987). If ABC is a truly value creating cost accounting tool, it is argued that its diffusion within the sector will continue to grow and will eventually cover all universities. The specific path to this outcome however is difficult to predict. Two approached suggest some promise: *normative isomorphism* and *mimetic isomorphism* (DiMaggio & Powell 1983). The normative pressures can influence professional procedures, which affect how things are done in the workplace. Alternatively the structural changes in organisations that are largely motivated by the desire to be more similar to other organisations--*mimetic isomorphism* may contribute to ABC adoption. Mimetic processes in organisations are changes to the operational models by imitating or

adopting the process of other organisations. Sometimes this is done unintentionally, indirectly through employee "transfer or turnover" from similar organisations. This allows organisations to adopt new policies and procedures and incorporate them into their operational systems (Meyer & Rowan 1977).

Institutional researcher Scott (1987) argued that two primary types of actors shape modern institutions: the state and professional bodies. These two factors influence the actions of institutional "patterns and mechanisms." Findings of this research certainly provide some support for the role of 'state' in shaping the governance system of a large number of Australian Universities. All Australian Universities view the funding posture of the current Morrison Government as rather restrictive. In this environment, most universities are continuously exploring options to maintain market share. While it would appear difficult to term ABC adoption as an indicator of what DiMaggio and Powell (1983) describe as 'coercive isomorphism' arising from the political influences of the government, qualitative observations by some respondents however indicate some support. It is important to note that professional accounting bodies operating in Australia do not provide any prescription, indicate preference, or endorse ABC as a preferred tool of cost allocation.

4.20 Why Not ABC

Let us now unwrap the primary data of non-adoption of ABC in the context of available literature. The factors that inhibit ABC adoption are perhaps best captured in the observation of Brown, Myring & Gard (1999, p. 19) that, "*ABC implementations are not for the faint of heart'*. This and similar comments essentially highlight the essence of the perceived barriers to ABC adoption.

A wide range of reasons for not adopting ABC is reported in the literature. Some of the more common ones are listed below (Pavlatos & Paggios 2009, 517):

- satisfaction with the existing cost accounting system (Brown, Myring & Gard 1999; Pavlatos & Paggios 2009),
- high perceived cost of initial ABC implementation (Simmons, Wright & Jones 2006),
- lack of adequate training about ABC implementation (Shields 1995),
- lack of time to access ABC suitability to their company.

Anderson (1995) argued that ABC often takes a considerable amount of time to implement and often requires multiple iterations to produce required information. ABC requires knowledgeable and well trained staff to implement and maintain, which is one of reasons that outside consultants are often necessary in the initial stages for successful implementations (Brown, Myring & Gard 1999). Findings of this study are broadly consistent with these comments and observations. In addition, the institutional perception of 'resource constraint' also emerged as a significant barrier that inhibits Australian Universities and their adoption of ABC.

Cost associated with the implementation as a dominant reason for not adopting ABC is worth exploring further. Two themes are dominant in this investigation: the belief that the cost associated with the implementation is either (a) unaffordable or (b) unjustified. Delving further into this line of reason suggest that it may be a misplaced perception of non-users. A review of the cost of ABC as a software for example indicates that there is a wide price range for different variants of ABC. However, none could be termed as exorbitant and therefore a justification of non-adoption. In-

depth interviews revealed that respondents were far more concerned about the inconvenience and cost of the 'disruption' particularly during the transition period. They were also mindful of the cost associated with training of relevant staff. In the context of multi-million dollar yearly turnovers, the cost argument does not provide a convincing justification for not adopting ABC.

We argue that the cost driven argument needs to be considered more carefully. Broadly, there are three key components of ABC adoption (a) cost of the ABC software and (b) training cost and (c) cost associated with the disruption during the transition period. Qualitative responses indicated that there was limited understanding and appreciation of the components listed earlier and their specific costs. It is obvious that the belief that ABC software is always customized and tailor made and therefore excessively expensive is far removed from reality. As stated earlier, there are various software packages that can be used to aid in using ABC. Some of the larger enterprise software systems have modules that are designed specifically for ABC. The list of off-the-shelf software packages included: Excel, ImpactECS, Oracle/PeopleSoft ABM, SAP and SAS. The most frequently used ABC software is Excel.

The simplicity of the traditional cost system on the other hand continues to be appealing to many managers (Brown, Myring & Gard 1999) including the Australian Universities. Traditional cost methods are viewed as sensible for gathering and assembling costs but not for converting, the costs collected into accurate managerial information (Swenson 1995; Gunasekaran, Williams & McGaughey 2005;

Simmons, Wright & Jones 2006; Ismail 2010). As cited in Velmurugan (2010, p. 7), McKenzie (1999) stated that traditional costing techniques are not complicated to understand and easy to employ – plausible justification to maintain the 'status quo'.

