

RESEARCHING ACCOUNTING INFORMATION SYSTEM

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ABSTRACT

Revolution of information technology (IT) has changed many aspects of accounting practices, which have resulted in greater demand for IT-literate accountants. From the research perspective, changes to the accounting practices have provided new and exciting research opportunities for accounting information system (AIS) researchers. However, as a relatively young discipline that has just begun to mature, AIS research thus far has provided very limited contribution to the accounting or information system research and practice. Therefore, this paper aims to address issues and the direction of AIS research. More specifically, it discusses the definition, scope, and category of AIS research. This paper ends with several suggestions for the AIS researchers. Among others, AIS researchers need to view AIS in a broader perspective where the impact of technology on all areas of accounting, auditing, and taxation should be considered within the realm of AIS interest. Secondly, AIS researchers have to specialise in at least one other accounting area such as financial reporting, managerial accounting, audit, or taxation, in addition to the AIS domain, to produce high-quality research results. It is hoped that discussions and suggestions brought forward by this paper would initiate and encourage debate among AIS researchers in order to produce high-quality AIS research that can have notable impact on the accounting profession and business practice.

Keywords: *Accounting information systems; accountant; research design.*

Introduction

Information technology (IT) has transformed business practices and now plays a vital part of business strategies (Elliot, 1992; Brecht & Martin, 1996). The advancement of IT has significantly increased the ability of organisations to make good business decisions based on the large amounts of information their enterprise produces (Dillon & Kruck, 2004). Following this, investment in sophisticated IT is now considered fundamental for firms of all sizes to

support, sustain, and grow the business (Ismail & King, 2007). Among other areas of business, accounting is the one facing unprecedented challenges due to the rapid development of IT (Elliot, 2002). Many aspects of accounting practices such as financial reporting, managerial accounting, internal and external auditing, and taxation, have been changed fundamentally by advances in IT (Scapens & Jazayeri, 2003; Chayed & Best, 2005).

More than a decade ago, many accounting professionals and academic accountants argued that the sophistication and complication of IT have changed the nature and design of accounting information system (AIS) (Walker & Denna, 1997). The subsequent impact of these changes is the changing role of an accountant from a traditional bean counter to a decision maker (Brecht & Martin, 1996). Mauldin and Ruchala (1999), for example, claimed that advancement of IT enables users to view modern AIS in a much broader perspective and with added emphasis on the economies of business operations and strategic management. Therefore, the emergence of this knowledge-based economy will no doubt have significant impact on the future role of accounting professionals (Elliot, 2002; Dillon & Kruck, 2004). Greenstein-Prosch and McKee (2004), for instance, argued that rapid technological change, the globalisation effects facilitated by these changes, and the recent large scale business failure such as Enron, Parmalat, and MCI-WorldCom have significant implications on both accounting professionals and academic accountants. Furthermore, the integrated nature of Enterprise Resource Planning Systems (ERPS) widely adopted by medium and large organisations have not only changed the traditional role of management accountants (Caglio, 2003), but has substantial impact on the internal controls of the adopting companies (Sayana, 2004).

Furthermore, the widespread use of IT in organisations has expanded the role of accountants not only in the usage but also in the analysis, design, evaluation, and management of information systems (Chayed & Best, 2005). For example, auditors need to embed technology in everything they do during the audit process (Janvrin, Biesstakes, & Lowe, 2008) similar to the practices of their clients (Winograd, Gerson, & Berlin, 2000) to be effective. Therefore, accounting professionals especially auditors are expected to integrate new and sophisticated technology into their practices to stay relevant (Janvrin et al., 2008). Following this, many scholars have called for more research to investigate the impact of IT on accounting education and practices. Prominent AIS scholars such as Hunton, Sutton, and Arnold have urged accounting research to blend accounting research with information systems to produce AIS research with notable impact on the accounting profession. However, review of AIS literature revealed while much AIS

research had been conducted over the last two decades, AIS researchers are still not clear with the direction of AIS research, thus have contributed little to the understanding and knowledge of AIS (Arnold & Sutton, 2001; Hunton, 2002). Hunton (2002), therefore, called for accounting professionals and academic accountants to work together to understand the significant impact of IT on accounting practices in order to successfully educate and prepare future accountants to work in a complex and rapidly changing environment. This is important as ignoring these changes is like pushing the accounting profession to the sidelines (Ismail, 2003).

This paper aims to discuss specific issues relating to AIS research. The introduction section discusses how the revolution of IT has changed many aspects of accounting practices, and as a result, offers new and exciting research opportunities to accounting professionals and academic accountants. Then, it discusses issues relating to the conflicting definition of AIS, followed by discussions about the scope and types of AIS research. The paper ends with a brief conclusion about the AIS research agenda.

