READINGS AND PROBLEMS IN

ACCOUNTING
INFORMATION
SYSTEMS

Smith | Wiggins | Strawser

Readings and Problems in Accounting Information Systems

L. Murphy Smith, D.B.A., CPA
Associate Professor

Robert H. Strawser, D.B.A., CPA
Arthur Andersen & Co. Former Students Professor

Casper E. Wiggins, Jr., D.B.A., CPA
Associate Professor

All of
Department of Accounting
Texas A&M University

IRWIN

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Accounting Information Systems

DEDICATION

This book is dedicated to Kathy, Carol, and Connie. As stated in Proverbs 12:4, "An excellent wife is the crown of her husband." Anything good we have accomplished is chiefly due to the faithful support and encouragement of our wives.

Introduction

The need to introduce accounting students to computer concepts, as well as to specific computer applications (e.g., spreadsheets), has led many universities to add the Accounting Information Systems (AIS) course to their curriculums. Other universities have integrated the computer-related material within various existing courses. Using either approach, there is much material to be covered. Developments in the AIS area have substantially affected accounting practice and, consequently, accounting education.

The AIS area encompasses many potential topics (e.g., general systems theory, control structure, and specific computer applications). No consensus has been reached on the exact topics that should be covered in the AIS course. A major purpose of this readings and problems book is to provide instructors with a supplement to the basic AIS textbook. The readings may provide coverage of additional topics or more complete coverage of topics included in the basic textbook. This book may also be used stand-alone to provide AIS coverage in a non-AIS course, such as auditing.

The chart inside the cover of this book cross-references the readings and problems chapters in this book with appropriate chapters in six AIS textbooks and two auditing textbooks.

The readings and problems are divided among ten chapters, covering such subjects as controlling the development of information systems, computer crime, and expert systems, among others. Each chapter provides an introduction to the subject matter, which is then addressed by several professional journal articles. Several short problems (discussion questions or short cases) are provided in each chapter. At the end of the book are appendixes on microcomputer spreadsheets and data base software. The appendixes are provided to allow students with little or no knowledge of these software tools to quickly acquire a working knowledge.

Contents in Brief

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CHAPTER 1

The Information Revolution

Being an accounting professional today requires far more than just a textbook understanding of debits and credits, journaling and posting steps, and the latest accounting and auditing pronouncements. The accounting professional of the 1990s must also stay abreast of the many technological advances which continually reshape the business world. These advances have sparked an information revolution which in the past two decades has transformed almost every aspect of accounting. Perhaps the greatest impact of the information revolution has been on the accounting system itself; indeed, accounting systems and the world of computers and data processing have become inseparable. Recognition of this fact has given rise to a new accounting specialty area known as accounting information systems.

Most accounting information systems (AIS) today involve elements of computer processing, and the complexity of computer processing is steadily increasing. For example, in the 1960s the early computers enabled many organizations to replace manual systems with batch processing systems. As equipment costs declined in the 1970s, many of these early batch systems were displaced by more complex on-line systems, some with real-time and/or data base applications. The advent of microcomputers and continuing reductions in overall equipment costs in the 1980s made computer processing affordable to almost all businesses. Today, real-time applications, data base applications, computer networks, electronic data interchange (EDI), and many other sophisticated features are becoming commonplace in accounting information systems.

Such technology permits, for example, the rapid processing of huge volumes of transactions, the immediate updating of on-line files, point-of-sale (POS) transaction entry, rapid access to data in integrated data bases, instantaneous data communications within geographically distributed computer networks, and an increased level of computer resource sharing. To a decision maker this translates into more accurate, reliable, and timely information to support tough economic decisions made in an ever more competitive environment. This enhances planning and control at all organizational levels and for all aspects of business activity.

This technological revolution has also produced radical changes in the design and manufacturing activities of many businesses. For example, computer-aided drafting, design, and manufacturing (CAD/CAM technology)

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has totally restructured the drafting, design, and manufacturing industries. CAD/CAM has virtually eliminated the iterative manual drafting process and has dramatically reduced the labor hours required for the design of new automobiles, aircraft, buildings, factories, and many other products. Complete material and labor cost schedules are also automatically produced from computer designs. Thus, CAD/CAM technology both automates and integrates design, manufacturing, and production processes. Benefits include significant gains in productivity and savings in cost, as well as a shortening of the design, development, and production cycles. In addition, related technologies permit the real-time monitoring of manufacturing processes, reducing labor and waste costs and greatly enhancing quality control.

Advancing technology also has significant implications for the auditors of these ever more complex systems. Gone are the traditional paper audit trails which auditors can easily follow. Instead of the customary segregation of duties, auditors find that duties have been concentrated in computer programs. Files of information once stored conveniently in file cabinets now reside in computer files which cannot be read by humans. Indeed, the information revolution has created an unfamiliar and imposing audit environment for auditors. Fortunately, the profession has responded to this challenge and has developed new tools and techniques for auditing in computer environments. However, as technology continues to change, so also must audit technology and strategies.