4.21 Summary

In view of the encouraging participation of Australian Universities and in particular the robust characteristics of individual respondents (on behalf of the universities), we are inclined to argue that the findings of this research can be extended, with caution, to the entire higher education sector comprising of all of thirty-nine universities operating in Australia.

Based on the review of the university operations, particularly in terms of the number of courses offered, diversity of course disciplines covered, teaching mode and target student populations, we contend that accounting reporting requirements of these institutions at the broad level are fairly similar – a view also confirmed by two respondents. As recipients of additional funds and grants from various state and federal agencies, the reporting requirements may change but not in a significant manner. With shared structural characteristics of the respondents with experience from multiple Australian universities, we argue that the practices in terms of 'cost allocation' approaches will eventually converge and the entire sector will use ABC as a cost allocation tool.

There is general acknowledgement that even though the ABC was initially created for the manufacturing sector, it can be applied equally well in the services sector. ABC has been used in a wide range of industries including: hospitality and tourism

(Appah, E & Binaebi, B 2013; Ferreira, Moulang & Hendro 2010; Guilding, Pavlatos & Paggios 2009; Pellinen, J 2003), the insurance industry (Delpachitra, S 2008), customer profitability (Cokins 2015), transport and construction (Ferreira, Moulang & Hendro 2010), supply chain management (Anderson & Dekker 2009; Roodhooft & Konings 1997), hospitals (Appah & Binaebi 2013; Pizzini 2006), public sector (Arnaboldi & Lapsley 2003; Baird 2007; Brown, Myring & Gard 1999) financial services (Ooi & Soh 2003; Hussain & Gunasekaran 2001; Innes, J, Mitchell, F & Sinclair, D 2000) and more. We argue that ABC will continue to have much wider application in all types of organisations, sectors and industries.

The list of potential application of ABC is significant in scope (Pavlatos & Paggios,2009, p. 516) including functions such as: better understanding of costs; budgeting; cost modelling; customer profitability analysis; customer service; output decisions; outsourcing decisions; new product or service design, make or buy decision; product mix decision and supply chain management. The qualitative responses listed below provide further indication of the expectations of future functional capabilities of ABC:

- *'It should assist as a Predictive Modelling tool'*
- *'It should allow for benchmarking to see where we are positioned against other similar universities with regards to our costs is important'*
- *'It should assist with external reporting requirements based on distinct market segments'*

It is prudent also to conclude that the use of ABC amongst Australian universities is high and will continue to increase.

* * * * *

Chapter 5

CONCLUSION

5.1 Introduction

The objective of this chapter is to bring the dissertation to conclusion. After providing an overview of the findings, it will address the standard issues such as the areas of further research; limitations of the study and contribution of this research. To recap, this research was undertaken from the institutional perspective. The study assessed the extent of ABC diffusion in Australian Universities. It also investigated the motives or drivers that supported the adoption of ABC by exploring the views of Australian Universities. The study assessed the views expressed to determine any barriers that either prevented or inhibited individual institutions to actively decide against the suitability of ABC and not adopt ABC. The study relied on qualitative and quantitative data sources that provided findings that are mostly consistent with the literature. Some valuable new insights are also reported by Australian Universities.

The chapter commences by re-visiting the aim of the study and the approach undertaken to fulfil the purpose of the research. This is followed by an overview of the research findings which speak to the study's research questions. The chapter concludes by providing recommendations for further research which may increase the likelihood of ABC adoption in Australian universities and perhaps more widely in the services sector of Australian economy.

5.2 Aim of the study and the approach taken

As articulated in Chapter 3, the aim of this study is to address three key issues about ABC as it relates to the Australian Universities: assessing the extent of ABC adoption; motives of ABC adoption and barriers that inhibit ABC adoption. This is the first comprehensive attempt to investigate the diffusion of ABC in the higher education sector in Australia. After careful consideration and review of literature, it was decided that a prudent research approach will be to embark on this journey by seeking answers to the fundamental and basic questions rather than framing complex research questions that would most likely lack credence as there is currently no historic context to provide any guidance. This aim was fulfilled through a systematic approach and measured work to answer the research questions.

The research questions are:

- To determine the extent of ABC implementation in Australian universities
- To examine the reasons for the implementation of ABC in Australian Universities
- To examine the reasons for not implementing ABC in Australian universities

To meet the aim of the study and answer the research questions a sequential exploratory mixed method research design was deemed appropriate and therefore operationalized. All publicly funded Australian Universities were included in the population of interest. A pre-tested questionnaire was emailed to all Universities with appropriate follow up at pre-determined time intervals. In-depth interviews followed with a small number of respondents to fully comprehend the responses.