Defining Accounting Information System Research

The first step prior to undertaking AIS research project is to understand the definition of AIS discipline itself. As argued by Arnold and Sutton (2002), the greatest challenge in undertaking any project related to exploring the boundaries and frontiers of AIS research is the inherent difficulty in defining AIS itself as a discipline. Several researchers have attempted to define AIS in the past. However, other researchers within the AIS discipline have questioned each attempt. "Much of the debate revolves around the breadth of a given definition with criticisms ranging from the too narrow to the too broad" (Arnold & Sutton, 2002, p. 3). Nevertheless, these scholars agreed that defining AIS research is a prerequisite to any meaningful discussion of extant and future of AIS research.

McCarthy (1990) provided the earliest definition in terms of a proposition for boundaries of AIS. He noted that "the distinguishing feature of an accounting information system is its involvement in transaction processing for accountability purposes in an organization" (p. vi). Sutton (1992), on the other hand, takes a much broader view of AIS. He argued that while AIS might be usefully perceived as a subset of management information system (MIS) from a teaching standpoint, identifying an area of information system that is not of importance to AIS research is difficult. Sutton (1992) further argued that prior AIS research was influenced by a broad array of accounting research, including (1) how IT can be used to support accounting/

auditing, (2) the implications of IT to the quality of accounting/auditing information, and (3) the evolution of control and auditability of AIS in an IT-based environment. Murthy and Wiggins (1999, p. 3) defined AIS “as the logical intersection of the broad fields of accounting and management information system”, where the connection between the two disciplines comes from computer-based information system that produce information. While both accounting and MIS are focused on information, Murthy and Wiggins argued that accounting is more focused on information itself and MIS on the systems that produce information. To avoid AIS definition that might be limiting, Murthy and Wiggins (1999), similar to Sutton (1992), also proposed that AIS research can expand beyond just the explicit intersection into both accounting and MIS domains.

Hunton (2002) adopted a similar view as McCarthy (1990) where he defined AIS as “a specialized information system aimed at recognizing, measuring, recording, processing, and reporting economic events affecting business entities” (p. 60). He argued that the difference between accounting and information system disciplines centres on the economic implications of business events. Hunton (2002) further noted that while both disciplines investigate similar intra-enterprise issues, the information system discipline is most concerned with the technical aspects of incorporating IT into organisations, whereas the accounting discipline is most interested in leveraging IT to improve business performance while simultaneously maintaining effective internal controls. Arnold and Sutton (2002) take an even broader view of AIS research. They argued that in the evolution of accounting, information system, and AIS, a steady shifting of dominance has occurred. According to them, while information system discipline has initially emerged as a sub-discipline of accounting, it has subsequently grown into a mature and independent discipline in its own right. On the other hand, accounting today is becoming more AIS, a growing sub-discipline in the domain of information system. Therefore, accounting scholars need to learn to research accounting as an information system discipline. As suggested by Arnold and Sutton (2002), all accounting research must address the implications of IT in order to maintain relevance and effectiveness, and ultimately all this research potentially falls under the domains of AIS research.

Scope of Accounting Information System Research

Despite the existence of AIS education more than five decades ago (McMickle, 1989), AIS research is still considered a young discipline that has just begun to mature over the last decade (Hunton, 2002; Sutton, 2004a).

Until recent years, the core of researchers working in the area has been limited and often subject to certain weaknesses. Sutton (1992) identified three major weaknesses in the early works of AIS research. He argued that most of early research lack theoretical basis, focus on descriptive studies of accounting practice, and have limited analysis thus yielding little insight into meaningful relationships. These researches tended to repeat old MIS research studies in the accounting domain but with minimal contribution to the overall information system research and to the evolution of AIS research (Sutton, 1996). Following Sutton's (1996) argument, Hunton (2002) suggested that AIS researchers should blend traditional accounting research with information system research. The reason is that traditional accounting research, via its strong traditions in theory-based work, rigorous statistical methods, and strong analytical skills could lead to a stronger domain that is of higher relevance to the AIS theory and practice. More recently, Sutton (2004b), in his commentary about the role of and need for theory in AIS research, emphasised that AIS research must be well-grounded.