The three readings included in this chapter establish a framework for the remaining topics of this text by exploring both present and future implications of the information revolution for the accounting profession. The initial article, "Commentary on Information Systems," by Gordon B. Davis, describes the intimate relationship which exists today between information systems and the accounting profession. Professor Davis's comments underscore the critical importance of accounting information systems knowledge in basic education as well as in continuing education for accounting professionals.

The second article, "The Corporate Financial Planning Workstation and Software Tools," provides an overview of the corporate financial planning philosophy, the computing environment, and some appropriate computer software tools. The chapter's final article, "The CPA in the Information Age: Today and Tomorrow," surveys the emerging technologies which are reshaping the public accounting profession, and presents a glimpse of an audit system of the future.

CHAPTER 1 READINGS

1. Gordon B. Davis, "Commentary on Information Systems," *Accounting Horizons,* March 1987, pp. 75–79.
2. L. Murphy Smith and James A. Sena, "The Corporate Financial Planning Workstation and Software Tools," *Journal of Accounting and EDP,* Fall 1989, pp. 48–56.

3. Robert S. Roussey, "The CPA in the Information Age: Today and Tomorrow," *Journal of Accountancy,* October 1986, pp. 94–107.

CHAPTER 1 QUESTIONS

Article 1

1. Describe the roles often provided by accounting professionals which suggest a strong affinity between accounting and information systems. Why is it advisable for an accountant to be involved with systems developers in the design and testing of new applications?

Article 2

2. What are the key levels of planning?
3. List personal software tools.
4. List the software tools used for managerial processing and comprehensive analysis.

Article 3

5. Which aspects of the audit process are most adaptable to and benefit most from automation? Why are benefits (productivity gains) from audit automation somewhat difficult to measure?
6. What are the implications of audit automation for: (*a*) auditors; (*b*) their clients? Some say that auditing will never be the same. Do you agree?
7. How has the role of accounting changed in the information age? Will trained accountants still be needed in 10 years? Are accountants the primary purveyors of information in today's business world?

General

8. What is CAD/CAM technology? In what ways has this new technology increased productivity in manufacturing industries such as the automobile industry?
9. How can the value of information be measured? What are some of the costs and benefits of information to a typical business? Are the costs of information easier or more difficult to assess than the value of information?

Case 1–1

GREASY BBQ

The Greasy BBQ has served Casper, Wyoming, customers for over two decades and has gained a reputation for its truly fine BBQ. The specialty of the house is fajitas marinated in a special sauce which, according to the owner, Fred Frijole, attracts customers "from as far away as Mexico." While business has been steadily increasing, Fred is very concerned because the BBQ's profits do not seem to be increasing.

Fred fears that his accounting system may be inadequate, especially in the area of control structure. Fred's cousin Joe Bob made a C − on his first test in high school accounting and was the natural choice to set up the BBQ's accounting system. The BBQ operates on a cash basis because Joe Bob left high school before "they got to the accrual basis." Besides, in Joe Bob's opinion, "We're all in it for the cash anyway." Joe Bob also does the books for the BBQ during the rodeo off-season. Fred cannot reach Joe Bob now, since it is rodeo season, and he has called you in for help since he heard that you are taking accounting information systems in college. Fred is particularly interested in improving his accounting system, increasing profits, and learning more about effective control structure. He is also concerned that the IRS might criticize his accounting system should the BBQ ever be audited. This was not a worry in the past because Fred just filed the BBQ's first-ever tax return last month.

Customers enjoy a casual atmosphere at the Greasy BBQ, which operates as follows. Customers enter the front door and select one of the 20 tables or 12 booths, and seat themselves. Menus are painted on signs posted on each wall so that a menu is always in sight. One of the six waiters or waitresses, all of whom are students at the local university, quickly takes customers' orders on a plain white order pad. The table number is marked on each order before it is taken to the kitchen.

The three cooks, also university students, then fill the orders, always giving generous portions. (The BBQ is cooked slowly the night before by a university student who is also responsible for cleaning the restaurant.) When the table order is ready, one of the cooks will holler out, and the first available waiter or waitress will serve the food to the appropriate table. All orders are served on butcher paper which adds to the homey atmosphere and virtually eliminates dishwashing. When customers are finished with their meal they go to the cashier stand located at the back of the restaurant, tell Fred what they had, and pay accordingly. Part of the atmosphere of the BBQ is the 1875 cash drawer which is still in daily use.

Fred is very proud that the BBQ has operated on the honor system successfully for all these years. Many of his best customers are university students and truckers, and in Fred's opinion, "if you can't trust your customers, who can you trust?" He always takes checks from his customers and does not worry about bad checks because "all my meals are cheap and, besides, the bank takes care of bad checks, that's their job."

Fred also orders all of the meat and the other items used in the restaurant. His orders are based on his many years of experience, the season of the year, and the day of the week. He feels this "seat of the pants" method works well for the BBQ

and brags that he has never run out of food to serve his customers. In addition, he believes the amount of wasted food is not excessive. Leftover food is regularly sold to a local kennel and feed ranch.