5.3 The key findings

The summary of findings listed below is based on a response rate of more than 60% represented by 24 universities from all states and territories in Australia. As highlighted earlier, the higher education sector in Australia is unique in many ways. The 39 Australian public universities are geographically dispersed in all states and territories including the Northern Territory (NT) and Australian Capital Territory (ACT) of Australia. There is however a greater concentration of universities in the larger states such as New South Wales (NSW), Victoria and Queensland. While most universities operate from a single location in Australia, there are some universities with operations at multiple campuses including multi-site domestic delivery of courses and activities at off-shore locations. Almost all universities offer courses in both 'internal' and 'external' modes. Similarly, almost all universities have targeted both domestic and international students. The diversity of student and courses collectively indicate significant operational complexity in this sector. Some of the key findings of this research are:

- The incidence of ABC use is significantly higher (62%), compared to non-adopters in Australian Universities sector.
- There is not much difference in terms of institutional characteristics such as location – city versus regional base with 9 cities based and 8 regional institutions that currently use ABC.
- In terms of institutional size however, ABC implementers are dominated by larger universities on both counts – number of employees and annual turnover.
- The implementing institutions are members of either IRU or G8 categories.

- The journey of ABC adoption and subsequent implementation was through a systematic trial of ABC that was largely supported and facilitated by external professionals.
- Organizational commitment to staff training and development particularly for accounting and finance sections is a significant contributing factor of successful ABC adoption.
- ABC adoption and implementation benefits from 'top management support' during both the trial period and post-implementation.
- Most universities implemented ABC to address more than one costing objectives.
- The main motivation to adopt ABC was to support the need of senior executive to have better access to information for strategic decision-making.
- The non-users (rejecters) of ABC are smaller universities both in terms of their financial turnover and number of employees.
- There was a dominant view amongst the non-users of ABC that reflected a lack of top management support coupled with indifferent attitude of accounting professionals towards ABC as a costing tool.
- 'Time and cost' associated with ABC implementation is reported as the dominant reason for not implementing ABC.

5.4 Significance and Contributions

ABC has been researched globally for more than 30 years in different industries and organisational contexts. ABC related research in the higher education sector is rather new. Cropper and Cook (2000) for example investigated ABC in British universities

and reported high level of dissatisfaction. By the turn of this century, more studies in ABC related to universities were published (Henderson & Brown 2001; Kinsella 2002; Mensah & Werner 2003; Lewis & Styles 2004; Reich & Abraham 2006). However, the research topics covered were limited in scope and included: the applications of ABC in university libraries (Ellis-Newman & Robinson 1998; Reich & Abraham 2006; Pernot, Roodhooft & Van den Abbeele 2007; Kont 2011); and management of academic programs (Whelan 2003) etc. Overall, ABC research in the Australian university sector is rather limited.

Given this background and context of limited ABC research in the higher education sector of Australia, this research makes a significant contribution to our understanding by exploring some of the fundamental issues of ABC diffusion, the key drivers and the barriers perceived by the users and non-users in Australia.

While the findings are consistent with the mainstream literature, they provide deep insight and perspective on the adoption journey and the role of senior management of the institution. It is insightful to note that the notion of 'efficiency' as alluded to in the literature is replaced by 'decision making effectiveness' at strategic level, according to the findings.

Findings of this research are also significant as they unravel a new chapter in our understanding of ABC globally. Commencing the research by investigating the fundamental issues of ABC adoption, its motivators and perceived impediments, this research has laid the foundation to exploring other aspects such as the role of

professional bodies, staff training and awareness and cross sector sharing of ideas. Findings of this research will be of assistance to other sectors that are dependent on Commonwealth Government funding to assess and refine their governance practices in these times of financial constraint imposed by the Commonwealth Government – a key source of university funding in Australia.

5.5 Implications of the findings

The findings have the potential to contribute to driving much needed changes to management accounting tools and practices and to facilitate effective decision-making at all levels of university management. While the key driver of ABC adoption is top management, the reality is that every cost centre will extract significant benefit from realistic cost allocation tool. As a result, this research and its findings have far-reaching implications in a number of ways:

(a) Accounting professional bodies such as CPA Australia and CA Australia need to take a closer look at facilitating the profession to transition from traditional tool to ABC.

(b) There is a need to introduce training programs to facilitate the transition of ABC non-users to be proactive in embracing ABC as a cost-effective cost allocation tool,

(c) The findings also indicate a need to update accounting curricula to provide knowledge and skills on proper application of ABC. This change has the potential to prepare an ABC ready workforce and lift the decision-making effectiveness of all sectors.

The research findings from this study will also be useful for policy makers interested in decision-making effectiveness in all types of institutions of higher learning. The results revealed that if Australian Universities are to compete in these times of economic stringency and global competition for international students, they should have the right tools which support and encourage true cost allocation.