Arnold and Sutton (2002) raised another important issue which is related to the publication of AIS research. They argued that the seminal AIS research is rarely published in traditional accounting journals. Many AIS researchers have published their works in reputable information system journals such as *MIS Quarterly*, *Information Systems Research*, and *Journal of Management Information Systems*. The main reason is lack of AIS publication outlets. Two journals dedicated to AIS research are *International Journal of Accounting Information Systems (IJAIS)* (formerly known as *Advances in Accounting Information Systems – (AiAIS)*) and *Journal of Emerging Technologies in Accounting*. Comprehensive reviews of AIS literature indicates that AIS research has covered a wide range of diverse topics and methodologies over the last two decades. Hutchinson, White, and Daigle (2004) categorised articles that have been published in *AiAIS* and *IJAIS* from 1992 to 2003 into several research topics and issues. Ismail (2009) added to Hutchinson et al. (2004) study by reviewing articles published in *IJAIS* from 2004 to June 2009.

Table 1 presents the topics and issues addressed and the percentage of articles published in each category. The results in Table 1 show that the trend of AIS research has changed from a general to more recent IT issues. For example, topics relating to organisation and management of information system, and judgment and decision making dominate AIS research during the period from 1992 to 2003. However, from 2004 to June 2009, AIS research focused more on topics relating to internal control and auditing, general AIS frameworks, and the Internet. This in tandem with recent technological advancement which emphasised on the security aspects of enterprise systems and the move toward digital and continuous systems.

Table 1

Articles Published in AiAIS and IJAIS by Research Topics (1992 – 2009)

Topics	Issues	1992-2003*		2004-June 2009#	
		No.	Percentage	No.	Percentage
Organisation and Management of an Information System	Issues related to the various stages of the systems development life cycle. Examples include top management involvement in planning, the use of chargeback systems, and evaluating system effectiveness.	27	27%	6	11%
Internal Control and Auditing	Issues related to the design and evaluation of internal controls in information systems, or to the use of various types of audit tools and techniques to provide assurance about information system.	9	9%	12	23%
Judgment and Decision Making	Issues concerning the use of systems and the effects of such use on individual or group decision making.	25	25%	5	10%
Databases	Issues concerning the design and use of databases.	5	5%	2	4%
Expert Systems, Artificial Intelligence, and Decision Aids	Articles that focus on the design of expert systems or other artificial intelligence techniques.	10	10%	2	4%
General Accounting Information System Frameworks	Articles that develop frameworks to address broad accounting information system issues, such as the development of a research paradigm.	15	15%	11	21%
The Accounting and Consulting Profession	Articles that examine career-related issues in accounting and consulting.	0	0%	0	0%
Educational Issues	Articles that address curriculum design issues, describe instructional materials, or present syllabi for specific courses.	8	8%	2	4%
Internet	Issues concerning the use of Internet for business and reporting purposes	0	0%	10	19%
Others	Other recent technology issues such as outsourcing	0	0%	2	4%
TOTAL		99	100%	52	100%

Source: Hutchinson et al. (2004); # Ismail (2009)

Sutton (2005) in his editorial comments about the role of AIS research in guiding practice, argued that the opportunities to provide guidance and impact practice are greater in the area of AIS than any other area of accounting or information system research. He proposed three research areas that should be of interest to AIS researchers. First is the development of eXtensible Business Reporting Language (XBRL) and its potential impact on the financial markets and audit process. The second important research area that relates to the issue of continuous reporting such as XBRL is the efficacy of auditors in auditing continuous audit data. Third is the impact of enterprise systems technology such as ERPS on the control structures, user responsibilities, accounting information processing, and role and decision making patterns of management accountants. More recently, Lee and Moody (2008) highlighted several recent research conducted by AIS researchers which include the impact of outsourcing on stock prices; the alignment between business strategy and IT strategy; the impact of ERPS implementation on stock prices; the cultural implications of ERPS implementation; and privacy protection in data mining. In addition to the diverse research topics, AIS researchers have also adopted various research methodologies. Poston and Grabski (2000) and Hutchinson et al. (2004) identified eight research methods adopted by AIS researchers. The methods are presented in Table 2 below. Survey and case study are two popular methods adopted by AIS researchers (Hutchinson et al., 2004).

Table 2

Research Methods Adopted by AIS Researchers

Methods	Explanation
Survey	Articles that gather data by use of questionnaires.
Experiment	Articles that use lab or field experiments to manipulate independent variables under controlled conditions.
Modelling	Articles that develop data models, economic models, or use analytical techniques to investigate a topic.
Archival	Articles that analyse historical empirical data, usually provided by third-party sources.
Case Study	Articles that examine, in depth, one or a few specific organisations in order to investigate hypothesised relationships or to generate propositions that can be investigated in future research.
Literature Review	Articles that primarily review prior research to propose general frameworks or specific topics for future research.
Descriptive	Articles that describe existing practice. These differ from case studies in that articles in this category do not focus in-depth on the experiences of one or a few specific organisations.
Prescriptive	Articles that develop logical arguments to support proposals for a new or improved way to address some issue.