REQUIRED

1. What are the likely causes of the BBQ's "lean" profits?

2. Identify any weaknesses noted in Greasy's accounting system which may contribute to a loss of profits.

3. What improvements might you suggest to overcome any of the weaknesses cited above?

4. Should the BBQ convert from the cash to the accrual basis? What are the pros and cons?

5. What information might Fred utilize in order to better manage the BBQ? How might the accounting information system be modified to generate this management information?

Case 1–2

AQUALUNG, INC.

John Arend, President of Aqualung, Inc., a small Miami-based underwater construction and marine salvage company, sat back in his chair and pondered an investment opportunity which had unexpectedly presented itself. Earlier in the week, John had received a telephone call from Mike Brown, a former college fraternity brother, who wanted to discuss a possible business venture. Over lunch the next day, John learned that Mike was organizing a group of investors to finance a search for the wreck of a Spanish galleon, the *Toledo*, which sank off the coast of Bermuda during the 18th century. The *Toledo* had been carrying gold and silver bullion mined in Mexico, none of which had ever been recovered. Mike had contacted John because of his expertise in underwater salvage work. Aqualung's investment would consist of providing a boat, several teams of divers, and their equipment. Other investors would provide the working capital and specialized knowledge needed for day-to-day operations.

As John considered Brown's proposition, he realized that he needed additional quantitative information regarding the risk/return trade-off that the investment offered. To this end he scheduled a meeting the next afternoon with Mike Brown. John asked you, Aqualung's controller, to join him at the meeting. During the meeting, Mike informed John that his best estimate of Aqualung's share of the search costs was $1.5 million. Mike also estimated that the probability of finding the *Toledo* and recovering the majority of the bullion before the hurricane season began was only 20 percent. However, since gold prices were at an all-time high due to strong inflation in the world economy, a successful search should result in a net gain to Aqualung of approximately $8 million. The probability that the venture would be a failure was 80 percent.

REQUIRED:

a. Summarize Mike's cost and probability estimates in a decision tree and calculate the expected values of John's alternatives regarding the investment.

b. John notes that because the net expected value of the decision to invest is higher than that of not investing, the best decision, based on the available information, might be to invest. However, he still hesitates because of the high probability and cost of failure. While John realizes, of course, that perfect information as to the existence of underwater treasure is not available, he asks you to calculate the net expected value of the venture, given perfect information (i.e., John would know for certain in advance whether treasure existed or not). In other words, you are to determine how much John would be willing to pay for perfect information.

Reading 1-1

COMMENTARY ON INFORMATION SYSTEMS

By Gordon B. Davis

Should every accountant be a computer expert? Is it reasonable to expect that a "normal" person can be a good accountant and a computer-based information processing expert as well? If the answer is "not an expert," there still remains a need for accountants to have a fairly good understanding of computers and information systems. But what does this mean in terms of basic education and continuing professional education? This column will describe some of the differences and affinities that characterize the relationship of accounting and information systems. With this background (and a definition of information systems), three computer and information system literacies vital to professional accountants will be explained. These literacies provide a basis for being an accountant with adequate skills in information systems without taking on the requirement of being an expert.

ACCOUNTANTS AND INFORMATION PROCESSING SYSTEMS WORK

The world was simpler for accountants before there were computers. In the olden days, accountants needed to understand the bookkeeping systems that processed the transactions and maintained the accounting files, but that was

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rarely a problem. The bookkeeping files were visible, the procedures were observable from start to finish (and in any case, there was a person there to explain what they did), and there tended to be very little change from one period to the next.

Accounting systems topics were rarely taught to accountants, and if the subject was taught, it was not considered to be a subject that excited the intellect. Committees of the American Accounting Association regularly indicated the importance of accounting systems as a topic for instruction, but it failed the market test, and accountants learned about accounting systems "on the job."

Until the advent of computers, accounting provided *the* formal financial information systems for organizations. When computers were applied to information processing in organizations, starting in about 1954, it seemed very natural for computer data processing systems to be incorporated in the domain of accounting, both organizationally and academically. Sometimes it happened, but frequently it did not.

A new function, *data processing* or *information systems,* arose to manage the technology of information processing. Why did this happen? Three major reasons that information systems did not remain a simple subfield of accounting (as an expanded accounting systems function) are the demands of a changing technology, new development methods, and specialization.

- Computer technology for information processing has been changing at such a pace that it requires significant ongoing effort to maintain real expertise.
- The development methodologies for information systems (requirements determination, development, design, and implementation) use techniques that are new or are significantly changed from past accounting systems development methods.
- Specialization in computer-based information processing has provided the basis for a new professional identity. Many of the people with this professional identification have little background in accounting and do not identify with it.

DEFINITION OF INFORMATION SYSTEMS

Many accountants equate information systems with computers, but when the field is viewed more broadly, the relationship to accounting becomes more significant. Information systems as a business function can be termed data processing, management information systems, information systems, etc. For the purposes of this article, "information systems" will be used to refer to both the organizational function and its related professional and academic fields. Information systems is defined as the function that performs the design, construction, and maintenance of human/machine systems that