5.6 Limitations of the research

While the study has successfully investigated the research question and the results from the study are promising, there are limitations with this study that may call for caution. While the findings are important, they do not present a full account of the results, as the actual findings are more complex. As stated earlier, almost a third of respondents did not participate in this study.

We therefore need to exercise caution extending these findings to the entire sector in Australia. For example, we should be prudent in making any bold prediction about the status of the 13 universities that did not respond, either as users or non-users of ABC. Equally, care should be exercised to make generalisation to cover the entire higher education sector in Australia.

The limitation of response also created constraints in the application of statistical analysis. Similarly, the participants in the qualitative phase were self-selecting and chose to contribute to the study in a voluntary capacity. Thus, they may not have been fully representative of the population from a demographic diverse background to represent the overall views of the sector. Consequently, it is possible that other

findings may have emerged if the research has access to a larger and representative group of respondents.

5.7 Recommendations for further research

Findings of the study confirm that the study objectives have been addressed adequately. We now have a better understanding of ABC adoption or otherwise in Australian Universities. While the findings are aligned with the literature and in itself an important discovery, it is unwise to claim that further investigation is unwarranted. There is a need for further exploration of the findings. Some limitations of the study have been identified which opens up new areas of study for future ABC researchers. The following are recommendations for improvements on the scope of this study:

- Findings of this study provide a strong indication of satisfaction by universities that have adopted ABC. The next line of research investigation should explore this issue by exploring if there is significant performance indicators of ABC compared to non-users of ABC. There are multiple methodological options: pre and post-performance analysis using case study; or analysis of standard performance indicators such as market share, cost per student, growth etc.
- Normative pressures from professional bodies influence organizations in quite noticeable ways particularly in terms of educational and training requirements to be members of professional organizations (DiMaggio & Powell 1987). It will be helpful to investigate this matter as accounting

professional bodies in Australia continue to play a key role in fostering the profession.

- The small population size of the sector precludes the application of higher order statistical tools. Future research could consider adopting different research methodologies to achieve a deeper understanding of how to successfully adopt ABC in demographically diverse Australian Universities. This may include undertaking an in-depth case study methodology. The results of the case study may provide a road map on how to successfully achieve ABC diffusion in public funded universities.
- The notion of 'responsive adoptive organism' coined by one of the earlier institutional theorists - Selznic (1957) suggested that the coping mechanisms of Australian Universities should be similar if the conditions faced by all universities are similar in terms of resource access, competition and regulation. With this in mind, the decision of many not to adopt ABC is difficult to explain and needs further investigations.

It is anticipated that by gaining a deeper understanding of the root causes highlighted by non-users, these organisational barriers to ABC adoption could be remedied. Ameliorating these barriers would afford universities of diverse backgrounds, particularly the smaller universities to adopt ABC as a tool of effective governance.

In conclusion of this section and the thesis, it is essential to acknowledge the importance of universities to Australian society. Universities are important to the prosperity of Australia through their contribution to human and social capital (Deloitte 2015). Technological progress and economic growth are powered by

research conducted to a significant level at and in collaboration with Australian Universities. Universities contribute to the leadership and development of an educated and more productive workforce as employees and as future entrepreneurs.

As a concluding statement, it needs to be recognised that activity-based costing (ABC) is one of the most important contemporary innovations in accounting (Bjornenak 1997; Cropper & Crook 2000). It has enormous merit to assist universities in gaining a greater understanding of their costs. As the Gurus of Management have stated, quality information is necessary for good management; if you cannot measure it; you cannot manage it (attributed to both Peter Drucker & W. Edwards Deming).

* * * * *

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AGO--Australian Government Attorney General's Office

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APPENDIX A: Demographic and Classification questions to all respondents

Activity-based Costing Survey

Part One

Copy of

Activity-based Costing (ABC) in Australian Universities

This project seeks to understand and explore the diffusion of activity-based costing in Australian universities. You have been selected for participating in this national survey because you have knowledge of the use of activity-based costing (ABC). There are only a small number of participants selected to provide information about ABC in Australian universities and your feedback counts. The survey is anonymous and should take about 10-15 minutes to complete. Once you have clicked the link to submit the survey you will not be able to retrieve your data as it will be submitted as de-identified responses. No personal details will be collected or included in any reports or papers produced. Once you have submitted your responses you will be asked in a separate link if you wish to volunteer to participate in an individual interview about this project. You are not obligated to volunteer or participate in the interviews. Some important details you need to take note of:

- Participation is voluntary; therefore you are not obliged to participate.
- By pressing the "submit" button at the end of the online survey you are giving your informed consent to participate in the research.
- Please download the attached document here, read and keep this document for future reference. After viewing the document, click on the back button (left arrow) to return to the survey.