Types of Accounting Information System Research

The previous section addressed issues relating to the scope and trends of AIS research. This section which discusses the type of AIS research would add understanding and direction of future AIS research. Arnold and Sutton (2002), based on the works of David, Gerard, and McCarthy (n.d.), March and Smith (1995), Sutton and Arnold (1995), and David, Dunn, McCarthy, and Paston (1999), divided AIS research into two categories, i.e. social science (natural/behavioural) research and design science research. According to Arnold and Sutton (2002), social science research framework is a representative of the evolution of more traditional accounting research. Researchers in this domain conduct experimental and field research, evaluate theories, test hypothesis, and perform statistical analysis. Design science perspective, on the other hand, has roots embedded deeply in the domains of computer science and engineering. The design science research activities emphasise on information system construction and software engineering.

Similar to the information system discipline, AIS research has often been caught in the middle of these two sciences. March and Smith (1995), however, emphasised that both design science and natural science activities are needed to advance AIS research. Regardless of whether the research is from a design science or social science perspective, the issue of primary importance is the motivation for pursuing a particular research project (David et al.,). The question of which category to focus on will depend on the academic background of the AIS researcher. Design science, which represents the earliest foundation for quality AIS research, refers to the development of improvements in system concepts, models, design, and development techniques, and system implementation and validation (David et al., 1999). Some domains in accounting research that have been enriched by this methodology include database accounting system, expert system, and object-oriented system. Examples of design science research in the accounting domain includes: relational design of traditional accounting constructs (Everest & Weber, 1977); REA model (McCarthy, 1982; Dunn & McCarthy, 1997); and accounting database design (Chen, O'Leary, & McLead, 1995).

Arnold and Sutton (2002), however, warned AIS researchers about the risk of design-type research. They argued that design science researchers are often infatuated with a technology rather than focusing on the underlying concepts or theories related to design, development, or application of the technology. Arnold and Sutton (2002, p. 8) further noted that "simply building a system does not advance research - rather the question that follows relates to the concept of which proof was being sought". According to David et al., "making only minor design changes or implementing the same elements with a new tool, are development activities rather than

research" (p. 10). Furthermore, this perspective does not provide a good foundation for understanding the impact of IT evolutionary advancements.

The more traditional techniques applied by social scientists, in contrast to design science research, provide a research frame that is more appropriate for establishing theories and testing those theories as they relate to the impact of IT on individuals, organisations, and society, mostly in decision-making contexts (March & Smith, 1995; Sutton & Arnold, 1995). Poston and Grabski (2000) found that underlying theories used in AIS research were borrowed from microeconomic, macroeconomic, statistical, organisational behaviour, organisational strategy, social psychology, cognitive psychology, and computer sciences disciplines. These theories among others, include: contingency theory; organisational information processing theory; technology diffusion theory; knowledge-based theory; task-technology fit theory; technology acceptance model; unified theory of acceptance and use of technology; real options theory; transaction cost economics; agency theory; and resource-based view of the firm.

Similar to the design-type research, behavioural-type research is also subjected to criticisms. Since the extant literature of behavioural AIS research was also drawn from other disciplines such as psychology, sociology, and philosophy, the major criticism for this type of research has been whether it is really AIS research. Others have questioned as to whether they are more likely audit, managerial, or tax research. According to Arnold and Sutton (2002), the answer primarily comes down to how one defines AIS research. They argued that "if a broader view is taken where the impact of technology on all areas of accounting, auditing, and taxation is considered within the realm of accounting information system interest, then virtually all of this research are considered within the scope of accounting information system" (p. 9).

Conclusion

This paper aimed at providing direction for AIS research. To achieve this, this paper addressed issues relating to the definition, scope and also category of AIS research. While the revolution in IT has offered new and exciting challenges and research opportunities, AIS research has provided very limited contribution to accounting or information system research and practice. Most early AIS research was claimed to be descriptive in nature and lack theoretical basis. To increase the variety and quality of AIS research, prominent scholars have called for AIS researchers to view AIS in a broader perspective where the impact of technology on all areas of accounting, auditing, and taxation is considered within the realm of AIS interest. AIS researchers also need to specialise in at least one other area of accounting such

as financial reporting, managerial accounting, audit or taxation, in addition to the AIS domain, and to collaborate with other accounting researchers, where possible, in order to produce high-quality research results that can have notable impact on the accounting profession and business practice. In this so called “global networked economy” where the practice community begins to transform itself into a technology-driven information system profession, little is known about factors impacting information system and business process-oriented audits, information system assurance, e-business success, enterprise information system, quality of continuous financial reporting, and data warehouse applications, among other issues. As the academic community begins to research these areas, equally little is known about theories for interpreting these new phenomena.

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