Please click "Next" to begin the survey. Thank you for your time and effort.

Part Two

1) What is your current age?*

( ) 19-29 years old

( ) 30-39 years old

( ) 40-49 years old

( ) 50-59 years old

( ) 60-69 years old

( ) 70 years old and over

2) What is your Gender?*

( ) Female

( ) Male

( ) X (indeterminate/intersex/unspecified)

3) What is your highest level of education achieved?*

( ) Less than high school

( ) Graduated high school

( ) Trade/technical school

( ) Some college, no degree

( ) Associate degree

( ) Bachelor's degree

( ) Advanced degree (Master's, Ph.D., M.D.)

( ) I choose not to disclose

4) How many years have you worked in the accounting profession?*

( ) 5 year or less

( ) 6-9 years

( ) 10-14 years

( ) 15-19 years

( ) 20 years or more

5) What is your current position title?*

---

6) How many years have you worked in your current position?*

( ) Less than 1 year

( ) 1-2 years

( ) 3-4 years

( ) 5-10 years

( ) More than 10 years

7) In what other industry was your previous experience?*

( ) None

( ) Other - Write In (Required):
_____*

8) If yes, in what industry? Check all that apply.

[ ] Manufacturing

[ ] Service

[ ] Education

[ ] Wholesale/retail

[ ] Other - Write In (Required):
_____*

9) What are the approximate total annual revenues reported on your university's most recent annual report?*

( ) Under $100 million

( ) $100-300 million

( ) $301-500 million

( ) $501-700 million

( ) over $700 million

10) What is the approximate number of employees at your university?*

( ) Less than 1000

( ) 1000-2000

( ) 2001-3000

( ) 3001-4000

( ) 4001-5000

( ) more than 5000

11) Is your university a city based university or regional university?*

( ) City based

( ) Regional university

12) Is your university a member of:

( ) Group of 8 (Go8)

( ) Australian Technology Network (ATN)

( ) Innovative Research Universities (IRU)

( ) Regional Universities Network

( ) Australian New Generation Universities (NGU)

13) Has your university attempted to, or implemented ABC?*

( ) Yes

( ) No, we reviewed the use of ABC, but made no attempts to actually use (implement) it. We chose not to investigate it further.

( ) No, we have not considered ABC methodology at this time

14) Does your university presently utilise activity-based costing?*

( ) Yes

( ) No

Part 3 Implementers

15) Overall, how successful do you believe the ABC is at your university? *

( ) Extremely unsuccessful

( ) Moderately unsuccessful

( ) Moderately successful

( ) Very Good Success

( ) Extremely Successful

16) Does management (at the department/school or executive level) perceive an economic benefit from the data collected from ABC now or in the future?*

( ) Yes, presently

( ) Yes, in the near future

( ) No

( ) Other - Write In (Required):
_____*

17) Did your university implement a pilot (trial testing) program before a more robust implementation of ABC?*

( ) Yes

( ) No

18) How did you use ABC in your trial testing? (check all that apply)*

[ ] Allocate central costs to schools and departments

[ ] Costing Schools (School of Business, School of Engineering, etc.)

[ ] Costing Departments (IT, HR, Purchasing, maintenance, etc.)

[ ] Costing subjects/units (Math101, Eco402, etc.)

[ ] Other - Write In (Required):
_____*

[ ] Not applicable

19) To what degree is the ABC initiative supported by top management at your university?*

( ) Extremely low support

( ) Some support

( ) Moderate support

( ) Good support

( ) Extremely high support

20) Was upper management clear and concise about the objectives when the ABC initiative began?*

( ) Unclear

( ) Somewhat clear

( ) Moderately clear

( ) Good clarity

( ) Extremely clear

21) How would you rate the amount of *training* provided to employees concerning the *implementation* of ABC at your university? *

( ) Very dissatisfied

( ) Dissatisfied

( ) Neutral

( ) Satisfied

( ) Extremely satisfied

22) How would you rate the amount of *training* provided to employees concerning *the use of* ABC at your university?*

( ) Very Dissatisfied

( ) Dissatisfied

( ) Neutral

( ) Satisfied

( ) Extremely Satisfied

23) Is there a formal or informal internal ABC "owner" or "champion" to lead, motivate, and support the implementation and development?*

( ) Yes

( ) No

( ) Other - Write In (Required):
_____*

24) To what extent is an off-the-shelf packaged ABC software program used in your university? *

( ) Not used

( ) Slightly used

( ) Somewhat used

( ) Significant use

( ) Very high use

25) What was the primary off-the-shelf packaged software is being used? (check all that apply)*

[ ] Excel

[ ] ImpactECS

[ ] Oracle/PeopleSoft ABM

[ ] SAP

[ ] SAS

[ ] Other - Write In (Required):
_____*

[ ] None

26) To what extent is "customised" ABC software used at your university?*

( ) Not used

( ) Low

( ) Moderate

( ) High

( ) Extremely high use

27) What amount of assistance is received from external consultants in regards to implementing ABC at your university? *

( ) None

( ) Low

( ) Moderate

( ) High

( ) Extremely high

28) Was your ABC data used in cost reduction or process improvement?*

( ) Cost Reduction

( ) Process improvement

( ) Neither

( ) Other - Write In: _____

29) Was your ABC data more accurate than data from the traditional cost system? *

( ) Less accurate

( ) 2

( ) About the same

( ) 4

( ) More accurate

30) Have there been any instances where ABC information changed or altered a management decision?*

[ ] None

[ ] 1 - 2 instances

[ ] 3 - 4 instances

[ ] More than 5 instances

[ ] Can you give an example?: _____

31) Did you feel the ABC information for decision making was worth the cost of implementation? *

( ) Not worth the cost

( ) 2

( ) 3

( ) 4

( ) Absolutely worth the cost

32) Does the ABC information for decision making cause you to want to implement ABC in other areas at your university?

( ) No

( ) Maybe

( ) Yes, we are considering other areas for implementation

( ) We have already begun to implement ABC in other areas

33) Which of the following reasons was the 'main' *motivation* for your university to investigate ABC?*

( ) Australia-wide university initiatives to implement ABC

( ) Many other Australian universities were experimenting or had implemented ABC

( ) Executive management needed better information to base decisions

( ) Schools or departments needed better information to base decisions

( ) Other: _____*

34) Why did your university choose to implement ABC? (Rank your top three: #1, #2, #3 rank)*

_____To improve awareness/understanding of costs

_____Aid in decision making

_____More equitable resource allocation to schools and departments

_____Restructuring schools, departments or activities

_____Identification of duplicated non-value added activities

_____Cost reduction

35) What are the approximate number of activity cost pools or drivers used or proposed in an ABC implementation at your university?*

( ) 1-4

( ) 5-9

( ) 10-19

( ) 20 or more

36) What cost drivers did you identify for *"academic departments"* (Accounting, Management, Economics) or schools as a whole? (Check all that apply)*

[ ] I am not sure

[ ] Number of students

[ ] Number of staff

[ ] EFTSL Equivalent Full Time Student Load

[ ] Space occupied

[ ] Lecture teaching hours or percentage

[ ] Student contact hours

[ ] Number of subjects/units taught

[ ] Library usage statistics

[ ] Number of IT support calls

37) What cost drivers did you identify for *"support department"* costs (administration, HR, purchasing, IT, etc.?) Check all that apply. *

[ ] Number of employees/staff

[ ] Number of students

[ ] Employee hours

[ ] Space occupied

[ ] number of new enrolments

[ ] Number of purchase orders

[ ] Number of invoices processed

[ ] Number of IT support calls

[ ] number of work orders

[ ] I am not sure

38) Costs can be classified into activities based on four general categories: unit-level; batch-level; product-sustaining level, and facility-level activities.
Example: unit-level = subject (ECO101); batch-level = all Economic subjects; product-sustaining may be Master in Economics; facilities-level = overall activities to support building.

In implementing ABC did your applications include the separation of activity pools and drivers using these categories; how many of these categories did your university consider?*

( ) None

( ) 1 category

( ) 2 categories

( ) 3 categories

( ) All 4 categories are used

( ) I do not know

39) How does your University use ABC? (check all that apply)*

[ ] Costing schools

[ ] Costing IT department

[ ] Costing other non-academic service departments

[ ] Costing library

[ ] Costing unit/subjects taught

[ ] Costing research

[ ] Costing administration

[ ] Costing student registration

[ ] Costing student recruitment

[ ] Costing student housing services

[ ] Other: _____*

40) What is the number of <u>academic</u> (schools) or/and <u>University support department</u> (IT, Facilities, Library, etc.) utilising ABC?*

( ) 1 - 2

( ) 3 - 4

( ) 5 or more

( ) I do not know

41) What is the degree of ABC "ownership" by the university administration finance/accounting department? *

( ) Extremely Low

( ) Low

( ) Neutral

( ) High

( ) Extremely High

42) What is the degree of ABC "*ownership*" by various *operating departments* (e.g., facilities/maintenance, IT, purchasing/procurement, HR, Schools, etc.). *

( ) Extremely Low

( ) Low

( ) Neutral

( ) High ( ) Extremely High

43) What is your present level of satisfaction with your existing cost accounting information since you have implemented ABC? *

( ) Very Dissatisfied

( ) Dissatisfied

( ) Neutral

( ) Satisfied

( ) Very Satisfied

44) When was ABC tested or implemented at you university?*

( ) More than 10 years ago

( ) 1-9 years ago

( ) TriaI testing/implementation is presently underway

( ) Other - Write In (Required):
_____*

45) Did you take an active role in the ABC implementation?*

( ) Yes

( ) No

( ) Other - Write In (Required):
_____*

46) Select the approximate *level* or *stage* in which you perceive best applies to the adoption /implementation of ABC at your institution. *

( ) Not considering ABC

( ) initiation – feasibility analysis is done

( ) considered then rejected

( ) adoption – decision to invest some level of resources is made

( ) adaptation – analysis is made of activities and cost drivers, ABC information is avail-able but not yet used by non-accounting staff for decision-making

( ) implemented then abandoned

( ) acceptance – occasionally used by upper management for decision-making, but still considered a project or model

( ) routinization – commonly used by upper management for decision-making and considered a normal part of the information system

( ) infusion/integration – used extensively and fully integrated within the primary financial system

( ) Other - Write In (Required):
_____*

47) What additional questions or topics related to cost and management accounting are important to your organisation or for you professionally? If none, please write "none."*

_____
_____

_____

_____

At the end of this survey, respondents are routed to Separate Questionnaire for Final Questions for Respondents. (See Appendix E)

*** * * * ***

Part 4 Attempters

48) In your attempt to use ABC, what were the objectives of the exercise?*

[ ] Allocate overhead (indirect costs) to schools

[ ] Course delivery decisions

[ ] Program costing (MBA, research programs, bachelor of commerce, masters of music, etc.)

[ ] Other - Write In: _____

49) Did your university perform and exercise or experiment to determine and usefulness of ABC? If so, was the exercise worthwhile? *

( ) Not worthwhile

( ) Possibly worthwhile

( ) Useful but not actioning

( ) Gained better cost knowledge

( ) Useful and actioning

50) Where did any resistance to the adoption/implementation of ABC originate? Check all that apply.*

[ ] No resistance noticed

[ ] Finance/accounting staff

[ ] Departmental Staff (IT, Marketing, Maintenance, etc.)

[ ] Administration Staff

[ ] School teaching staff

[ ] Other - Write In (Required):
_____*

51) What were your primary concerns about *implementing* ABC? Check all that apply.*

[ ] Satisfaction with existing system

[ ] Lack of management support or interest

[ ] The time and cost of doing the exercise

[ ] Lack of perceived benefit

[ ] Lack of time to undertake an assessment of ABC

[ ] Lack of existing staff resources (employee time)

[ ] Lack or shortage of qualified staff

[ ] Difficulty in getting others to understand the methods and co-operate

[ ] Difficulty in carrying out activity analysis

[ ] Difficulty in analysing staff time

[ ] Difficulty in selecting drivers

[ ] Limited usefulness in university setting

[ ] Other - Write In (Required):

_____*

52) What were the most significant reasons given by your university for *not implementing* ABC at the time? Check all that apply.*

[ ] Satisfaction with existing system

[ ] Lack of management support or interest

[ ] The time and cost of doing the exercise

[ ] Lack of perceived benefit

[ ] Lack of time to undertake an assessment of ABC

[ ] Lack of existing staff resources (employee time)

[ ] Lack or shortage of qualified staff

[ ] Difficulty in getting others to understand the methods and co-operate

[ ] Difficulty in carrying out activity analysis

[ ] Difficulty in analysing staff time

[ ] Difficulty in selecting drivers

[ ] Limited usefulness in university setting

[ ] Other - Write In (Required):

_____*

53) Did your exercise, or attempt to implement ABC, give management a better understanding of costs? *

( ) No

( ) 2

( ) Neutral

( ) 4

( ) Yes, better understanding of costs

54) What was the degree of ABC "ownership" by the *administration finance/accounting department*? *

( ) Extremely low

( ) 2

( ) Neutral

( ) 4

( ) Extremely high

55) What was the degree of ABC "ownership" by *various operating departments* (e.g., facilities/maintenance, IT, purchasing/procurement, HR, Schools)? *

( ) Extremely low

( ) 2 ( ) Neutral

( ) 4

( ) Extremely high

56) Is there a formal or informal internal ABC "owner" or "champion" to lead, motivate, and support the implementation and development?*

( ) Yes

( ) No

( ) Other - Write In (Required):
_____*

57) What were you *hoping to accomplish* when you tested ABC?*

[ ] No testing was done

[ ] Broad program costing for teaching versus research

[ ] Allocate overhead to schools

[ ] Product/unit decisions at the level of subjects taught

[ ] Other - Write In: _____

58) Many organisations spend several years adapting their implementation of ABC to fit their decision making needs.
Did your university generate multiple iterations or attempts to develop ABC into a better decision making model [or tool]? *

( ) No

( ) Yes

( ) I am not sure

( ) Other - Write In (Required):
_____*

59) What is your present level of satisfaction with your existing cost accounting information? *

( ) Very Dissatisfied

( ) Dissatisfied

( ) Neutral

( ) Satisfied

( ) Very Satisfied

60) Do you expect to reconsider testing ABC again at your university within the next 5 years? *

( ) Highly unlikely

( ) Unlikely

( ) Neutral

( ) Likely

( ) Highly likely

61) Select the approximate *level* or *stage* in which you perceive best applies to the adoption /implementation of ABC at your institution. *

( ) Not considering ABC

( ) initiation – feasibility analysis is done

( ) considered then rejected

( ) adoption – decision to invest some level of resources is made

( ) adaptation – analysis is made of activities and cost drivers, ABC information is avail-able but not yet used by non-accounting staff for decision-making

( ) implemented then abandoned

( ) acceptance – occasionally used by upper management for decision-making, but still considered a project or model

( ) routinization – commonly used by upper management for decision-making and considered a normal part of the information system

( ) infusion/integration – used extensively and fully integrated within the primary financial system

( ) Other - Write In (Required):
_____*

62) What additional questions or topics related to cost and management accounting are important to your organisation or for you professionally? If none, please write "none."*

_____

_____

At the end of this survey, respondents are routed to Separate Questionnaire for Final Questions for Respondents. (See Appendix E)

*** * * * ***

APPENDIX D: Questionnaire for Universities Who Chose Not To Implement ABC

Part 5 Universities that chose not to implement ABC

63) Did your university experiment with ABC before rejecting the methodology? (Example: a pilot program)*

( ) Yes

( ) No

( ) Other - Write In (Required):
_____*

64) In your university's discussion of ABC, to what degree did the ABC initiative discussion have the support of top management? *

( ) Extremely low

( ) Some support

( ) Moderate support

( ) Good support

( ) Extremely high

65) What were the most significant reasons given by your university *for not implementing* ABC at the time? Check all that apply.*

[ ] Satisfaction with existing system

[ ] Lack of management support or interest

[ ] The time and cost of doing the exercise

[ ] Lack of perceived benefit

[ ] Lack of time to undertake an assessment of ABC

[ ] Lack of existing staff resources (employee time)

[ ] Lack or shortage of qualified staff

[ ] Difficulty in getting others to understand the methods and co-operate

[ ] Difficulty in carrying out activity analysis

[ ] Difficulty in analysing staff time

[ ] Difficulty in selecting drivers

[ ] Limited usefulness in university setting

[ ] Other - Write In (Required):
_____*

66) What amount of assistance was received from external consultants in regards to investigating the use of ABC at your university? *

( ) None

( ) Low

( ) Moderate

( ) High

( ) Extremely high

67) How satisfied is your university with your current overhead cost allocations? *

( ) Very Dissatisfied

( ) Dissatisfied

( ) Neutral

( ) Reasonably satisfied

( ) Very Satisfied

68) Has your university been able to identify unprofitable/underperforming activities using the *existing cost system*?*

( ) Yes

( ) No

( ) Other - Write In (Required):
_____*

69) Does your university believe that ABC is worth implementing in the future? *

( ) Not worthwhile

( ) Possibly worthwhile

( ) Neutral

( ) Useful but not actioning

( ) Useful and actioning

70) Select the approximate *level* or *stage* in which you perceive best applies to the adoption /implementation of ABC at your institution. *

( ) Not considering ABC

( ) initiation – feasibility analysis is done

( ) considered then rejected

( ) adoption – decision to invest some level of resources is made

( ) adaptation – analysis is made of activities and cost drivers, ABC information is avail-able but not yet used by non-accounting staff for decision-making

( ) implemented then abandoned

( ) acceptance – occasionally used by upper management for decision-making, but still considered a project or model

( ) routinization – commonly used by upper management for decision-making and considered a normal part of the information system

( ) infusion/integration – used extensively and fully integrated within the primary financial system

( ) Other - Write In (Required):
_____*

71) What additional questions or topics related to cost and management accounting are important to your organisation or for you professionally? If none, please write "none."*

_____

_____

_____

At the end of this survey, respondents are routed to Separate Questionnaire for Final Questions for Respondents. (See Appendix E)

*** * * * ***

APPENDIX E: Separate Questionnaire for Final Questions for Respondents

If you would like to see the results of this study, please include your name and email address below.

If you would be willing to participate in a one-on-one interview with the researcher to explain in more detail your thoughts on ABC, please check the appropriate box below.
( ) Please email me a copy of the results of this study
( ) I would be willing to participate in a one-on-one interview to further express my views about ABC.

Name: _____
Email address: _____
Contact number: _____
University: _____

Thank You!

* * * * *